The Parma Polyhedra Library Configured OCaml Language Interface User's Manual[*] (version 0.11.2)

Roberto Bagnara[†]
Patricia M. Hill[‡]
Enea Zaffanella[§]

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[†]bagnara@cs.unipr.it, Department of Mathematics, University of Parma, Italy.
[‡]hill@comp.leeds.ac.uk, School of Computing, University of Leeds, U.K.
[§]zaffanella@cs.unipr.it, Department of Mathematics, University of Parma, Italy.

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http://www.cs.unipr.it/ppl/

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1 OCaml Language Interface

The Parma Polyhedra Library comes equipped with an interface for the OCaml language.

The main features of the library are described in Section OCaml Interface Features. Section OCamldoc Documentation lists all the functions available to the default generated domains in the OCaml interface. Section Compilation and Installation explains how the OCaml interface is compiled and installed.

In the sequel, `prefix` is the prefix under which you have installed the library (typically `/usr` or `/usr/local`).

OCaml Interface Features

The OCaml interface provides access to the numerical abstractions (convex polyhedra, BD shapes, octagonal shapes, etc.) implemented by the PPL library. A general introduction to the numerical abstractions, their representation in the PPL and the operations provided by the PPL is given in the main *PPL user manual*. Here we just describe those aspects that are specific to the OCaml interface.

Overview

First, here is a list of notes with general information and advice on the use of the OCaml interface.

- The numerical abstract domains available to the OCaml user consist of the *simple* domains, *powersets* of a simple domain and *products* of simple domains.
  - The simple domains are:
    - convex polyhedra, which consist of C_Polyhedron and NNC_Polyhedron;
    - weakly relational, which consist of BD_Shape_N and Octagonal_Shape_N where N is one of the numeric types short, signed_char, int, long, long_long, mpz_class, mpq_class;
    - boxes which consist of Int8_Box, Int16_Box, Int32_Box, Int64_Box, Uint8_Box, Uint16_Box, Uint32_Box, Uint64_Box, Double_Box, Long_Double_Box, Z_Box, Rational_Box, Float_Box; and
    - the Grid domain.
  - The powerset domains are Pointset_Powerset_S where S is a simple domain.
  - The product domains consist of Direct_Product_S_T, Smash_Product_S_T and Constraints_-Product_S_T where S and T are simple domains.
- In the following, any of the above numerical abstract domains is called a PPL *domain* and any element of a PPL domain is called a *PPL object*.
- The OCaml interface files are all installed in the directory `prefix/lib/ppl`. Since this includes shared and dynamically loaded libraries, you must make your dynamic linker/loader aware of this fact. If you use a GNU/Linux system, try the commands `man ld.so` and `man ldconfig` for more information.
- A PPL object such as a polyhedron can only be accessed by means of a OCaml term called a *handle*. Note, however, that the data structure of a handle, is implementation-dependent, system-dependent and version-dependent, and, for this reason, deliberately left unspecified. What we do guarantee is that the handle requires very little memory.
- An OCaml program can obtain a valid handle for a PPL object by using functions such as

  ```
  ppl_new_C_Polyhedron_from_space_dimension,
  ppl_new_C_Polyhedron_from_C_Polyhedron,
  ppl_new_C_Polyhedron_from_constraints,
  ppl_new_C_Polyhedron_from_generators.
  ```

  These functions will return a new handle for referencing a PPL polyhedron.
- For a PPL object with space dimension `k`, the identifiers used for the PPL variables must lie between 0 and $k-1$ and correspond to the indices of the associated Cartesian axes. For example, when using the functions that combine PPL polyhedra or add constraints or generators to a representation of a PPL polyhedron, the polyhedra referenced and any constraints or generators in the call should follow all the (space) dimension-compatibility rules stated in Section *Representations of Convex Polyhedra* of the main PPL user manual.

- As explained above, a polyhedron has a fixed topology C or NNC, that is determined at the time of its initialization. All subsequent operations on the polyhedron must respect all the topological compatibility rules stated in Section *Representations of Convex Polyhedra* of the main PPL user manual.
- Any application using the PPL should make sure that only the intended version(s) of the library are ever used. Functions

```
ppl_version_major,
ppl_version_minor,
ppl_version_revision,
ppl_version_beta,
ppl_version,
ppl_banner.
```

  allow run-time checking of information about the version being used.

Function Descriptions

Below is a short description of many of the interface functions. For full definitions of terminology used here, see the main PPL user manual.

Domain Independent Functions

First we describe some domain independent functions included with all instantiations of the OCaml interfaces.

`ppl_version_major`

Returns the major number of the PPL version.

`ppl_version_minor`

Returns the minor number of the PPL version.

`ppl_version_revision`

Returns the revision number of the PPL version.

`ppl_version_beta`

Returns the beta number of the PPL version.

`ppl_version`

Returns the PPL version.

ppl_banner

Returns information about the PPL version, the licensing, the lack of any warranty whatsoever, the C++ compiler used to build the library, where to report bugs and where to look for further information.

ppl_max_space_dimension

Returns the maximum space dimension the C++ interface can handle.

ppl_Coefficient_bits

Returns the number of bits used in the C++ interface for PPL coefficients; 0 if unbounded.

ppl_Coefficient_is_bounded

Returns true if and only if the coefficients in the C++ interface are bounded.

ppl_Coefficient_max

If the coefficients are bounded, returns the maximum coefficient the C++ interface can handle.

ppl_Coefficient_min

If the coefficients are bounded, returns the minimum coefficient the C++ interface can handle.

ppl_io_wrap_string source_string indent_depth preferred_first_line_length preferred_line_length

Utility function for the wrapping of lines of text. The function wraps the lines of text stored in its first string argument according to the next three integer arguments, which are interpreted as the indentation depth, the preferred length for the first line and the preferred length for all the other lines, respecively; it returns a string containing the wrapped text.

ppl_set_timeout hsecs

Computations taking exponential time will be interrupted some time after `hsecs` hundreths of seconds after that call. If the computation is interrupted that way, a timeout exception will be thrown. An exception is immediately thrown if `hsecs` is not strictly greater than zero, or if the PPL Watchdog library is not enabled.

ppl_reset_timeout

Resets the timeout time so that the computation is not interrupted. An exception is thrown if the PPL Watchdog library is not enabled.

ppl_set_deterministic_timeout weight

Computations taking exponential time will be interrupted some time after reaching the `weight` complexity threshold. If the computation is interrupted that way, a timeout exception will be thrown. An exception is immediately thrown if `hsecs` is not strictly greater than zero, or if the PPL Watchdog library is not enabled. *NOTE:* This "timeout" checking functionality is said to be *deterministic* because it is not based on actual elapsed time. Its behavior will only depend on (some of the) computations performed in the PPL library and it will be otherwise independent from the computation environment (CPU, operating system, compiler, etc.). The weight mechanism is under alpha testing: client applications should be ready to reconsider the tuning of these weight thresholds when upgrading to newer version of the PPL.

ppl_reset_deterministic_timeout

Resets the timeout time so that the computation is not interrupted. An exception is thrown if the PPL Watchdog library is not enabled.

ppl_set_rounding_for_PPL

Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly. This is performed automatically at initialization-time. Calling this function is needed only if `restore_pre_PPL_rounding` has previously been called.

ppl_restore_pre_PPL_rounding

Sets the FPU rounding mode as it was before initialization of the PPL. After calling this function it is absolutely necessary to call `set_rounding_for_PPL` before using any PPL abstractions based on floating point numbers. This is performed automatically at finalization-time.

ppl_irrational_precision

Returns the precision parameter for irrational calculations.

ppl_set_irrational_precision

Sets the precision parameter `p` for irrational calculations. In the following irrational calculations returning an unbounded rational (e.g., when computing a square root), the lesser between numerator and denominator will be limited to `2**p`.

MIP Functions

Here we describe some functions available for PPL objects defining mixed integer (linear) programming problems.

ppl_new_MIP_Problem_from_space_dimension dimension

Return a handle to an MIP Problem MIP with the feasible region the vector space of dimension `dimension`, objective function 0 and optimization mode `max`.

ppl_new_MIP_Problem dimension constraint_system lin_expr optimization_mode

Return a handle to an MIP Problem MIP having space dimension `dimension`, a feasible region represented by `constraint_system`, objective function `lin_expr` and optimization mode `optimization_mode`.

ppl_MIP_Problem_get_control_parameter handle param_name

Returns the value of the control parameter named `param_name`.

ppl_MIP_Problem_set_control_parameter handle param_value

Sets control parameter value `param_value`.

ppl_MIP_Problem_swap handle_1 handle_2

Swaps the MIP Problem referenced by `handle_1` with the one referenced by `handle_2`.

ppl_MIP_Problem_space_dimension handle

Returns the dimension of the vector space in which the MIP Problem referenced by `handle` is embedded.

ppl_MIP_Problem_integer_space_dimensions handle

Returns a list of variables representing representing the integer space dimensions of the MIP Problem referenced by `handle`.

ppl_MIP_Problem_constraints handle

Returns a list of the constraints in the constraints system representing the feasible region for the MIP Problem referenced by `handle`.

ppl_MIP_Problem_objective_function handle

Returns the objective function for the MIP Problem referenced by `handle`.

ppl_MIP_Problem_optimization_mode handle

Returns the optimization mode for the MIP Problem referenced by `handle`.

ppl_MIP_Problem_clear handle

Resets the MIP problem referenced by `handle` to be the trivial problem with the feasible region the 0-dimensional universe, objective function 0 and optimization mode `Maximization`.

ppl_MIP_Problem_add_space_dimensions_and_embed handle dimension

Embeds the MIP problem referenced by `handle` in a space that is enlarged by `dimension` dimensions,

ppl_MIP_Problem_add_to_integer_space_dimensions handle vars_list

Updates the MIP Problem referenced by `handle` so that the variables in `vars_list` are added to the set of integer space dimensions.

ppl_MIP_Problem_add_constraint handle constraint

Updates the MIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with the constraint `constraint`.

ppl_MIP_Problem_add_constraints handle constraint_system

Updates the MIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with all the constraints in `constraint_system`.

ppl_MIP_Problem_set_objective_function handle lin_expr

Updates the MIP Problem referenced by `handle` so that the objective function is changed to `lin_expr`.

ppl_MIP_Problem_set_optimization_mode handle optimization_mode

Updates the MIP Problem referenced by `handle` so that the optimization mode is changed to `optimization_mode`.

ppl_MIP_Problem_is_satisfiable handle

Returns true if the MIP Problem referenced by `handle` is satisfiable and false otherwise.

ppl_MIP_Problem_solve handle

Solves the MIP problem referenced by `handle` and returns 0, if the MIP problem is not satisfiable; 1, if the MIP problem is satisfiable but there is no finite bound to the value of the objective function; 2, if the MIP problem admits an optimal solution.

ppl_MIP_Problem_feasible_point handle

Returns a feasible point for the MIP problem referenced by `handle`.

ppl_MIP_Problem_optimizing_point handle

Returns an optimizing point for the MIP problem referenced by `handle`.

ppl_MIP_Problem_optimal_value handle

Returns a pair of numbers, the first being the numerator and the second the denominator, for the optimal value for the MIP problem referenced by `handle`.

ppl_MIP_Problem_evaluate_objective_function handle generator

Evaluates the objective function of the MIP problem referenced by `handle` at point `generator`. Returns a pair of numbers, the first being the numerator and the second the denominator, for the objective function value for the MIP problem referenced by `handle`.

ppl_MIP_Problem_OK handle

Returns true if the MIP Problem referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_MIP_Problem_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the MIP_Problem referenced by `handle`. Useful for debugging purposes.

PIP Functions

Here we describe some functions available for PPL objects defining parametric integer programming problems.

ppl_new_PIP_Problem_from_space_dimension dimension

Return a handle to a PIP Problem PIP with the feasible region the vector space of dimension `dimension`, empty constraint_system and empty set of parametric variables.

ppl_new_PIP_Problem dimension constraint_system vars_list

Return a handle to a PIP Problem PIP having space dimension `dimension`, a feasible region represented by `constraint_system` and parametric variables represented by `vars_list`.

ppl_PIP_Problem_get_control_parameter handle param_name

Returns the value of the control parameter named `param_name`.

ppl_PIP_Problem_set_control_parameter handle param_value

Sets control parameter value `param_value`.

ppl_PIP_Problem_swap handle_1 handle_2

Swaps the PIP Problem referenced by `handle_1` with the one referenced by `handle_2`.

ppl_PIP_Problem_space_dimension handle

Returns the dimension of the vector space in which the PIP Problem referenced by `handle` is embedded.

ppl_PIP_Problem_parameter_space_dimensions handle

Returns a list of variables representing representing the parameter space dimensions of the PIP Problem referenced by `handle`.

ppl_PIP_Problem_constraints handle

Returns a list of the constraints in the constraints system representing the feasible region for the PIP Problem referenced by `handle`.

ppl_PIP_Problem_clear handle

Resets the PIP problem referenced by `handle` to be the trivial problem with space dimension 0.

ppl_PIP_Problem_add_space_dimensions_and_embed handle dimension_0 dimension_1

Embeds the PIP problem referenced by `handle` in a space that is enlarged by `dimension_0` non-parameter dimensions and `dimension_1` parameter dimensions,

ppl_PIP_Problem_add_to_parameter_space_dimensions handle vars_list

Sets the space dimensions whose indexes are in `vars_list` to be parameter space dimensions.

ppl_PIP_Problem_add_constraint handle constraint

Updates the PIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with the constraint `constraint`.

ppl_PIP_Problem_add_constraints handle constraint_system

Updates the PIP Problem referenced by `handle` so that the feasible region is represented by the original constraint system together with all the constraints in `constraint_system`.

ppl_PIP_Problem_set_big_parameter_dimension handle dimension

Sets the dimension for the big parameter to `dimension`.

ppl_PIP_Problem_get_big_parameter_dimension handle

Returns the dimension for the big parameter. Exception is thrown if no big parameter dimension has been set.

ppl_PIP_Problem_has_big_parameter_dimension handle

Returns true if and only if the dimension for the big parameter has been set.

ppl_PIP_Problem_is_satisfiable handle

Returns true if the PIP Problem referenced by `handle` is satisfiable and false otherwise.

ppl_PIP_Problem_solve handle

Solves the PIP problem referenced by `handle` and returns a status flag indicating the outcome of the optimization attempt: `Optimized_Pip_Problem` if the optimization attempt succeeds; `Unfeasible_Pip_Problem` otherwise.

ppl_PIP_Problem_solution handle

Solves the PIP problem referenced by `handle` and returns a handle to a PIP_Tree representing a feasible solution, if it exists and bottom otherwise.

ppl_PIP_Problem_optimizing_solution handle

Solves the PIP problem referenced by `handle` and returns a handle to a PIP_Tree representing an optimizing_solution, if it exists and bottom otherwise.

ppl_PIP_Problem_OK handle

Returns true if the PIP Problem referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_PIP_Problem_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the PIP_Problem referenced by `handle`. Useful for debugging purposes.

ppl_PIP_Tree_Node_swap handle_1 handle_2

Swaps the PIP tree node referenced by `handle_1` with the one referenced by `handle_2`.

ppl_PIP_Tree_Node_OK handle

Returns true if the PIP tree node referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_PIP_Tree_Node_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the Pip tree node referenced by `handle`. Useful for debugging purposes.

ppl_PIP_Tree_Node_constraints handle

Returns a list of the parameter constraints in the PIP tree node referenced by `handle`.

ppl_PIP_Tree_Node_artificials handle

Returns a list of the artificial parameters in the PIP tree node referenced by `handle`.

ppl_PIP_Tree_Node_is_bottom handle

Returns true if and only if `handle` represents bottom.

ppl_PIP_Tree_Node_is_decision handle

Returns true if and only if `handle` represents a decision node.

ppl_PIP_Tree_Node_is_solution handle

Returns true if and only if `handle` represents a solution node.

ppl_PIP_Tree_Node_parametric_values handle var

Returns a linear expression representing the values of problem variable `var` in the solution node represented by `handle`. The returned linear expression may involve problem parameters as well as artificial parameters.

ppl_PIP_Tree_Node_true_child handle var

Returns a handle to the child on the true branch of the PIP tree node represented by `handle`.

ppl_PIP_Tree_Node_false_child handle var

Returns a handle to the child on the false branch of the PIP tree node represented by `handle`.

C_Polyhedron Functions

Here we describe the main functions available for PPL objects defining convex and closed polyhedra.

ppl_new_C_Polyhedron_from_space_dimension space_dimension universe_or_empty

Returns a handle to a C polyhedron $\mathcal{P}$ with `space_dimension` dimensions; it is empty or the universe polyhedron depending on whether `universe_or_empty` is `empty` or `universe`, respectively.

ppl_new_C_Polyhedron_from_C_Polyhedron handle

If `handle` refers to a C polyhedron $\mathcal{P}_1$, then the expression will returns a handle to a copy $\mathcal{P}_2$ of $\mathcal{P}_1$.

ppl_new_C_Polyhedron_from_NNC_Polyhedron handle

If `handle` refers to an NNC polyhedron $\mathcal{P}_1$, then the expression returns a handle to a copy $\mathcal{P}_2$ of $\mathcal{P}_1$.

When using `ppl_new_C_Polyhedron_from_NNC_Polyhedron/2`, care must be taken that the source polyhedron referenced by `handle` is topologically closed.

ppl_new_C_Polyhedron_from_constraints constraint_system

Returns a handle to a C polyhedron $\mathcal{P}$ represented by `constraint_system`.

ppl_new_C_Polyhedron_from_generators generator_system

Returns a handle to a C polyhedron $\mathcal{P}$ represented by `generator_system`.

ppl_Polyhedron_swap handle_1 handle_2

Swaps the polyhedron $\mathcal{P}$ referenced by `handle_1` with the polyhedron $\mathcal{Q}$ referenced by `handle_2`. The polyhedra $\mathcal{P}$ and $\mathcal{Q}$ must have the same topology.

ppl_Polyhedron_space_dimension handle

Returns the dimension of the vector space in which the polyhedron referenced by `handle` is embedded.

ppl_Polyhedron_affine_dimension handle

Returns the actual dimension of the polyhedron referenced by `handle`.

ppl_Polyhedron_get_constraints handle

Return a list of the constraints in the constraints system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_get_minimized_constraints handle

Returns a minimized list of the constraints in the constraints system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_get_generators handle

Returns a list of the generators in the generators system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_get_minimized_generators handle

Returns a minimized list of the generators in the generators system representing the polyhedron referenced by `handle`.

ppl_Polyhedron_relation_with_constraint handle constraint

Returns the list of relations the polyhedron referenced by `handle` has with `constraint`. The possible relations and their meaning is given in Section *Relation-With Operators* of the main PPL user manual.

ppl_Polyhedron_relation_with_generator handle generator

Returns the list of relations the polyhedron referenced by `handle` has with `generator`. The possible relations and their meaning is given in Section *Relation-With Operators* of the main PPL user manual.

ppl_Polyhedron_is_empty handle

Returns true if the polyhedron referenced by `handle` is empty and false, otherwise.

ppl_Polyhedron_is_universe handle

Returns true if the polyhedron referenced by `handle` is the universe and false, otherwise.

ppl_Polyhedron_is_bounded handle

Returns true if the polyhedron referenced by `handle` is bounded and false, otherwise.

ppl_Polyhedron_contains_integer_point handle

Returns true if the polyhedron referenced by `handle` contains at least one integer point and false, otherwise.

ppl_Polyhedron_bounds_from_above handle lin_expr

Returns true if the polyhedron referenced by `handle` is bounded from above by `lin_expr` and false, otherwise.

ppl_Polyhedron_bounds_from_below handle lin_expr

Returns true if the polyhedron referenced by `handle` is bounded from below by `lin_expr` and false, otherwise.

ppl_Polyhedron_maximize handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2` where: `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from above in P and false, otherwise. `coefficient_1` is the numerator of the supremum value and `coefficient_2` the denominator of the supremum value. If the supremum is also the maximum, `bool_2` is true and false, otherwise.

ppl_Polyhedron_maximize_with_point handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2 * Point` `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from above in P and false, otherwise. `coefficient_1` is the numerator of the supremum value and `coefficient_2` the denominator of the supremum value. If the supremum is also the maximum, `bool_2` is true and false, otherwise. `Point` is the point or closure point where `lin_expr` reaches the supremum.

ppl_Polyhedron_minimize handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2` `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from below in P and false, otherwise. `coefficient_1` is the numerator of the infinum value and `coefficient_2` the denominator of the infinum value. If the infinum is also the minimum, `bool_2` is true and false, otherwise.

ppl_Polyhedron_minimize_with_point handle lin_expr

Returns a record `bool_1 * coefficient_1 * coefficient_2 * bool_2` `bool_1` is true if the polyhedron P referenced by `handle` is not empty and `lin_expr` is bounded from below in P and false, otherwise. `coefficient_1` is the numerator of the infinum value and `coefficient_2` the denominator of the infinum value. If the infinum is also the minimum, `bool_2` is true and false, otherwise. `Point` is the point or closure point where `lin_expr` reaches the infinum.

ppl_Polyhedron_is_topologically_closed handle

Returns true if the polyhedron referenced by `handle` is topologically closed and false, otherwise.

ppl_Polyhedron_contains_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_2` is included in or equal to the polyhedron referenced by `handle_1` and false, otherwise.

ppl_Polyhedron_strictly_contains_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_2` is included in but not equal to the polyhedron referenced by `handle_1` and false, otherwise.

ppl_Polyhedron_is_disjoint_from_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_1` is disjoint from the polyhedron referenced by `handle_2` and false, otherwise.

ppl_Polyhedron_equals_Polyhedron handle_1 handle_2

Returns true if the polyhedron referenced by `handle_1` is equal to the polyhedron referenced by `handle_2` and false, otherwise.

ppl_Polyhedron_OK handle

Returns true if the polyhedron referenced by `handle` is well formed, i.e., if it satisfies all its implementation invariants and false, otherwise. Useful for debugging purposes.

ppl_Polyhedron_add_constraint handle constraint

Updates the polyhedron referenced by `handle` to one obtained by adding `constraint` to its constraint system.

ppl_Polyhedron_add_generator handle generator

Updates the polyhedron referenced by `handle` to one obtained by adding `generator` to its generator system.

ppl_Polyhedron_add_constraints handle constraint_system

Updates the polyhedron referenced by `handle` to one obtained by adding to its constraint system the constraints in `constraint_system`.

ppl_C_Polyhedron_add_generators handle generator_system

Updates the polyhedron referenced by `handle` to one obtained by adding to its generator system the generators in `generator_system`.

ppl_Polyhedron_intersection_assign handle_1 handle_2

Assigns to the polyhedron referenced by `handle_1` its intersection with the polyhedron referenced by `handle_2`.

ppl_Polyhedron_poly_hull_assign handle_1 handle_2

Assigns to the polyhedron referenced by `handle_1` its poly-hull with the polyhedron referenced by `handle_2`.

ppl_Polyhedron_poly_difference_assign handle_1 handle_2

Assigns to the polyhedron referenced by `handle_1` its poly-difference with the polyhedron referenced by `handle_2`.

ppl_Polyhedron_affine_image handle var lin_expr coefficient

Transforms the polyhedron referenced by `handle` assigning the affine expression `lin_expr/coefficient` to `var`.

ppl_Polyhedron_affine_preimage handle var lin_expr coefficient

This is the inverse transformation to that for `ppl_affine_image`.

ppl_Polyhedron_bounded_affine_image handle var lin_expr_1 lin_expr_2 coefficient

Transforms the polyhedron referenced by `handle` assigning the image with respect to the transfer relation `lin_expr_1/coefficient <= var <= lin_expr_2/coefficient`.

ppl_Polyhedron_generalized_affine_image handle var Relation_Symbol lin_expr coefficient

Transforms the polyhedron referenced by `handle` assigning the generalized affine image with respect to the transfer function `var Relation_Symbol lin_expr/coefficient`.

ppl_Polyhedron_generalized_affine_image_lhs_rhs handle lin_expr_1 Relation_Symbol lin_expr_2

Transforms the polyhedron referenced by `handle` assigning the generalized affine image with respect to the transfer function `lin_expr_1 Relation_Symbol lin_expr_2`.

ppl_Polyhedron_time_elapse_assign handle_1 handle_2

Assigns to the polyhedron $\mathcal{P}$ referenced by `handle_1` the time-elapse $(\mathcal{P} \nearrow \mathcal{Q})$ with the polyhedron $\mathcal{Q}$ referenced by `handle_2`.

ppl_Polyhedron_BHRZ03_widening_assign handle_1 handle_2

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the BHRZ03-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$.

ppl_Polyhedron_BHRZ03_widening_assign_with_tokens handle_1 handle_2 c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the BHRZ03-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$, Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, Then this function will return the number of tokens remaining at the end of the operation.

ppl_Polyhedron_limited_BHRZ03_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system`.

ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$, improved by enforcing those constraints in `constraint_system`.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, then this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the BHRZ03-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing those constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_H79_widening_assign handle_1 handle_2

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the H79-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$.

ppl_Polyhedron_H79_widening_assign_with_tokens handle_1 handle_2 c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the H79-widening of $\mathcal{P}_1$ with $\mathcal{P}_2$, Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, Then this function will return the number of tokens remaining at the end of the operation.

ppl_Polyhedron_limited_H79_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system`.

ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$, improved by enforcing those constraints in `constraint_system`.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, then this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_bounded_H79_extrapolation_assign handle_1 handle_2 constraint_system

If the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, then `handle_1` will refer to the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$ improved by enforcing the constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens handle_1 handle_2 constraint_system c_unsigned_1

It is assumed that the polyhedron $\mathcal{P}_1$ referenced by `handle_1` contains the polyhedron $\mathcal{P}_2$ referenced by `handle_2`; let $\mathcal{P}$ denote the H79-extrapolation of $\mathcal{P}_1$ with $\mathcal{P}_2$, improved by enforcing those constraints in `constraint_system` together with all constraints of the form $\pm x \leq r$ and $\pm x < r$ that are satisfied by every point in $\mathcal{P}_1$.

Assuming that the quantity t_1 given by `c_unsigned_1` is the number of tokens available, this function will return the number of tokens t_2 remaining at the end of the operation.

ppl_Polyhedron_topological_closure_assign handle

Assigns to the polyhedron referenced by `handle` its topological closure.

ppl_Polyhedron_add_space_dimensions_and_embed handle space_dimension

Embeds the polyhedron referenced by `handle` in a space that is enlarged by `space_dimension` dimensions,

ppl_Polyhedron_concatenate_assign handle_1 handle_2

Updates the polyhedron $\mathcal{P}_1$ referenced by `handle_1` by first embedding $\mathcal{P}_1$ in a new space enlarged by the space dimensions of the polyhedron $\mathcal{P}_2$ referenced by `handle_2`, and then adds to its system of constraints a renamed-apart version of the constraints of $\mathcal{P}_2$.

ppl_Polyhedron_add_space_dimensions_and_project handle space_dimension

Projects the polyhedron referenced by `handle` onto a space that is enlarged by `space_dimension` dimensions,

ppl_Polyhedron_remove_space_dimensions handle Int_List

Removes the space dimensions given by the identifiers of the PPL variables in list `Int_List` from the polyhedron referenced by `handle`. The identifiers for the remaining PPL variables are renumbered so that they are consecutive and the maximum index is less than the number of dimensions.

ppl_Polyhedron_remove_higher_space_dimensions handle space_dimension

Projects the polyhedron referenced to by `handle` onto the first `space_dimension` dimensions.

ppl_Polyhedron_expand_space_dimension handle var space_dimension

space_dimension copies of the space dimension referenced by variable var are added to the polyhedron referenced to by handle.

ppl_Polyhedron_fold_space_dimensions handle list_of_vars var

The space dimensions referenced by the PPL variables in list list_of_vars are folded into the dimension referenced by var and removed. The result is undefined if list_of_vars does not have the properties described in Section *Folding Multiple Dimensions of the Vector Space into One Dimension* of the main PPL user manual.

ppl_Polyhedron_map_space_dimensions handle p_func

Maps the space dimensions of the polyhedron referenced by handle using the partial function defined by a list of pairs of integers p_func. The result is undefined if p_func does not encode a partial function with the properties described in Section *Mapping the Dimensions of the Vector Space* of the main PPL user manual.

ppl_Polyhedron_wrap_assign handle list_of_vars width representation overflow constraint_system complexity_threshold wrap_indicator

Transforms the polyhedron referenced by handle by wrapping the dimensions given by list_of_vars while respecting the specified width, representation and overflow behavior of all these variables. The parameter constraint_system represents the conditional or looping construct guard with respect to which wrapping is performed. The non-negative integer complexity_threshold and Boolean wrap_indicator allow control of the complexity/precision ratio; higher values for complexity_threshold will lead to possibly greater precision while a true value for wrap_indicator indicates that the space dimensions should be wrapped individually. See Section *Wrapping Operator* for a more detailed description of this operator.

ppl_Polyhedron_ascii_dump handle

Returns a string containing an ASCII dump of the internal representation of the polyhedron referenced by handle. Useful for debugging purposes.

OCamldoc Documentation

NOTE: the complete documentation for module Ppl_ocaml, including all the types and functions that were enabled at configuration time, is only available in the *configuration dependent* OCamldoc documentation. The configuration independent OCamldoc documentation only contains those types and functions that are always enabled, which are grouped into module Ppl_ocaml_globals. Also note that module Ppl_ocaml automatically includes module Ppl_ocaml_globals.

2 Module Ppl_ocaml

```
exception PPL_arithmetic_overflow of string
```

```
exception PPL_timeout_exception
exception PPL_internal_error of string
exception PPL_unknown_standard_exception of string
exception PPL_unexpected_error of string
type degenerate_element =
  | Universe
  | Empty
type linear_expression =
  | Variable of int
  | Coefficient of Gmp.Z.t
  | Unary_Plus of linear_expression
  | Unary_Minus of linear_expression
  | Plus of linear_expression * linear_expression
  | Minus of linear_expression * linear_expression
  | Times of Gmp.Z.t * linear_expression
type linear_constraint =
  | Less_Than of linear_expression * linear_expression
  | Less_Or_Equal of linear_expression * linear_expression
  | Equal of linear_expression * linear_expression
  | Greater_Than of linear_expression * linear_expression
  | Greater_Or_Equal of linear_expression * linear_expression
type linear_generator =
  | Line of linear_expression
  | Ray of linear_expression
  | Point of linear_expression * Gmp.Z.t
  | Closure_Point of linear_expression * Gmp.Z.t
type linear_grid_generator =
  | Grid_Line of linear_expression
  | Grid_Parameter of linear_expression * Gmp.Z.t
  | Grid_Point of linear_expression * Gmp.Z.t
type poly_gen_relation =
  | Subsumes
type poly_con_relation =
  | Is_Disjoint
  | Strictly_Intersects
  | Is_Included
  | Saturates
type relation_with_congruence =
  | Is_Disjoint
  | Strictly_Intersects
  | Is_Included
type linear_congruence = linear_expression * linear_expression * Gmp.Z.t
type constraint_system = linear_constraint list
type generator_system = linear_generator list
type grid_generator_system = linear_grid_generator list
type congruence_system = linear_congruence list
type relation_symbol =
  | Less_Than_RS
  | Less_Or_Equal_RS
  | Equal_RS
```

```
  | Greater_Than_RS
  | Greater_Or_Equal_RS
type bounded_integer_type_overflow =
  | Overflow_Wraps
  | Overflow_Undefined
  | Overflow_Impossible
type bounded_integer_type_representation =
  | Unsigned
  | Signed_2_Complement
type bounded_integer_type_width =
  | Bits_8
  | Bits_16
  | Bits_32
  | Bits_64
  | Bits_128
type complexity_class =
  | Polynomial_Complexity
  | Simplex_Complexity
  | Any_Complexity
type optimization_mode =
  | Minimization
  | Maximization
type mip_problem_status =
  | Unfeasible_Mip_Problem
  | Unbounded_Mip_Problem
  | Optimized_Mip_Problem
type control_parameter_name =
  | Pricing
type control_parameter_value =
  | Pricing_Steepest_Edge_Float
  | Pricing_Steepest_Edge_Exact
  | Pricing_Textbook
type pip_problem_status =
  | Unfeasible_Pip_Problem
  | Optimized_Pip_Problem
type pip_problem_control_parameter_name =
  | Cutting_Strategy
  | Pivot_Row_Strategy
type pip_problem_control_parameter_value =
  | Cutting_Strategy_First
  | Cutting_Strategy_Deepest
  | Cutting_Strategy_All
  | Pivot_Row_Strategy_First
  | Pivot_Row_Strategy_Max_Column
val ppl_version_major : unit -> int
val ppl_version_minor : unit -> int
val ppl_version_revision : unit -> int
val ppl_version_beta : unit -> int
val ppl_version : unit -> string
val ppl_banner : unit -> string
```

```
val ppl_io_wrap_string : string -> int -> int -> int -> string
val ppl_max_space_dimension : unit -> int
val ppl_Coefficient_bits : unit -> int
val ppl_Coefficient_is_bounded : unit -> bool
val ppl_Coefficient_max : unit -> Gmp.Z.t
val ppl_Coefficient_min : unit -> Gmp.Z.t
val ppl_Linear_Expression_is_zero : linear_expression -> bool
val ppl_Linear_Expression_all_homogeneous_terms_are_zero :
  linear_expression -> bool
val ppl_set_rounding_for_PPL : unit -> unit
val ppl_restore_pre_PPL_rounding : unit -> unit
val ppl_irrational_precision : unit -> int
val ppl_set_irrational_precision : int -> unit
val ppl_set_timeout : int -> unit
val ppl_reset_timeout : unit -> unit
val ppl_set_deterministic_timeout : int -> unit
val ppl_reset_deterministic_timeout : unit -> unit
type mip_problem
val ppl_new_MIP_Problem_from_space_dimension : int -> mip_problem
val ppl_new_MIP_Problem :
  int ->
  constraint_system ->
  linear_expression ->
  optimization_mode -> mip_problem
val ppl_MIP_Problem_space_dimension : mip_problem -> int
val ppl_MIP_Problem_integer_space_dimensions : mip_problem -> int list
val ppl_MIP_Problem_constraints : mip_problem -> constraint_system
val ppl_MIP_Problem_add_space_dimensions_and_embed :
  mip_problem -> int -> unit
val ppl_MIP_Problem_add_to_integer_space_dimensions :
  mip_problem -> int list -> unit
val ppl_MIP_Problem_add_constraint : mip_problem -> linear_constraint -> unit
val ppl_MIP_Problem_add_constraints :
  mip_problem -> constraint_system -> unit
val ppl_MIP_Problem_set_objective_function :
  mip_problem -> linear_expression -> unit
val ppl_MIP_Problem_is_satisfiable : mip_problem -> bool
val ppl_MIP_Problem_solve : mip_problem -> mip_problem_status
val ppl_MIP_Problem_optimization_mode : mip_problem -> optimization_mode
val ppl_MIP_Problem_feasible_point : mip_problem -> linear_generator
val ppl_MIP_Problem_optimizing_point : mip_problem -> linear_generator
val ppl_MIP_Problem_objective_function : mip_problem -> linear_expression
val ppl_MIP_Problem_optimal_value : mip_problem -> Gmp.Z.t * Gmp.Z.t
val ppl_MIP_Problem_evaluate_objective_function :
  mip_problem -> linear_generator -> Gmp.Z.t * Gmp.Z.t
```

```
val ppl_MIP_Problem_OK : mip_problem -> bool
val ppl_MIP_Problem_clear : mip_problem -> unit
val ppl_MIP_Problem_set_optimization_mode :
  mip_problem -> optimization_mode -> unit
val ppl_MIP_Problem_set_control_parameter :
  mip_problem -> control_parameter_value -> unit
val ppl_MIP_Problem_get_control_parameter :
  mip_problem ->
  control_parameter_name -> control_parameter_value
val ppl_MIP_Problem_swap : mip_problem -> mip_problem -> unit
val ppl_MIP_Problem_ascii_dump : mip_problem -> string
type pip_problem
type pip_tree_node
type artificial_parameter = linear_expression * Gmp.Z.t
val ppl_new_PIP_Problem_from_space_dimension : int -> pip_problem
val ppl_new_PIP_Problem : int -> constraint_system -> int list -> pip_problem
val ppl_PIP_Problem_space_dimension : pip_problem -> int
val ppl_PIP_Problem_parameter_space_dimensions : pip_problem -> int list
val ppl_PIP_Problem_constraints : pip_problem -> constraint_system
val ppl_PIP_Problem_add_space_dimensions_and_embed :
  pip_problem -> int -> int -> unit
val ppl_PIP_Problem_add_to_parameter_space_dimensions :
  pip_problem -> int list -> unit
val ppl_PIP_Problem_add_constraint : pip_problem -> linear_constraint -> unit
val ppl_PIP_Problem_add_constraints :
  pip_problem -> constraint_system -> unit
val ppl_PIP_Problem_is_satisfiable : pip_problem -> bool
val ppl_PIP_Problem_solve : pip_problem -> pip_problem_status
val ppl_PIP_Problem_solution : pip_problem -> pip_tree_node
val ppl_PIP_Problem_optimizing_solution : pip_problem -> pip_tree_node
val ppl_PIP_Problem_get_big_parameter_dimension : pip_problem -> int
val ppl_PIP_Problem_set_big_parameter_dimension : pip_problem -> int -> unit
val ppl_PIP_Problem_has_big_parameter_dimension : pip_problem -> bool
val ppl_PIP_Problem_OK : pip_problem -> bool
val ppl_PIP_Problem_clear : pip_problem -> unit
val ppl_PIP_Problem_set_control_parameter :
  pip_problem ->
  pip_problem_control_parameter_value -> unit
val ppl_PIP_Problem_get_control_parameter :
  pip_problem ->
  pip_problem_control_parameter_name ->
  pip_problem_control_parameter_value
val ppl_PIP_Problem_swap : pip_problem -> pip_problem -> unit
val ppl_PIP_Problem_ascii_dump : pip_problem -> string
val ppl_PIP_Tree_Node_constraints : pip_tree_node -> constraint_system
val ppl_PIP_Tree_Node_artificials :
```

```
  pip_tree_node -> artificial_parameter list
val ppl_PIP_Tree_Node_ascii_dump : pip_tree_node -> string
val ppl_PIP_Tree_Node_OK : pip_tree_node -> bool
val ppl_PIP_Tree_Node_is_bottom : pip_tree_node -> bool
val ppl_PIP_Tree_Node_is_solution : pip_tree_node -> bool
val ppl_PIP_Tree_Node_parametric_values :
  pip_tree_node -> int -> linear_expression
val ppl_PIP_Tree_Node_is_decision : pip_tree_node -> bool
val ppl_PIP_Tree_Node_true_child : pip_tree_node -> pip_tree_node
val ppl_PIP_Tree_Node_false_child : pip_tree_node -> pip_tree_node
type int8_box
type int16_box
type int32_box
type int64_box
type uint8_box
type uint16_box
type uint32_box
type uint64_box
type z_box
type rational_box
type bd_shape_int8_t
type bd_shape_int16_t
type bd_shape_int32_t
type bd_shape_int64_t
type bd_shape_mpz_class
type bd_shape_mpq_class
type octagonal_shape_int8_t
type octagonal_shape_int16_t
type octagonal_shape_int32_t
type octagonal_shape_int64_t
type octagonal_shape_mpz_class
type octagonal_shape_mpq_class
type polyhedron
type grid
type pointset_powerset_int8_box
type pointset_powerset_int16_box
type pointset_powerset_int32_box
type pointset_powerset_int64_box
type pointset_powerset_uint8_box
type pointset_powerset_uint16_box
type pointset_powerset_uint32_box
type pointset_powerset_uint64_box
type pointset_powerset_rational_box
type pointset_powerset_z_box
```

```
type pointset_powerset_bd_shape_int8_t
type pointset_powerset_bd_shape_int16_t
type pointset_powerset_bd_shape_int32_t
type pointset_powerset_bd_shape_int64_t
type pointset_powerset_bd_shape_mpq_class
type pointset_powerset_bd_shape_mpz_class
type pointset_powerset_octagonal_shape_int8_t
type pointset_powerset_octagonal_shape_int16_t
type pointset_powerset_octagonal_shape_int32_t
type pointset_powerset_octagonal_shape_int64_t
type pointset_powerset_octagonal_shape_mpq_class
type pointset_powerset_octagonal_shape_mpz_class
type pointset_powerset_c_polyhedron
type pointset_powerset_nnc_polyhedron
type pointset_powerset_grid
type constraints_product_c_polyhedron_grid
type constraints_product_nnc_polyhedron_grid
type constraints_product_grid_c_polyhedron
type constraints_product_grid_nnc_polyhedron
type float_box
type bd_shape_float
type octagonal_shape_float
type pointset_powerset_float_box
type pointset_powerset_bd_shape_float
type pointset_powerset_octagonal_shape_float
type double_box
type bd_shape_double
type octagonal_shape_double
type pointset_powerset_double_box
type pointset_powerset_bd_shape_double
type pointset_powerset_octagonal_shape_double
type long_double_box
type bd_shape_long_double
type octagonal_shape_long_double
type pointset_powerset_long_double_box
type pointset_powerset_bd_shape_long_double
type pointset_powerset_octagonal_shape_long_double
val ppl_new_Int8_Box_from_space_dimension :
  int -> degenerate_element -> int8_box
val ppl_new_Int8_Box_from_Int8_Box : int8_box -> int8_box
val ppl_new_Int8_Box_from_Int16_Box : int16_box -> int8_box
val ppl_new_Int8_Box_from_Int32_Box : int32_box -> int8_box
val ppl_new_Int8_Box_from_Int64_Box : int64_box -> int8_box
val ppl_new_Int8_Box_from_Uint8_Box : uint8_box -> int8_box
```

```
val ppl_new_Int8_Box_from_Uint16_Box : uint16_box -> int8_box
val ppl_new_Int8_Box_from_Uint32_Box : uint32_box -> int8_box
val ppl_new_Int8_Box_from_Uint64_Box : uint64_box -> int8_box
val ppl_new_Int8_Box_from_Z_Box : z_box -> int8_box
val ppl_new_Int8_Box_from_Rational_Box : rational_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpz_class : bd_shape_mpz_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpq_class : bd_shape_mpq_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int8_box
val ppl_new_Int8_Box_from_C_Polyhedron : polyhedron -> int8_box
val ppl_new_Int8_Box_from_NNC_Polyhedron : polyhedron -> int8_box
val ppl_new_Int8_Box_from_Grid : grid -> int8_box
val ppl_new_Int8_Box_from_Float_Box : float_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_float : bd_shape_float -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int8_box
val ppl_new_Int8_Box_from_Double_Box : double_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_double : bd_shape_double -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int8_box
val ppl_new_Int8_Box_from_Long_Double_Box : long_double_box -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int8_box
val ppl_new_Int8_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Int64_Box_with_complexity :
```

```
  int64_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_C_Polyhedron_with_complexity :
```

```
  polyhedron -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Long_Double_Box_with_complexity :
  long_double_box -> complexity_class -> int8_box
val ppl_new_Int8_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> int8_box
val ppl_new_Int8_Box_from_constraints : constraint_system -> int8_box
val ppl_new_Int8_Box_from_congruences : congruence_system -> int8_box
val ppl_new_Int8_Box_from_generators : generator_system -> int8_box
val ppl_Int8_Box_swap : int8_box -> int8_box -> unit
val ppl_Int8_Box_space_dimension : int8_box -> int
val ppl_Int8_Box_affine_dimension : int8_box -> int
val ppl_Int8_Box_relation_with_constraint :
  int8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int8_Box_relation_with_generator :
  int8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int8_Box_relation_with_congruence :
  int8_box ->
  linear_congruence -> poly_con_relation list
val ppl_Int8_Box_get_constraints : int8_box -> constraint_system
val ppl_Int8_Box_get_congruences : int8_box -> congruence_system
val ppl_Int8_Box_get_minimized_constraints : int8_box -> constraint_system
val ppl_Int8_Box_get_minimized_congruences : int8_box -> congruence_system
val ppl_Int8_Box_is_empty : int8_box -> bool
val ppl_Int8_Box_is_universe : int8_box -> bool
```

```
val ppl_Int8_Box_is_bounded : int8_box -> bool
val ppl_Int8_Box_contains_integer_point : int8_box -> bool
val ppl_Int8_Box_is_topologically_closed : int8_box -> bool
val ppl_Int8_Box_is_discrete : int8_box -> bool
val ppl_Int8_Box_topological_closure_assign : int8_box -> unit
val ppl_Int8_Box_bounds_from_above : int8_box -> linear_expression -> bool
val ppl_Int8_Box_bounds_from_below : int8_box -> linear_expression -> bool
val ppl_Int8_Box_maximize :
  int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int8_Box_minimize :
  int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int8_Box_maximize_with_point :
  int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int8_Box_minimize_with_point :
  int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int8_Box_frequency :
  int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int8_Box_contains_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_strictly_contains_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_is_disjoint_from_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_equals_Int8_Box : int8_box -> int8_box -> bool
val ppl_Int8_Box_OK : int8_box -> bool
val ppl_Int8_Box_add_constraint : int8_box -> linear_constraint -> unit
val ppl_Int8_Box_add_congruence : int8_box -> linear_congruence -> unit
val ppl_Int8_Box_add_constraints : int8_box -> constraint_system -> unit
val ppl_Int8_Box_add_congruences : int8_box -> congruence_system -> unit
val ppl_Int8_Box_refine_with_constraint :
  int8_box -> linear_constraint -> unit
val ppl_Int8_Box_refine_with_congruence :
  int8_box -> linear_congruence -> unit
val ppl_Int8_Box_refine_with_constraints :
  int8_box -> constraint_system -> unit
val ppl_Int8_Box_refine_with_congruences :
  int8_box -> congruence_system -> unit
val ppl_Int8_Box_intersection_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_upper_bound_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_difference_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_concatenate_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_time_elapse_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_upper_bound_assign_if_exact : int8_box -> int8_box -> bool
```

```
val ppl_Int8_Box_simplify_using_context_assign : int8_box -> int8_box -> bool
val ppl_Int8_Box_constrains : int8_box -> int -> bool
val ppl_Int8_Box_unconstrain_space_dimension : int8_box -> int -> unit
val ppl_Int8_Box_unconstrain_space_dimensions : int8_box -> int list -> unit
val ppl_Int8_Box_affine_image :
  int8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_affine_preimage :
  int8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_bounded_affine_image :
  int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_bounded_affine_preimage :
  int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_generalized_affine_image :
  int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_generalized_affine_preimage :
  int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int8_Box_generalized_affine_image_lhs_rhs :
  int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int8_Box_generalized_affine_preimage_lhs_rhs :
  int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int8_Box_add_space_dimensions_and_embed : int8_box -> int -> unit
val ppl_Int8_Box_add_space_dimensions_and_project : int8_box -> int -> unit
val ppl_Int8_Box_remove_space_dimensions : int8_box -> int list -> unit
val ppl_Int8_Box_remove_higher_space_dimensions : int8_box -> int -> unit
val ppl_Int8_Box_expand_space_dimension : int8_box -> int -> int -> unit
val ppl_Int8_Box_fold_space_dimensions : int8_box -> int list -> int -> unit
val ppl_Int8_Box_map_space_dimensions : int8_box -> (int * int) list -> unit
val ppl_Int8_Box_drop_some_non_integer_points :
  int8_box -> complexity_class -> unit
val ppl_Int8_Box_drop_some_non_integer_points_2 :
  int8_box -> int list -> complexity_class -> unit
val ppl_Int8_Box_ascii_dump : int8_box -> string
val ppl_Int8_Box_external_memory_in_bytes : int8_box -> int
val ppl_Int8_Box_total_memory_in_bytes : int8_box -> int
val ppl_Int8_Box_CC76_widening_assign_with_tokens :
  int8_box -> int8_box -> int -> int
```

```
val ppl_Int8_Box_CC76_widening_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_widening_assign_with_tokens :
  int8_box -> int8_box -> int -> int
val ppl_Int8_Box_widening_assign : int8_box -> int8_box -> unit
val ppl_Int8_Box_limited_CC76_extrapolation_assign_with_tokens :
  int8_box ->
  int8_box -> constraint_system -> int -> int
val ppl_Int8_Box_limited_CC76_extrapolation_assign :
  int8_box ->
  int8_box -> constraint_system -> unit
val ppl_Int8_Box_linear_partition :
  int8_box ->
  int8_box ->
  int8_box * pointset_powerset_nnc_polyhedron
val ppl_Int8_Box_wrap_assign :
  int8_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int8_Box : int8_box -> bool
val ppl_termination_test_PR_Int8_Box : int8_box -> bool
val ppl_one_affine_ranking_function_MS_Int8_Box :
  int8_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int8_Box :
  int8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int8_Box : int8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int8_Box : int8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int8_Box :
  int8_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int8_Box_2 : int8_box -> int8_box -> bool
val ppl_termination_test_PR_Int8_Box_2 : int8_box -> int8_box -> bool
val ppl_one_affine_ranking_function_MS_Int8_Box_2 :
  int8_box -> int8_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int8_Box_2 :
  int8_box -> int8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int8_Box_2 :
  int8_box -> int8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int8_Box_2 :
  int8_box -> int8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int8_Box_2 :
  int8_box ->
  int8_box -> polyhedron * polyhedron
val ppl_new_Int16_Box_from_space_dimension :
  int -> degenerate_element -> int16_box
val ppl_new_Int16_Box_from_Int8_Box : int8_box -> int16_box
val ppl_new_Int16_Box_from_Int16_Box : int16_box -> int16_box
```

```
val ppl_new_Int16_Box_from_Int32_Box : int32_box -> int16_box
val ppl_new_Int16_Box_from_Int64_Box : int64_box -> int16_box
val ppl_new_Int16_Box_from_Uint8_Box : uint8_box -> int16_box
val ppl_new_Int16_Box_from_Uint16_Box : uint16_box -> int16_box
val ppl_new_Int16_Box_from_Uint32_Box : uint32_box -> int16_box
val ppl_new_Int16_Box_from_Uint64_Box : uint64_box -> int16_box
val ppl_new_Int16_Box_from_Z_Box : z_box -> int16_box
val ppl_new_Int16_Box_from_Rational_Box : rational_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int16_box
val ppl_new_Int16_Box_from_C_Polyhedron : polyhedron -> int16_box
val ppl_new_Int16_Box_from_NNC_Polyhedron : polyhedron -> int16_box
val ppl_new_Int16_Box_from_Grid : grid -> int16_box
val ppl_new_Int16_Box_from_Float_Box : float_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_float : bd_shape_float -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int16_box
val ppl_new_Int16_Box_from_Double_Box : double_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_double : bd_shape_double -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int16_box
val ppl_new_Int16_Box_from_Long_Double_Box : long_double_box -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int16_box
val ppl_new_Int16_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int16_box
```

```
val ppl_new_Int16_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpz_class_with_complexity :
```

```
  octagonal_shape_mpz_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> int16_box
val ppl_new_Int16_Box_from_constraints : constraint_system -> int16_box
val ppl_new_Int16_Box_from_congruences : congruence_system -> int16_box
val ppl_new_Int16_Box_from_generators : generator_system -> int16_box
val ppl_Int16_Box_swap : int16_box -> int16_box -> unit
val ppl_Int16_Box_space_dimension : int16_box -> int
val ppl_Int16_Box_affine_dimension : int16_box -> int
val ppl_Int16_Box_relation_with_constraint :
  int16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int16_Box_relation_with_generator :
  int16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int16_Box_relation_with_congruence :
  int16_box ->
```

```
  linear_congruence -> poly_con_relation list
val ppl_Int16_Box_get_constraints : int16_box -> constraint_system
val ppl_Int16_Box_get_congruences : int16_box -> congruence_system
val ppl_Int16_Box_get_minimized_constraints : int16_box -> constraint_system
val ppl_Int16_Box_get_minimized_congruences : int16_box -> congruence_system
val ppl_Int16_Box_is_empty : int16_box -> bool
val ppl_Int16_Box_is_universe : int16_box -> bool
val ppl_Int16_Box_is_bounded : int16_box -> bool
val ppl_Int16_Box_contains_integer_point : int16_box -> bool
val ppl_Int16_Box_is_topologically_closed : int16_box -> bool
val ppl_Int16_Box_is_discrete : int16_box -> bool
val ppl_Int16_Box_topological_closure_assign : int16_box -> unit
val ppl_Int16_Box_bounds_from_above : int16_box -> linear_expression -> bool
val ppl_Int16_Box_bounds_from_below : int16_box -> linear_expression -> bool
val ppl_Int16_Box_maximize :
  int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int16_Box_minimize :
  int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int16_Box_maximize_with_point :
  int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int16_Box_minimize_with_point :
  int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int16_Box_frequency :
  int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int16_Box_contains_Int16_Box : int16_box -> int16_box -> bool
val ppl_Int16_Box_strictly_contains_Int16_Box :
  int16_box -> int16_box -> bool
val ppl_Int16_Box_is_disjoint_from_Int16_Box : int16_box -> int16_box -> bool
val ppl_Int16_Box_equals_Int16_Box : int16_box -> int16_box -> bool
val ppl_Int16_Box_OK : int16_box -> bool
val ppl_Int16_Box_add_constraint : int16_box -> linear_constraint -> unit
val ppl_Int16_Box_add_congruence : int16_box -> linear_congruence -> unit
val ppl_Int16_Box_add_constraints : int16_box -> constraint_system -> unit
val ppl_Int16_Box_add_congruences : int16_box -> congruence_system -> unit
val ppl_Int16_Box_refine_with_constraint :
  int16_box -> linear_constraint -> unit
val ppl_Int16_Box_refine_with_congruence :
  int16_box -> linear_congruence -> unit
val ppl_Int16_Box_refine_with_constraints :
  int16_box -> constraint_system -> unit
```

```
val ppl_Int16_Box_refine_with_congruences :
  int16_box -> congruence_system -> unit
val ppl_Int16_Box_intersection_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_upper_bound_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_difference_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_concatenate_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_time_elapse_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_upper_bound_assign_if_exact :
  int16_box -> int16_box -> bool
val ppl_Int16_Box_simplify_using_context_assign :
  int16_box -> int16_box -> bool
val ppl_Int16_Box_constrains : int16_box -> int -> bool
val ppl_Int16_Box_unconstrain_space_dimension : int16_box -> int -> unit
val ppl_Int16_Box_unconstrain_space_dimensions :
  int16_box -> int list -> unit
val ppl_Int16_Box_affine_image :
  int16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_affine_preimage :
  int16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_bounded_affine_image :
  int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_bounded_affine_preimage :
  int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_generalized_affine_image :
  int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_generalized_affine_preimage :
  int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int16_Box_generalized_affine_image_lhs_rhs :
  int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int16_Box_generalized_affine_preimage_lhs_rhs :
  int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int16_Box_add_space_dimensions_and_embed : int16_box -> int -> unit
val ppl_Int16_Box_add_space_dimensions_and_project : int16_box -> int -> unit
val ppl_Int16_Box_remove_space_dimensions : int16_box -> int list -> unit
val ppl_Int16_Box_remove_higher_space_dimensions : int16_box -> int -> unit
val ppl_Int16_Box_expand_space_dimension : int16_box -> int -> int -> unit
```

```
val ppl_Int16_Box_fold_space_dimensions :
  int16_box -> int list -> int -> unit
val ppl_Int16_Box_map_space_dimensions :
  int16_box -> (int * int) list -> unit
val ppl_Int16_Box_drop_some_non_integer_points :
  int16_box -> complexity_class -> unit
val ppl_Int16_Box_drop_some_non_integer_points_2 :
  int16_box -> int list -> complexity_class -> unit
val ppl_Int16_Box_ascii_dump : int16_box -> string
val ppl_Int16_Box_external_memory_in_bytes : int16_box -> int
val ppl_Int16_Box_total_memory_in_bytes : int16_box -> int
val ppl_Int16_Box_CC76_widening_assign_with_tokens :
  int16_box -> int16_box -> int -> int
val ppl_Int16_Box_CC76_widening_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_widening_assign_with_tokens :
  int16_box -> int16_box -> int -> int
val ppl_Int16_Box_widening_assign : int16_box -> int16_box -> unit
val ppl_Int16_Box_limited_CC76_extrapolation_assign_with_tokens :
  int16_box ->
  int16_box -> constraint_system -> int -> int
val ppl_Int16_Box_limited_CC76_extrapolation_assign :
  int16_box ->
  int16_box -> constraint_system -> unit
val ppl_Int16_Box_linear_partition :
  int16_box ->
  int16_box ->
  int16_box * pointset_powerset_nnc_polyhedron
val ppl_Int16_Box_wrap_assign :
  int16_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int16_Box : int16_box -> bool
val ppl_termination_test_PR_Int16_Box : int16_box -> bool
val ppl_one_affine_ranking_function_MS_Int16_Box :
  int16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int16_Box :
  int16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int16_Box : int16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int16_Box : int16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int16_Box :
  int16_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int16_Box_2 : int16_box -> int16_box -> bool
val ppl_termination_test_PR_Int16_Box_2 : int16_box -> int16_box -> bool
val ppl_one_affine_ranking_function_MS_Int16_Box_2 :
  int16_box ->
```

```
  int16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int16_Box_2 :
  int16_box ->
  int16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int16_Box_2 :
  int16_box -> int16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int16_Box_2 :
  int16_box -> int16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int16_Box_2 :
  int16_box ->
  int16_box -> polyhedron * polyhedron
val ppl_new_Int32_Box_from_space_dimension :
  int -> degenerate_element -> int32_box
val ppl_new_Int32_Box_from_Int8_Box : int8_box -> int32_box
val ppl_new_Int32_Box_from_Int16_Box : int16_box -> int32_box
val ppl_new_Int32_Box_from_Int32_Box : int32_box -> int32_box
val ppl_new_Int32_Box_from_Int64_Box : int64_box -> int32_box
val ppl_new_Int32_Box_from_Uint8_Box : uint8_box -> int32_box
val ppl_new_Int32_Box_from_Uint16_Box : uint16_box -> int32_box
val ppl_new_Int32_Box_from_Uint32_Box : uint32_box -> int32_box
val ppl_new_Int32_Box_from_Uint64_Box : uint64_box -> int32_box
val ppl_new_Int32_Box_from_Z_Box : z_box -> int32_box
val ppl_new_Int32_Box_from_Rational_Box : rational_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int32_box
val ppl_new_Int32_Box_from_C_Polyhedron : polyhedron -> int32_box
val ppl_new_Int32_Box_from_NNC_Polyhedron : polyhedron -> int32_box
val ppl_new_Int32_Box_from_Grid : grid -> int32_box
```

```
val ppl_new_Int32_Box_from_Float_Box : float_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_float : bd_shape_float -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int32_box
val ppl_new_Int32_Box_from_Double_Box : double_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_double : bd_shape_double -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int32_box
val ppl_new_Int32_Box_from_Long_Double_Box : long_double_box -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int32_box
val ppl_new_Int32_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int32_box
```

```
val ppl_new_Int32_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
```

```
  complexity_class -> int32_box
val ppl_new_Int32_Box_from_constraints : constraint_system -> int32_box
val ppl_new_Int32_Box_from_congruences : congruence_system -> int32_box
val ppl_new_Int32_Box_from_generators : generator_system -> int32_box
val ppl_Int32_Box_swap : int32_box -> int32_box -> unit
val ppl_Int32_Box_space_dimension : int32_box -> int
val ppl_Int32_Box_affine_dimension : int32_box -> int
val ppl_Int32_Box_relation_with_constraint :
  int32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int32_Box_relation_with_generator :
  int32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int32_Box_relation_with_congruence :
  int32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Int32_Box_get_constraints : int32_box -> constraint_system
val ppl_Int32_Box_get_congruences : int32_box -> congruence_system
val ppl_Int32_Box_get_minimized_constraints : int32_box -> constraint_system
val ppl_Int32_Box_get_minimized_congruences : int32_box -> congruence_system
val ppl_Int32_Box_is_empty : int32_box -> bool
val ppl_Int32_Box_is_universe : int32_box -> bool
val ppl_Int32_Box_is_bounded : int32_box -> bool
val ppl_Int32_Box_contains_integer_point : int32_box -> bool
val ppl_Int32_Box_is_topologically_closed : int32_box -> bool
val ppl_Int32_Box_is_discrete : int32_box -> bool
val ppl_Int32_Box_topological_closure_assign : int32_box -> unit
val ppl_Int32_Box_bounds_from_above : int32_box -> linear_expression -> bool
val ppl_Int32_Box_bounds_from_below : int32_box -> linear_expression -> bool
val ppl_Int32_Box_maximize :
  int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int32_Box_minimize :
  int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int32_Box_maximize_with_point :
  int32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int32_Box_minimize_with_point :
  int32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int32_Box_frequency :
  int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int32_Box_contains_Int32_Box : int32_box -> int32_box -> bool
```

```
val ppl_Int32_Box_strictly_contains_Int32_Box :
  int32_box -> int32_box -> bool
val ppl_Int32_Box_is_disjoint_from_Int32_Box : int32_box -> int32_box -> bool
val ppl_Int32_Box_equals_Int32_Box : int32_box -> int32_box -> bool
val ppl_Int32_Box_OK : int32_box -> bool
val ppl_Int32_Box_add_constraint : int32_box -> linear_constraint -> unit
val ppl_Int32_Box_add_congruence : int32_box -> linear_congruence -> unit
val ppl_Int32_Box_add_constraints : int32_box -> constraint_system -> unit
val ppl_Int32_Box_add_congruences : int32_box -> congruence_system -> unit
val ppl_Int32_Box_refine_with_constraint :
  int32_box -> linear_constraint -> unit
val ppl_Int32_Box_refine_with_congruence :
  int32_box -> linear_congruence -> unit
val ppl_Int32_Box_refine_with_constraints :
  int32_box -> constraint_system -> unit
val ppl_Int32_Box_refine_with_congruences :
  int32_box -> congruence_system -> unit
val ppl_Int32_Box_intersection_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_upper_bound_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_difference_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_concatenate_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_time_elapse_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_upper_bound_assign_if_exact :
  int32_box -> int32_box -> bool
val ppl_Int32_Box_simplify_using_context_assign :
  int32_box -> int32_box -> bool
val ppl_Int32_Box_constrains : int32_box -> int -> bool
val ppl_Int32_Box_unconstrain_space_dimension : int32_box -> int -> unit
val ppl_Int32_Box_unconstrain_space_dimensions :
  int32_box -> int list -> unit
val ppl_Int32_Box_affine_image :
  int32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_affine_preimage :
  int32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_bounded_affine_image :
  int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_bounded_affine_preimage :
  int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_generalized_affine_image :
  int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_generalized_affine_preimage :
```

```
  int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int32_Box_generalized_affine_image_lhs_rhs :
  int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int32_Box_generalized_affine_preimage_lhs_rhs :
  int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int32_Box_add_space_dimensions_and_embed : int32_box -> int -> unit
val ppl_Int32_Box_add_space_dimensions_and_project : int32_box -> int -> unit
val ppl_Int32_Box_remove_space_dimensions : int32_box -> int list -> unit
val ppl_Int32_Box_remove_higher_space_dimensions : int32_box -> int -> unit
val ppl_Int32_Box_expand_space_dimension : int32_box -> int -> int -> unit
val ppl_Int32_Box_fold_space_dimensions :
  int32_box -> int list -> int -> unit
val ppl_Int32_Box_map_space_dimensions :
  int32_box -> (int * int) list -> unit
val ppl_Int32_Box_drop_some_non_integer_points :
  int32_box -> complexity_class -> unit
val ppl_Int32_Box_drop_some_non_integer_points_2 :
  int32_box -> int list -> complexity_class -> unit
val ppl_Int32_Box_ascii_dump : int32_box -> string
val ppl_Int32_Box_external_memory_in_bytes : int32_box -> int
val ppl_Int32_Box_total_memory_in_bytes : int32_box -> int
val ppl_Int32_Box_CC76_widening_assign_with_tokens :
  int32_box -> int32_box -> int -> int
val ppl_Int32_Box_CC76_widening_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_widening_assign_with_tokens :
  int32_box -> int32_box -> int -> int
val ppl_Int32_Box_widening_assign : int32_box -> int32_box -> unit
val ppl_Int32_Box_limited_CC76_extrapolation_assign_with_tokens :
  int32_box ->
  int32_box -> constraint_system -> int -> int
val ppl_Int32_Box_limited_CC76_extrapolation_assign :
  int32_box ->
  int32_box -> constraint_system -> unit
val ppl_Int32_Box_linear_partition :
  int32_box ->
  int32_box ->
  int32_box * pointset_powerset_nnc_polyhedron
val ppl_Int32_Box_wrap_assign :
  int32_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
```

```
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int32_Box : int32_box -> bool
val ppl_termination_test_PR_Int32_Box : int32_box -> bool
val ppl_one_affine_ranking_function_MS_Int32_Box :
  int32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int32_Box :
  int32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int32_Box : int32_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int32_Box : int32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int32_Box :
  int32_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int32_Box_2 : int32_box -> int32_box -> bool
val ppl_termination_test_PR_Int32_Box_2 : int32_box -> int32_box -> bool
val ppl_one_affine_ranking_function_MS_Int32_Box_2 :
  int32_box ->
  int32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int32_Box_2 :
  int32_box ->
  int32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int32_Box_2 :
  int32_box -> int32_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int32_Box_2 :
  int32_box -> int32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int32_Box_2 :
  int32_box ->
  int32_box -> polyhedron * polyhedron
val ppl_new_Int64_Box_from_space_dimension :
  int -> degenerate_element -> int64_box
val ppl_new_Int64_Box_from_Int8_Box : int8_box -> int64_box
val ppl_new_Int64_Box_from_Int16_Box : int16_box -> int64_box
val ppl_new_Int64_Box_from_Int32_Box : int32_box -> int64_box
val ppl_new_Int64_Box_from_Int64_Box : int64_box -> int64_box
val ppl_new_Int64_Box_from_Uint8_Box : uint8_box -> int64_box
val ppl_new_Int64_Box_from_Uint16_Box : uint16_box -> int64_box
val ppl_new_Int64_Box_from_Uint32_Box : uint32_box -> int64_box
val ppl_new_Int64_Box_from_Uint64_Box : uint64_box -> int64_box
val ppl_new_Int64_Box_from_Z_Box : z_box -> int64_box
val ppl_new_Int64_Box_from_Rational_Box : rational_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> int64_box
```

```
val ppl_new_Int64_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> int64_box
val ppl_new_Int64_Box_from_C_Polyhedron : polyhedron -> int64_box
val ppl_new_Int64_Box_from_NNC_Polyhedron : polyhedron -> int64_box
val ppl_new_Int64_Box_from_Grid : grid -> int64_box
val ppl_new_Int64_Box_from_Float_Box : float_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_float : bd_shape_float -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> int64_box
val ppl_new_Int64_Box_from_Double_Box : double_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_double : bd_shape_double -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> int64_box
val ppl_new_Int64_Box_from_Long_Double_Box : long_double_box -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> int64_box
val ppl_new_Int64_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Rational_Box_with_complexity :
```

```
  rational_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Grid_with_complexity :
  grid -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> int64_box
```

```
val ppl_new_Int64_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> int64_box
val ppl_new_Int64_Box_from_constraints : constraint_system -> int64_box
val ppl_new_Int64_Box_from_congruences : congruence_system -> int64_box
val ppl_new_Int64_Box_from_generators : generator_system -> int64_box
val ppl_Int64_Box_swap : int64_box -> int64_box -> unit
val ppl_Int64_Box_space_dimension : int64_box -> int
val ppl_Int64_Box_affine_dimension : int64_box -> int
val ppl_Int64_Box_relation_with_constraint :
  int64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Int64_Box_relation_with_generator :
  int64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Int64_Box_relation_with_congruence :
  int64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Int64_Box_get_constraints : int64_box -> constraint_system
val ppl_Int64_Box_get_congruences : int64_box -> congruence_system
val ppl_Int64_Box_get_minimized_constraints : int64_box -> constraint_system
val ppl_Int64_Box_get_minimized_congruences : int64_box -> congruence_system
val ppl_Int64_Box_is_empty : int64_box -> bool
val ppl_Int64_Box_is_universe : int64_box -> bool
val ppl_Int64_Box_is_bounded : int64_box -> bool
val ppl_Int64_Box_contains_integer_point : int64_box -> bool
val ppl_Int64_Box_is_topologically_closed : int64_box -> bool
val ppl_Int64_Box_is_discrete : int64_box -> bool
val ppl_Int64_Box_topological_closure_assign : int64_box -> unit
val ppl_Int64_Box_bounds_from_above : int64_box -> linear_expression -> bool
val ppl_Int64_Box_bounds_from_below : int64_box -> linear_expression -> bool
val ppl_Int64_Box_maximize :
  int64_box ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int64_Box_minimize :
  int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Int64_Box_maximize_with_point :
  int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int64_Box_minimize_with_point :
  int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Int64_Box_frequency :
  int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Int64_Box_contains_Int64_Box : int64_box -> int64_box -> bool
val ppl_Int64_Box_strictly_contains_Int64_Box :
  int64_box -> int64_box -> bool
val ppl_Int64_Box_is_disjoint_from_Int64_Box : int64_box -> int64_box -> bool
val ppl_Int64_Box_equals_Int64_Box : int64_box -> int64_box -> bool
val ppl_Int64_Box_OK : int64_box -> bool
val ppl_Int64_Box_add_constraint : int64_box -> linear_constraint -> unit
val ppl_Int64_Box_add_congruence : int64_box -> linear_congruence -> unit
val ppl_Int64_Box_add_constraints : int64_box -> constraint_system -> unit
val ppl_Int64_Box_add_congruences : int64_box -> congruence_system -> unit
val ppl_Int64_Box_refine_with_constraint :
  int64_box -> linear_constraint -> unit
val ppl_Int64_Box_refine_with_congruence :
  int64_box -> linear_congruence -> unit
val ppl_Int64_Box_refine_with_constraints :
  int64_box -> constraint_system -> unit
val ppl_Int64_Box_refine_with_congruences :
  int64_box -> congruence_system -> unit
val ppl_Int64_Box_intersection_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_upper_bound_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_difference_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_concatenate_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_time_elapse_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_upper_bound_assign_if_exact :
  int64_box -> int64_box -> bool
val ppl_Int64_Box_simplify_using_context_assign :
  int64_box -> int64_box -> bool
val ppl_Int64_Box_constrains : int64_box -> int -> bool
val ppl_Int64_Box_unconstrain_space_dimension : int64_box -> int -> unit
val ppl_Int64_Box_unconstrain_space_dimensions :
  int64_box -> int list -> unit
val ppl_Int64_Box_affine_image :
```

```
  int64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_affine_preimage :
  int64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_bounded_affine_image :
  int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_bounded_affine_preimage :
  int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_generalized_affine_image :
  int64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_generalized_affine_preimage :
  int64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Int64_Box_generalized_affine_image_lhs_rhs :
  int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int64_Box_generalized_affine_preimage_lhs_rhs :
  int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Int64_Box_add_space_dimensions_and_embed : int64_box -> int -> unit
val ppl_Int64_Box_add_space_dimensions_and_project : int64_box -> int -> unit
val ppl_Int64_Box_remove_space_dimensions : int64_box -> int list -> unit
val ppl_Int64_Box_remove_higher_space_dimensions : int64_box -> int -> unit
val ppl_Int64_Box_expand_space_dimension : int64_box -> int -> int -> unit
val ppl_Int64_Box_fold_space_dimensions :
  int64_box -> int list -> int -> unit
val ppl_Int64_Box_map_space_dimensions :
  int64_box -> (int * int) list -> unit
val ppl_Int64_Box_drop_some_non_integer_points :
  int64_box -> complexity_class -> unit
val ppl_Int64_Box_drop_some_non_integer_points_2 :
  int64_box -> int list -> complexity_class -> unit
val ppl_Int64_Box_ascii_dump : int64_box -> string
val ppl_Int64_Box_external_memory_in_bytes : int64_box -> int
val ppl_Int64_Box_total_memory_in_bytes : int64_box -> int
val ppl_Int64_Box_CC76_widening_assign_with_tokens :
  int64_box -> int64_box -> int -> int
val ppl_Int64_Box_CC76_widening_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_widening_assign_with_tokens :
  int64_box -> int64_box -> int -> int
```

```
val ppl_Int64_Box_widening_assign : int64_box -> int64_box -> unit
val ppl_Int64_Box_limited_CC76_extrapolation_assign_with_tokens :
  int64_box ->
  int64_box -> constraint_system -> int -> int
val ppl_Int64_Box_limited_CC76_extrapolation_assign :
  int64_box ->
  int64_box -> constraint_system -> unit
val ppl_Int64_Box_linear_partition :
  int64_box ->
  int64_box ->
  int64_box * pointset_powerset_nnc_polyhedron
val ppl_Int64_Box_wrap_assign :
  int64_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Int64_Box : int64_box -> bool
val ppl_termination_test_PR_Int64_Box : int64_box -> bool
val ppl_one_affine_ranking_function_MS_Int64_Box :
  int64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int64_Box :
  int64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int64_Box : int64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int64_Box : int64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int64_Box :
  int64_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Int64_Box_2 : int64_box -> int64_box -> bool
val ppl_termination_test_PR_Int64_Box_2 : int64_box -> int64_box -> bool
val ppl_one_affine_ranking_function_MS_Int64_Box_2 :
  int64_box ->
  int64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Int64_Box_2 :
  int64_box ->
  int64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Int64_Box_2 :
  int64_box -> int64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Int64_Box_2 :
  int64_box -> int64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Int64_Box_2 :
  int64_box ->
  int64_box -> polyhedron * polyhedron
val ppl_new_Uint8_Box_from_space_dimension :
  int -> degenerate_element -> uint8_box
val ppl_new_Uint8_Box_from_Int8_Box : int8_box -> uint8_box
val ppl_new_Uint8_Box_from_Int16_Box : int16_box -> uint8_box
val ppl_new_Uint8_Box_from_Int32_Box : int32_box -> uint8_box
```

```
val ppl_new_Uint8_Box_from_Int64_Box : int64_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint8_Box : uint8_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint16_Box : uint16_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint32_Box : uint32_box -> uint8_box
val ppl_new_Uint8_Box_from_Uint64_Box : uint64_box -> uint8_box
val ppl_new_Uint8_Box_from_Z_Box : z_box -> uint8_box
val ppl_new_Uint8_Box_from_Rational_Box : rational_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint8_box
val ppl_new_Uint8_Box_from_C_Polyhedron : polyhedron -> uint8_box
val ppl_new_Uint8_Box_from_NNC_Polyhedron : polyhedron -> uint8_box
val ppl_new_Uint8_Box_from_Grid : grid -> uint8_box
val ppl_new_Uint8_Box_from_Float_Box : float_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_float : bd_shape_float -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint8_box
val ppl_new_Uint8_Box_from_Double_Box : double_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_double : bd_shape_double -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint8_box
val ppl_new_Uint8_Box_from_Long_Double_Box : long_double_box -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint8_box
val ppl_new_Uint8_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Int16_Box_with_complexity :
```

```
  int16_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
```

```
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> uint8_box
val ppl_new_Uint8_Box_from_constraints : constraint_system -> uint8_box
val ppl_new_Uint8_Box_from_congruences : congruence_system -> uint8_box
val ppl_new_Uint8_Box_from_generators : generator_system -> uint8_box
val ppl_Uint8_Box_swap : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_space_dimension : uint8_box -> int
val ppl_Uint8_Box_affine_dimension : uint8_box -> int
val ppl_Uint8_Box_relation_with_constraint :
  uint8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint8_Box_relation_with_generator :
  uint8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint8_Box_relation_with_congruence :
  uint8_box ->
  linear_congruence -> poly_con_relation list
```

```
val ppl_Uint8_Box_get_constraints : uint8_box -> constraint_system
val ppl_Uint8_Box_get_congruences : uint8_box -> congruence_system
val ppl_Uint8_Box_get_minimized_constraints : uint8_box -> constraint_system
val ppl_Uint8_Box_get_minimized_congruences : uint8_box -> congruence_system
val ppl_Uint8_Box_is_empty : uint8_box -> bool
val ppl_Uint8_Box_is_universe : uint8_box -> bool
val ppl_Uint8_Box_is_bounded : uint8_box -> bool
val ppl_Uint8_Box_contains_integer_point : uint8_box -> bool
val ppl_Uint8_Box_is_topologically_closed : uint8_box -> bool
val ppl_Uint8_Box_is_discrete : uint8_box -> bool
val ppl_Uint8_Box_topological_closure_assign : uint8_box -> unit
val ppl_Uint8_Box_bounds_from_above : uint8_box -> linear_expression -> bool
val ppl_Uint8_Box_bounds_from_below : uint8_box -> linear_expression -> bool
val ppl_Uint8_Box_maximize :
  uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint8_Box_minimize :
  uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint8_Box_maximize_with_point :
  uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint8_Box_minimize_with_point :
  uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint8_Box_frequency :
  uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint8_Box_contains_Uint8_Box : uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_strictly_contains_Uint8_Box :
  uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_is_disjoint_from_Uint8_Box : uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_equals_Uint8_Box : uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_OK : uint8_box -> bool
val ppl_Uint8_Box_add_constraint : uint8_box -> linear_constraint -> unit
val ppl_Uint8_Box_add_congruence : uint8_box -> linear_congruence -> unit
val ppl_Uint8_Box_add_constraints : uint8_box -> constraint_system -> unit
val ppl_Uint8_Box_add_congruences : uint8_box -> congruence_system -> unit
val ppl_Uint8_Box_refine_with_constraint :
  uint8_box -> linear_constraint -> unit
val ppl_Uint8_Box_refine_with_congruence :
  uint8_box -> linear_congruence -> unit
val ppl_Uint8_Box_refine_with_constraints :
  uint8_box -> constraint_system -> unit
val ppl_Uint8_Box_refine_with_congruences :
```

```
  uint8_box -> congruence_system -> unit
val ppl_Uint8_Box_intersection_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_upper_bound_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_difference_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_concatenate_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_time_elapse_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_upper_bound_assign_if_exact :
  uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_simplify_using_context_assign :
  uint8_box -> uint8_box -> bool
val ppl_Uint8_Box_constrains : uint8_box -> int -> bool
val ppl_Uint8_Box_unconstrain_space_dimension : uint8_box -> int -> unit
val ppl_Uint8_Box_unconstrain_space_dimensions :
  uint8_box -> int list -> unit
val ppl_Uint8_Box_affine_image :
  uint8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_affine_preimage :
  uint8_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_bounded_affine_image :
  uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_bounded_affine_preimage :
  uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_generalized_affine_image :
  uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_generalized_affine_preimage :
  uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint8_Box_generalized_affine_image_lhs_rhs :
  uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint8_Box_generalized_affine_preimage_lhs_rhs :
  uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint8_Box_add_space_dimensions_and_embed : uint8_box -> int -> unit
val ppl_Uint8_Box_add_space_dimensions_and_project : uint8_box -> int -> unit
val ppl_Uint8_Box_remove_space_dimensions : uint8_box -> int list -> unit
val ppl_Uint8_Box_remove_higher_space_dimensions : uint8_box -> int -> unit
val ppl_Uint8_Box_expand_space_dimension : uint8_box -> int -> int -> unit
val ppl_Uint8_Box_fold_space_dimensions :
```

```
  uint8_box -> int list -> int -> unit
val ppl_Uint8_Box_map_space_dimensions :
  uint8_box -> (int * int) list -> unit
val ppl_Uint8_Box_drop_some_non_integer_points :
  uint8_box -> complexity_class -> unit
val ppl_Uint8_Box_drop_some_non_integer_points_2 :
  uint8_box -> int list -> complexity_class -> unit
val ppl_Uint8_Box_ascii_dump : uint8_box -> string
val ppl_Uint8_Box_external_memory_in_bytes : uint8_box -> int
val ppl_Uint8_Box_total_memory_in_bytes : uint8_box -> int
val ppl_Uint8_Box_CC76_widening_assign_with_tokens :
  uint8_box -> uint8_box -> int -> int
val ppl_Uint8_Box_CC76_widening_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_widening_assign_with_tokens :
  uint8_box -> uint8_box -> int -> int
val ppl_Uint8_Box_widening_assign : uint8_box -> uint8_box -> unit
val ppl_Uint8_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint8_box ->
  uint8_box -> constraint_system -> int -> int
val ppl_Uint8_Box_limited_CC76_extrapolation_assign :
  uint8_box ->
  uint8_box -> constraint_system -> unit
val ppl_Uint8_Box_linear_partition :
  uint8_box ->
  uint8_box ->
  uint8_box * pointset_powerset_nnc_polyhedron
val ppl_Uint8_Box_wrap_assign :
  uint8_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Uint8_Box : uint8_box -> bool
val ppl_termination_test_PR_Uint8_Box : uint8_box -> bool
val ppl_one_affine_ranking_function_MS_Uint8_Box :
  uint8_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint8_Box :
  uint8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint8_Box : uint8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint8_Box : uint8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint8_Box :
  uint8_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint8_Box_2 : uint8_box -> uint8_box -> bool
val ppl_termination_test_PR_Uint8_Box_2 : uint8_box -> uint8_box -> bool
val ppl_one_affine_ranking_function_MS_Uint8_Box_2 :
  uint8_box ->
  uint8_box -> bool * linear_generator
```

```
val ppl_one_affine_ranking_function_PR_Uint8_Box_2 :
  uint8_box ->
  uint8_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint8_Box_2 :
  uint8_box -> uint8_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint8_Box_2 :
  uint8_box -> uint8_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint8_Box_2 :
  uint8_box ->
  uint8_box -> polyhedron * polyhedron
val ppl_new_Uint16_Box_from_space_dimension :
  int -> degenerate_element -> uint16_box
val ppl_new_Uint16_Box_from_Int8_Box : int8_box -> uint16_box
val ppl_new_Uint16_Box_from_Int16_Box : int16_box -> uint16_box
val ppl_new_Uint16_Box_from_Int32_Box : int32_box -> uint16_box
val ppl_new_Uint16_Box_from_Int64_Box : int64_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint8_Box : uint8_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint16_Box : uint16_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint32_Box : uint32_box -> uint16_box
val ppl_new_Uint16_Box_from_Uint64_Box : uint64_box -> uint16_box
val ppl_new_Uint16_Box_from_Z_Box : z_box -> uint16_box
val ppl_new_Uint16_Box_from_Rational_Box : rational_box -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint16_box
val ppl_new_Uint16_Box_from_C_Polyhedron : polyhedron -> uint16_box
val ppl_new_Uint16_Box_from_NNC_Polyhedron : polyhedron -> uint16_box
val ppl_new_Uint16_Box_from_Grid : grid -> uint16_box
val ppl_new_Uint16_Box_from_Float_Box : float_box -> uint16_box
```

```
val ppl_new_Uint16_Box_from_BD_Shape_float : bd_shape_float -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint16_box
val ppl_new_Uint16_Box_from_Double_Box : double_box -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_double : bd_shape_double -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint16_box
val ppl_new_Uint16_Box_from_Long_Double_Box : long_double_box -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint16_box
val ppl_new_Uint16_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_mpq_class_with_complexity :
```

```
  bd_shape_mpq_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
```

```
  complexity_class -> uint16_box
val ppl_new_Uint16_Box_from_constraints : constraint_system -> uint16_box
val ppl_new_Uint16_Box_from_congruences : congruence_system -> uint16_box
val ppl_new_Uint16_Box_from_generators : generator_system -> uint16_box
val ppl_Uint16_Box_swap : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_space_dimension : uint16_box -> int
val ppl_Uint16_Box_affine_dimension : uint16_box -> int
val ppl_Uint16_Box_relation_with_constraint :
  uint16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint16_Box_relation_with_generator :
  uint16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint16_Box_relation_with_congruence :
  uint16_box ->
  linear_congruence -> poly_con_relation list
val ppl_Uint16_Box_get_constraints : uint16_box -> constraint_system
val ppl_Uint16_Box_get_congruences : uint16_box -> congruence_system
val ppl_Uint16_Box_get_minimized_constraints :
  uint16_box -> constraint_system
val ppl_Uint16_Box_get_minimized_congruences :
  uint16_box -> congruence_system
val ppl_Uint16_Box_is_empty : uint16_box -> bool
val ppl_Uint16_Box_is_universe : uint16_box -> bool
val ppl_Uint16_Box_is_bounded : uint16_box -> bool
val ppl_Uint16_Box_contains_integer_point : uint16_box -> bool
val ppl_Uint16_Box_is_topologically_closed : uint16_box -> bool
val ppl_Uint16_Box_is_discrete : uint16_box -> bool
val ppl_Uint16_Box_topological_closure_assign : uint16_box -> unit
val ppl_Uint16_Box_bounds_from_above :
  uint16_box -> linear_expression -> bool
val ppl_Uint16_Box_bounds_from_below :
  uint16_box -> linear_expression -> bool
val ppl_Uint16_Box_maximize :
  uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint16_Box_minimize :
  uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint16_Box_maximize_with_point :
  uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint16_Box_minimize_with_point :
  uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
```

```
val ppl_Uint16_Box_frequency :
  uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint16_Box_contains_Uint16_Box : uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_strictly_contains_Uint16_Box :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_is_disjoint_from_Uint16_Box :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_equals_Uint16_Box : uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_OK : uint16_box -> bool
val ppl_Uint16_Box_add_constraint : uint16_box -> linear_constraint -> unit
val ppl_Uint16_Box_add_congruence : uint16_box -> linear_congruence -> unit
val ppl_Uint16_Box_add_constraints : uint16_box -> constraint_system -> unit
val ppl_Uint16_Box_add_congruences : uint16_box -> congruence_system -> unit
val ppl_Uint16_Box_refine_with_constraint :
  uint16_box -> linear_constraint -> unit
val ppl_Uint16_Box_refine_with_congruence :
  uint16_box -> linear_congruence -> unit
val ppl_Uint16_Box_refine_with_constraints :
  uint16_box -> constraint_system -> unit
val ppl_Uint16_Box_refine_with_congruences :
  uint16_box -> congruence_system -> unit
val ppl_Uint16_Box_intersection_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_upper_bound_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_difference_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_concatenate_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_time_elapse_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_upper_bound_assign_if_exact :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_simplify_using_context_assign :
  uint16_box -> uint16_box -> bool
val ppl_Uint16_Box_constrains : uint16_box -> int -> bool
val ppl_Uint16_Box_unconstrain_space_dimension : uint16_box -> int -> unit
val ppl_Uint16_Box_unconstrain_space_dimensions :
  uint16_box -> int list -> unit
val ppl_Uint16_Box_affine_image :
  uint16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_affine_preimage :
  uint16_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_bounded_affine_image :
  uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_bounded_affine_preimage :
  uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Uint16_Box_generalized_affine_image :
  uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_generalized_affine_preimage :
  uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint16_Box_generalized_affine_image_lhs_rhs :
  uint16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint16_Box_generalized_affine_preimage_lhs_rhs :
  uint16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint16_Box_add_space_dimensions_and_embed : uint16_box -> int -> unit
val ppl_Uint16_Box_add_space_dimensions_and_project :
  uint16_box -> int -> unit
val ppl_Uint16_Box_remove_space_dimensions : uint16_box -> int list -> unit
val ppl_Uint16_Box_remove_higher_space_dimensions : uint16_box -> int -> unit
val ppl_Uint16_Box_expand_space_dimension : uint16_box -> int -> int -> unit
val ppl_Uint16_Box_fold_space_dimensions :
  uint16_box -> int list -> int -> unit
val ppl_Uint16_Box_map_space_dimensions :
  uint16_box -> (int * int) list -> unit
val ppl_Uint16_Box_drop_some_non_integer_points :
  uint16_box -> complexity_class -> unit
val ppl_Uint16_Box_drop_some_non_integer_points_2 :
  uint16_box -> int list -> complexity_class -> unit
val ppl_Uint16_Box_ascii_dump : uint16_box -> string
val ppl_Uint16_Box_external_memory_in_bytes : uint16_box -> int
val ppl_Uint16_Box_total_memory_in_bytes : uint16_box -> int
val ppl_Uint16_Box_CC76_widening_assign_with_tokens :
  uint16_box -> uint16_box -> int -> int
val ppl_Uint16_Box_CC76_widening_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_widening_assign_with_tokens :
  uint16_box -> uint16_box -> int -> int
val ppl_Uint16_Box_widening_assign : uint16_box -> uint16_box -> unit
val ppl_Uint16_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint16_box ->
  uint16_box -> constraint_system -> int -> int
val ppl_Uint16_Box_limited_CC76_extrapolation_assign :
  uint16_box ->
  uint16_box -> constraint_system -> unit
val ppl_Uint16_Box_linear_partition :
  uint16_box ->
  uint16_box ->
  uint16_box * pointset_powerset_nnc_polyhedron
```

```
val ppl_Uint16_Box_wrap_assign :
  uint16_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Uint16_Box : uint16_box -> bool
val ppl_termination_test_PR_Uint16_Box : uint16_box -> bool
val ppl_one_affine_ranking_function_MS_Uint16_Box :
  uint16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint16_Box :
  uint16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint16_Box : uint16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint16_Box : uint16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box :
  uint16_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint16_Box_2 : uint16_box -> uint16_box -> bool
val ppl_termination_test_PR_Uint16_Box_2 : uint16_box -> uint16_box -> bool
val ppl_one_affine_ranking_function_MS_Uint16_Box_2 :
  uint16_box ->
  uint16_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint16_Box_2 :
  uint16_box ->
  uint16_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint16_Box_2 :
  uint16_box -> uint16_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint16_Box_2 :
  uint16_box -> uint16_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint16_Box_2 :
  uint16_box ->
  uint16_box -> polyhedron * polyhedron
val ppl_new_Uint32_Box_from_space_dimension :
  int -> degenerate_element -> uint32_box
val ppl_new_Uint32_Box_from_Int8_Box : int8_box -> uint32_box
val ppl_new_Uint32_Box_from_Int16_Box : int16_box -> uint32_box
val ppl_new_Uint32_Box_from_Int32_Box : int32_box -> uint32_box
val ppl_new_Uint32_Box_from_Int64_Box : int64_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint8_Box : uint8_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint16_Box : uint16_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint32_Box : uint32_box -> uint32_box
val ppl_new_Uint32_Box_from_Uint64_Box : uint64_box -> uint32_box
val ppl_new_Uint32_Box_from_Z_Box : z_box -> uint32_box
val ppl_new_Uint32_Box_from_Rational_Box : rational_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint32_box
```

```
val ppl_new_Uint32_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint32_box
val ppl_new_Uint32_Box_from_C_Polyhedron : polyhedron -> uint32_box
val ppl_new_Uint32_Box_from_NNC_Polyhedron : polyhedron -> uint32_box
val ppl_new_Uint32_Box_from_Grid : grid -> uint32_box
val ppl_new_Uint32_Box_from_Float_Box : float_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_float : bd_shape_float -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint32_box
val ppl_new_Uint32_Box_from_Double_Box : double_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_double : bd_shape_double -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint32_box
val ppl_new_Uint32_Box_from_Long_Double_Box : long_double_box -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint32_box
val ppl_new_Uint32_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint32_box
```

```
val ppl_new_Uint32_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint32_box
```

```
val ppl_new_Uint32_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> uint32_box
val ppl_new_Uint32_Box_from_constraints : constraint_system -> uint32_box
val ppl_new_Uint32_Box_from_congruences : congruence_system -> uint32_box
val ppl_new_Uint32_Box_from_generators : generator_system -> uint32_box
val ppl_Uint32_Box_swap : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_space_dimension : uint32_box -> int
val ppl_Uint32_Box_affine_dimension : uint32_box -> int
val ppl_Uint32_Box_relation_with_constraint :
  uint32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint32_Box_relation_with_generator :
  uint32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint32_Box_relation_with_congruence :
  uint32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Uint32_Box_get_constraints : uint32_box -> constraint_system
val ppl_Uint32_Box_get_congruences : uint32_box -> congruence_system
val ppl_Uint32_Box_get_minimized_constraints :
  uint32_box -> constraint_system
val ppl_Uint32_Box_get_minimized_congruences :
  uint32_box -> congruence_system
val ppl_Uint32_Box_is_empty : uint32_box -> bool
val ppl_Uint32_Box_is_universe : uint32_box -> bool
val ppl_Uint32_Box_is_bounded : uint32_box -> bool
val ppl_Uint32_Box_contains_integer_point : uint32_box -> bool
```

```
val ppl_Uint32_Box_is_topologically_closed : uint32_box -> bool
val ppl_Uint32_Box_is_discrete : uint32_box -> bool
val ppl_Uint32_Box_topological_closure_assign : uint32_box -> unit
val ppl_Uint32_Box_bounds_from_above :
  uint32_box -> linear_expression -> bool
val ppl_Uint32_Box_bounds_from_below :
  uint32_box -> linear_expression -> bool
val ppl_Uint32_Box_maximize :
  uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint32_Box_minimize :
  uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint32_Box_maximize_with_point :
  uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint32_Box_minimize_with_point :
  uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint32_Box_frequency :
  uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint32_Box_contains_Uint32_Box : uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_strictly_contains_Uint32_Box :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_is_disjoint_from_Uint32_Box :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_equals_Uint32_Box : uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_OK : uint32_box -> bool
val ppl_Uint32_Box_add_constraint : uint32_box -> linear_constraint -> unit
val ppl_Uint32_Box_add_congruence : uint32_box -> linear_congruence -> unit
val ppl_Uint32_Box_add_constraints : uint32_box -> constraint_system -> unit
val ppl_Uint32_Box_add_congruences : uint32_box -> congruence_system -> unit
val ppl_Uint32_Box_refine_with_constraint :
  uint32_box -> linear_constraint -> unit
val ppl_Uint32_Box_refine_with_congruence :
  uint32_box -> linear_congruence -> unit
val ppl_Uint32_Box_refine_with_constraints :
  uint32_box -> constraint_system -> unit
val ppl_Uint32_Box_refine_with_congruences :
  uint32_box -> congruence_system -> unit
val ppl_Uint32_Box_intersection_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_upper_bound_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_difference_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_concatenate_assign : uint32_box -> uint32_box -> unit
```

```
val ppl_Uint32_Box_time_elapse_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_upper_bound_assign_if_exact :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_simplify_using_context_assign :
  uint32_box -> uint32_box -> bool
val ppl_Uint32_Box_constrains : uint32_box -> int -> bool
val ppl_Uint32_Box_unconstrain_space_dimension : uint32_box -> int -> unit
val ppl_Uint32_Box_unconstrain_space_dimensions :
  uint32_box -> int list -> unit
val ppl_Uint32_Box_affine_image :
  uint32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_affine_preimage :
  uint32_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_bounded_affine_image :
  uint32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_bounded_affine_preimage :
  uint32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_generalized_affine_image :
  uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_generalized_affine_preimage :
  uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint32_Box_generalized_affine_image_lhs_rhs :
  uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint32_Box_generalized_affine_preimage_lhs_rhs :
  uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint32_Box_add_space_dimensions_and_embed : uint32_box -> int -> unit
val ppl_Uint32_Box_add_space_dimensions_and_project :
  uint32_box -> int -> unit
val ppl_Uint32_Box_remove_space_dimensions : uint32_box -> int list -> unit
val ppl_Uint32_Box_remove_higher_space_dimensions : uint32_box -> int -> unit
val ppl_Uint32_Box_expand_space_dimension : uint32_box -> int -> int -> unit
val ppl_Uint32_Box_fold_space_dimensions :
  uint32_box -> int list -> int -> unit
val ppl_Uint32_Box_map_space_dimensions :
  uint32_box -> (int * int) list -> unit
val ppl_Uint32_Box_drop_some_non_integer_points :
  uint32_box -> complexity_class -> unit
```

```
val ppl_Uint32_Box_drop_some_non_integer_points_2 :
  uint32_box -> int list -> complexity_class -> unit
val ppl_Uint32_Box_ascii_dump : uint32_box -> string
val ppl_Uint32_Box_external_memory_in_bytes : uint32_box -> int
val ppl_Uint32_Box_total_memory_in_bytes : uint32_box -> int
val ppl_Uint32_Box_CC76_widening_assign_with_tokens :
  uint32_box -> uint32_box -> int -> int
val ppl_Uint32_Box_CC76_widening_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_widening_assign_with_tokens :
  uint32_box -> uint32_box -> int -> int
val ppl_Uint32_Box_widening_assign : uint32_box -> uint32_box -> unit
val ppl_Uint32_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint32_box ->
  uint32_box -> constraint_system -> int -> int
val ppl_Uint32_Box_limited_CC76_extrapolation_assign :
  uint32_box ->
  uint32_box -> constraint_system -> unit
val ppl_Uint32_Box_linear_partition :
  uint32_box ->
  uint32_box ->
  uint32_box * pointset_powerset_nnc_polyhedron
val ppl_Uint32_Box_wrap_assign :
  uint32_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Uint32_Box : uint32_box -> bool
val ppl_termination_test_PR_Uint32_Box : uint32_box -> bool
val ppl_one_affine_ranking_function_MS_Uint32_Box :
  uint32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint32_Box :
  uint32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint32_Box : uint32_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint32_Box : uint32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint32_Box :
  uint32_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint32_Box_2 : uint32_box -> uint32_box -> bool
val ppl_termination_test_PR_Uint32_Box_2 : uint32_box -> uint32_box -> bool
val ppl_one_affine_ranking_function_MS_Uint32_Box_2 :
  uint32_box ->
  uint32_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint32_Box_2 :
  uint32_box ->
  uint32_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint32_Box_2 :
  uint32_box -> uint32_box -> polyhedron
```

```
val ppl_all_affine_ranking_functions_PR_Uint32_Box_2 :
  uint32_box -> uint32_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint32_Box_2 :
  uint32_box ->
  uint32_box -> polyhedron * polyhedron
val ppl_new_Uint64_Box_from_space_dimension :
  int -> degenerate_element -> uint64_box
val ppl_new_Uint64_Box_from_Int8_Box : int8_box -> uint64_box
val ppl_new_Uint64_Box_from_Int16_Box : int16_box -> uint64_box
val ppl_new_Uint64_Box_from_Int32_Box : int32_box -> uint64_box
val ppl_new_Uint64_Box_from_Int64_Box : int64_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint8_Box : uint8_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint16_Box : uint16_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint32_Box : uint32_box -> uint64_box
val ppl_new_Uint64_Box_from_Uint64_Box : uint64_box -> uint64_box
val ppl_new_Uint64_Box_from_Z_Box : z_box -> uint64_box
val ppl_new_Uint64_Box_from_Rational_Box : rational_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> uint64_box
val ppl_new_Uint64_Box_from_C_Polyhedron : polyhedron -> uint64_box
val ppl_new_Uint64_Box_from_NNC_Polyhedron : polyhedron -> uint64_box
val ppl_new_Uint64_Box_from_Grid : grid -> uint64_box
val ppl_new_Uint64_Box_from_Float_Box : float_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_float : bd_shape_float -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> uint64_box
val ppl_new_Uint64_Box_from_Double_Box : double_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_double : bd_shape_double -> uint64_box
```

```
val ppl_new_Uint64_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> uint64_box
val ppl_new_Uint64_Box_from_Long_Double_Box : long_double_box -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> uint64_box
val ppl_new_Uint64_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int16_t_with_complexity :
```

```
  octagonal_shape_int16_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Grid_with_complexity :
  grid -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> uint64_box
val ppl_new_Uint64_Box_from_constraints : constraint_system -> uint64_box
val ppl_new_Uint64_Box_from_congruences : congruence_system -> uint64_box
val ppl_new_Uint64_Box_from_generators : generator_system -> uint64_box
val ppl_Uint64_Box_swap : uint64_box -> uint64_box -> unit
```

```
val ppl_Uint64_Box_space_dimension : uint64_box -> int
val ppl_Uint64_Box_affine_dimension : uint64_box -> int
val ppl_Uint64_Box_relation_with_constraint :
  uint64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Uint64_Box_relation_with_generator :
  uint64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Uint64_Box_relation_with_congruence :
  uint64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Uint64_Box_get_constraints : uint64_box -> constraint_system
val ppl_Uint64_Box_get_congruences : uint64_box -> congruence_system
val ppl_Uint64_Box_get_minimized_constraints :
  uint64_box -> constraint_system
val ppl_Uint64_Box_get_minimized_congruences :
  uint64_box -> congruence_system
val ppl_Uint64_Box_is_empty : uint64_box -> bool
val ppl_Uint64_Box_is_universe : uint64_box -> bool
val ppl_Uint64_Box_is_bounded : uint64_box -> bool
val ppl_Uint64_Box_contains_integer_point : uint64_box -> bool
val ppl_Uint64_Box_is_topologically_closed : uint64_box -> bool
val ppl_Uint64_Box_is_discrete : uint64_box -> bool
val ppl_Uint64_Box_topological_closure_assign : uint64_box -> unit
val ppl_Uint64_Box_bounds_from_above :
  uint64_box -> linear_expression -> bool
val ppl_Uint64_Box_bounds_from_below :
  uint64_box -> linear_expression -> bool
val ppl_Uint64_Box_maximize :
  uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint64_Box_minimize :
  uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Uint64_Box_maximize_with_point :
  uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint64_Box_minimize_with_point :
  uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Uint64_Box_frequency :
  uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Uint64_Box_contains_Uint64_Box : uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_strictly_contains_Uint64_Box :
  uint64_box -> uint64_box -> bool
```

```
val ppl_Uint64_Box_is_disjoint_from_Uint64_Box :
  uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_equals_Uint64_Box : uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_OK : uint64_box -> bool
val ppl_Uint64_Box_add_constraint : uint64_box -> linear_constraint -> unit
val ppl_Uint64_Box_add_congruence : uint64_box -> linear_congruence -> unit
val ppl_Uint64_Box_add_constraints : uint64_box -> constraint_system -> unit
val ppl_Uint64_Box_add_congruences : uint64_box -> congruence_system -> unit
val ppl_Uint64_Box_refine_with_constraint :
  uint64_box -> linear_constraint -> unit
val ppl_Uint64_Box_refine_with_congruence :
  uint64_box -> linear_congruence -> unit
val ppl_Uint64_Box_refine_with_constraints :
  uint64_box -> constraint_system -> unit
val ppl_Uint64_Box_refine_with_congruences :
  uint64_box -> congruence_system -> unit
val ppl_Uint64_Box_intersection_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_upper_bound_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_difference_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_concatenate_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_time_elapse_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_upper_bound_assign_if_exact :
  uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_simplify_using_context_assign :
  uint64_box -> uint64_box -> bool
val ppl_Uint64_Box_constrains : uint64_box -> int -> bool
val ppl_Uint64_Box_unconstrain_space_dimension : uint64_box -> int -> unit
val ppl_Uint64_Box_unconstrain_space_dimensions :
  uint64_box -> int list -> unit
val ppl_Uint64_Box_affine_image :
  uint64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_affine_preimage :
  uint64_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_bounded_affine_image :
  uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_bounded_affine_preimage :
  uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_generalized_affine_image :
  uint64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_generalized_affine_preimage :
  uint64_box ->
  int ->
```

```
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Uint64_Box_generalized_affine_image_lhs_rhs :
  uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint64_Box_generalized_affine_preimage_lhs_rhs :
  uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Uint64_Box_add_space_dimensions_and_embed : uint64_box -> int -> unit
val ppl_Uint64_Box_add_space_dimensions_and_project :
  uint64_box -> int -> unit
val ppl_Uint64_Box_remove_space_dimensions : uint64_box -> int list -> unit
val ppl_Uint64_Box_remove_higher_space_dimensions : uint64_box -> int -> unit
val ppl_Uint64_Box_expand_space_dimension : uint64_box -> int -> int -> unit
val ppl_Uint64_Box_fold_space_dimensions :
  uint64_box -> int list -> int -> unit
val ppl_Uint64_Box_map_space_dimensions :
  uint64_box -> (int * int) list -> unit
val ppl_Uint64_Box_drop_some_non_integer_points :
  uint64_box -> complexity_class -> unit
val ppl_Uint64_Box_drop_some_non_integer_points_2 :
  uint64_box -> int list -> complexity_class -> unit
val ppl_Uint64_Box_ascii_dump : uint64_box -> string
val ppl_Uint64_Box_external_memory_in_bytes : uint64_box -> int
val ppl_Uint64_Box_total_memory_in_bytes : uint64_box -> int
val ppl_Uint64_Box_CC76_widening_assign_with_tokens :
  uint64_box -> uint64_box -> int -> int
val ppl_Uint64_Box_CC76_widening_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_widening_assign_with_tokens :
  uint64_box -> uint64_box -> int -> int
val ppl_Uint64_Box_widening_assign : uint64_box -> uint64_box -> unit
val ppl_Uint64_Box_limited_CC76_extrapolation_assign_with_tokens :
  uint64_box ->
  uint64_box -> constraint_system -> int -> int
val ppl_Uint64_Box_limited_CC76_extrapolation_assign :
  uint64_box ->
  uint64_box -> constraint_system -> unit
val ppl_Uint64_Box_linear_partition :
  uint64_box ->
  uint64_box ->
  uint64_box * pointset_powerset_nnc_polyhedron
val ppl_Uint64_Box_wrap_assign :
  uint64_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
```

```
val ppl_termination_test_MS_Uint64_Box : uint64_box -> bool
val ppl_termination_test_PR_Uint64_Box : uint64_box -> bool
val ppl_one_affine_ranking_function_MS_Uint64_Box :
  uint64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint64_Box :
  uint64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint64_Box : uint64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint64_Box : uint64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint64_Box :
  uint64_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Uint64_Box_2 : uint64_box -> uint64_box -> bool
val ppl_termination_test_PR_Uint64_Box_2 : uint64_box -> uint64_box -> bool
val ppl_one_affine_ranking_function_MS_Uint64_Box_2 :
  uint64_box ->
  uint64_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Uint64_Box_2 :
  uint64_box ->
  uint64_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Uint64_Box_2 :
  uint64_box -> uint64_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Uint64_Box_2 :
  uint64_box -> uint64_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Uint64_Box_2 :
  uint64_box ->
  uint64_box -> polyhedron * polyhedron
val ppl_new_Z_Box_from_space_dimension : int -> degenerate_element -> z_box
val ppl_new_Z_Box_from_Int8_Box : int8_box -> z_box
val ppl_new_Z_Box_from_Int16_Box : int16_box -> z_box
val ppl_new_Z_Box_from_Int32_Box : int32_box -> z_box
val ppl_new_Z_Box_from_Int64_Box : int64_box -> z_box
val ppl_new_Z_Box_from_Uint8_Box : uint8_box -> z_box
val ppl_new_Z_Box_from_Uint16_Box : uint16_box -> z_box
val ppl_new_Z_Box_from_Uint32_Box : uint32_box -> z_box
val ppl_new_Z_Box_from_Uint64_Box : uint64_box -> z_box
val ppl_new_Z_Box_from_Z_Box : z_box -> z_box
val ppl_new_Z_Box_from_Rational_Box : rational_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpz_class : bd_shape_mpz_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpq_class : bd_shape_mpq_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> z_box
```

```
val ppl_new_Z_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> z_box
val ppl_new_Z_Box_from_C_Polyhedron : polyhedron -> z_box
val ppl_new_Z_Box_from_NNC_Polyhedron : polyhedron -> z_box
val ppl_new_Z_Box_from_Grid : grid -> z_box
val ppl_new_Z_Box_from_Float_Box : float_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_float : bd_shape_float -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_float : octagonal_shape_float -> z_box
val ppl_new_Z_Box_from_Double_Box : double_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_double : bd_shape_double -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> z_box
val ppl_new_Z_Box_from_Long_Double_Box : long_double_box -> z_box
val ppl_new_Z_Box_from_BD_Shape_long_double : bd_shape_long_double -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> z_box
val ppl_new_Z_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int32_t_with_complexity :
```

```
  bd_shape_int32_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class -> complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> z_box
val ppl_new_Z_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> z_box
val ppl_new_Z_Box_from_Grid_with_complexity :
  grid -> complexity_class -> z_box
val ppl_new_Z_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double -> complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_Long_Double_Box_with_complexity :
  long_double_box -> complexity_class -> z_box
val ppl_new_Z_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
```

```
  complexity_class -> z_box
val ppl_new_Z_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> z_box
val ppl_new_Z_Box_from_constraints : constraint_system -> z_box
val ppl_new_Z_Box_from_congruences : congruence_system -> z_box
val ppl_new_Z_Box_from_generators : generator_system -> z_box
val ppl_Z_Box_swap : z_box -> z_box -> unit
val ppl_Z_Box_space_dimension : z_box -> int
val ppl_Z_Box_affine_dimension : z_box -> int
val ppl_Z_Box_relation_with_constraint :
  z_box ->
  linear_constraint -> poly_con_relation list
val ppl_Z_Box_relation_with_generator :
  z_box ->
  linear_generator -> poly_gen_relation list
val ppl_Z_Box_relation_with_congruence :
  z_box ->
  linear_congruence -> poly_con_relation list
val ppl_Z_Box_get_constraints : z_box -> constraint_system
val ppl_Z_Box_get_congruences : z_box -> congruence_system
val ppl_Z_Box_get_minimized_constraints : z_box -> constraint_system
val ppl_Z_Box_get_minimized_congruences : z_box -> congruence_system
val ppl_Z_Box_is_empty : z_box -> bool
val ppl_Z_Box_is_universe : z_box -> bool
val ppl_Z_Box_is_bounded : z_box -> bool
val ppl_Z_Box_contains_integer_point : z_box -> bool
val ppl_Z_Box_is_topologically_closed : z_box -> bool
val ppl_Z_Box_is_discrete : z_box -> bool
val ppl_Z_Box_topological_closure_assign : z_box -> unit
val ppl_Z_Box_bounds_from_above : z_box -> linear_expression -> bool
val ppl_Z_Box_bounds_from_below : z_box -> linear_expression -> bool
val ppl_Z_Box_maximize :
  z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Z_Box_minimize :
  z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Z_Box_maximize_with_point :
  z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Z_Box_minimize_with_point :
  z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Z_Box_frequency :
```

```
  z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Z_Box_contains_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_strictly_contains_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_is_disjoint_from_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_equals_Z_Box : z_box -> z_box -> bool
val ppl_Z_Box_OK : z_box -> bool
val ppl_Z_Box_add_constraint : z_box -> linear_constraint -> unit
val ppl_Z_Box_add_congruence : z_box -> linear_congruence -> unit
val ppl_Z_Box_add_constraints : z_box -> constraint_system -> unit
val ppl_Z_Box_add_congruences : z_box -> congruence_system -> unit
val ppl_Z_Box_refine_with_constraint : z_box -> linear_constraint -> unit
val ppl_Z_Box_refine_with_congruence : z_box -> linear_congruence -> unit
val ppl_Z_Box_refine_with_constraints : z_box -> constraint_system -> unit
val ppl_Z_Box_refine_with_congruences : z_box -> congruence_system -> unit
val ppl_Z_Box_intersection_assign : z_box -> z_box -> unit
val ppl_Z_Box_upper_bound_assign : z_box -> z_box -> unit
val ppl_Z_Box_difference_assign : z_box -> z_box -> unit
val ppl_Z_Box_concatenate_assign : z_box -> z_box -> unit
val ppl_Z_Box_time_elapse_assign : z_box -> z_box -> unit
val ppl_Z_Box_upper_bound_assign_if_exact : z_box -> z_box -> bool
val ppl_Z_Box_simplify_using_context_assign : z_box -> z_box -> bool
val ppl_Z_Box_constrains : z_box -> int -> bool
val ppl_Z_Box_unconstrain_space_dimension : z_box -> int -> unit
val ppl_Z_Box_unconstrain_space_dimensions : z_box -> int list -> unit
val ppl_Z_Box_affine_image :
  z_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_affine_preimage :
  z_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_bounded_affine_image :
  z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_bounded_affine_preimage :
  z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_generalized_affine_image :
  z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_generalized_affine_preimage :
  z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Z_Box_generalized_affine_image_lhs_rhs :
  z_box ->
```

```
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Z_Box_generalized_affine_preimage_lhs_rhs :
  z_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Z_Box_add_space_dimensions_and_embed : z_box -> int -> unit
val ppl_Z_Box_add_space_dimensions_and_project : z_box -> int -> unit
val ppl_Z_Box_remove_space_dimensions : z_box -> int list -> unit
val ppl_Z_Box_remove_higher_space_dimensions : z_box -> int -> unit
val ppl_Z_Box_expand_space_dimension : z_box -> int -> int -> unit
val ppl_Z_Box_fold_space_dimensions : z_box -> int list -> int -> unit
val ppl_Z_Box_map_space_dimensions : z_box -> (int * int) list -> unit
val ppl_Z_Box_drop_some_non_integer_points :
  z_box -> complexity_class -> unit
val ppl_Z_Box_drop_some_non_integer_points_2 :
  z_box -> int list -> complexity_class -> unit
val ppl_Z_Box_ascii_dump : z_box -> string
val ppl_Z_Box_external_memory_in_bytes : z_box -> int
val ppl_Z_Box_total_memory_in_bytes : z_box -> int
val ppl_Z_Box_CC76_widening_assign_with_tokens : z_box -> z_box -> int -> int
val ppl_Z_Box_CC76_widening_assign : z_box -> z_box -> unit
val ppl_Z_Box_widening_assign_with_tokens : z_box -> z_box -> int -> int
val ppl_Z_Box_widening_assign : z_box -> z_box -> unit
val ppl_Z_Box_limited_CC76_extrapolation_assign_with_tokens :
  z_box ->
  z_box -> constraint_system -> int -> int
val ppl_Z_Box_limited_CC76_extrapolation_assign :
  z_box -> z_box -> constraint_system -> unit
val ppl_Z_Box_linear_partition :
  z_box ->
  z_box ->
  z_box * pointset_powerset_nnc_polyhedron
val ppl_Z_Box_wrap_assign :
  z_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Z_Box : z_box -> bool
val ppl_termination_test_PR_Z_Box : z_box -> bool
val ppl_one_affine_ranking_function_MS_Z_Box :
  z_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Z_Box :
  z_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Z_Box : z_box -> polyhedron
```

```
val ppl_all_affine_ranking_functions_PR_Z_Box : z_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Z_Box :
  z_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Z_Box_2 : z_box -> z_box -> bool
val ppl_termination_test_PR_Z_Box_2 : z_box -> z_box -> bool
val ppl_one_affine_ranking_function_MS_Z_Box_2 :
  z_box -> z_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Z_Box_2 :
  z_box -> z_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Z_Box_2 :
  z_box -> z_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Z_Box_2 :
  z_box -> z_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Z_Box_2 :
  z_box ->
  z_box -> polyhedron * polyhedron
val ppl_new_Rational_Box_from_space_dimension :
  int -> degenerate_element -> rational_box
val ppl_new_Rational_Box_from_Int8_Box : int8_box -> rational_box
val ppl_new_Rational_Box_from_Int16_Box : int16_box -> rational_box
val ppl_new_Rational_Box_from_Int32_Box : int32_box -> rational_box
val ppl_new_Rational_Box_from_Int64_Box : int64_box -> rational_box
val ppl_new_Rational_Box_from_Uint8_Box : uint8_box -> rational_box
val ppl_new_Rational_Box_from_Uint16_Box : uint16_box -> rational_box
val ppl_new_Rational_Box_from_Uint32_Box : uint32_box -> rational_box
val ppl_new_Rational_Box_from_Uint64_Box : uint64_box -> rational_box
val ppl_new_Rational_Box_from_Z_Box : z_box -> rational_box
val ppl_new_Rational_Box_from_Rational_Box : rational_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int8_t :
  bd_shape_int8_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int16_t :
  bd_shape_int16_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int32_t :
  bd_shape_int32_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int64_t :
  bd_shape_int64_t -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int64_t :
```

```
  octagonal_shape_int64_t -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> rational_box
val ppl_new_Rational_Box_from_C_Polyhedron : polyhedron -> rational_box
val ppl_new_Rational_Box_from_NNC_Polyhedron : polyhedron -> rational_box
val ppl_new_Rational_Box_from_Grid : grid -> rational_box
val ppl_new_Rational_Box_from_Float_Box : float_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_float : bd_shape_float -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> rational_box
val ppl_new_Rational_Box_from_Double_Box : double_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_double :
  bd_shape_double -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> rational_box
val ppl_new_Rational_Box_from_Long_Double_Box :
  long_double_box -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> rational_box
val ppl_new_Rational_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int16_t_with_complexity :
```

```
  bd_shape_int16_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Grid_with_complexity :
  grid -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
```

```
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> rational_box
val ppl_new_Rational_Box_from_constraints : constraint_system -> rational_box
val ppl_new_Rational_Box_from_congruences : congruence_system -> rational_box
val ppl_new_Rational_Box_from_generators : generator_system -> rational_box
val ppl_Rational_Box_swap : rational_box -> rational_box -> unit
val ppl_Rational_Box_space_dimension : rational_box -> int
val ppl_Rational_Box_affine_dimension : rational_box -> int
val ppl_Rational_Box_relation_with_constraint :
  rational_box ->
  linear_constraint -> poly_con_relation list
val ppl_Rational_Box_relation_with_generator :
  rational_box ->
  linear_generator -> poly_gen_relation list
val ppl_Rational_Box_relation_with_congruence :
  rational_box ->
  linear_congruence -> poly_con_relation list
val ppl_Rational_Box_get_constraints : rational_box -> constraint_system
val ppl_Rational_Box_get_congruences : rational_box -> congruence_system
val ppl_Rational_Box_get_minimized_constraints :
  rational_box -> constraint_system
val ppl_Rational_Box_get_minimized_congruences :
  rational_box -> congruence_system
val ppl_Rational_Box_is_empty : rational_box -> bool
val ppl_Rational_Box_is_universe : rational_box -> bool
val ppl_Rational_Box_is_bounded : rational_box -> bool
val ppl_Rational_Box_contains_integer_point : rational_box -> bool
val ppl_Rational_Box_is_topologically_closed : rational_box -> bool
val ppl_Rational_Box_is_discrete : rational_box -> bool
val ppl_Rational_Box_topological_closure_assign : rational_box -> unit
val ppl_Rational_Box_bounds_from_above :
  rational_box -> linear_expression -> bool
val ppl_Rational_Box_bounds_from_below :
  rational_box -> linear_expression -> bool
val ppl_Rational_Box_maximize :
  rational_box ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Rational_Box_minimize :
  rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Rational_Box_maximize_with_point :
  rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Rational_Box_minimize_with_point :
  rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Rational_Box_frequency :
  rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Rational_Box_contains_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_strictly_contains_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_is_disjoint_from_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_equals_Rational_Box :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_OK : rational_box -> bool
val ppl_Rational_Box_add_constraint :
  rational_box -> linear_constraint -> unit
val ppl_Rational_Box_add_congruence :
  rational_box -> linear_congruence -> unit
val ppl_Rational_Box_add_constraints :
  rational_box -> constraint_system -> unit
val ppl_Rational_Box_add_congruences :
  rational_box -> congruence_system -> unit
val ppl_Rational_Box_refine_with_constraint :
  rational_box -> linear_constraint -> unit
val ppl_Rational_Box_refine_with_congruence :
  rational_box -> linear_congruence -> unit
val ppl_Rational_Box_refine_with_constraints :
  rational_box -> constraint_system -> unit
val ppl_Rational_Box_refine_with_congruences :
  rational_box -> congruence_system -> unit
val ppl_Rational_Box_intersection_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_upper_bound_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_difference_assign : rational_box -> rational_box -> unit
val ppl_Rational_Box_concatenate_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_time_elapse_assign :
  rational_box -> rational_box -> unit
```

```
val ppl_Rational_Box_upper_bound_assign_if_exact :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_simplify_using_context_assign :
  rational_box -> rational_box -> bool
val ppl_Rational_Box_constrains : rational_box -> int -> bool
val ppl_Rational_Box_unconstrain_space_dimension :
  rational_box -> int -> unit
val ppl_Rational_Box_unconstrain_space_dimensions :
  rational_box -> int list -> unit
val ppl_Rational_Box_affine_image :
  rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_affine_preimage :
  rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_bounded_affine_image :
  rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_bounded_affine_preimage :
  rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_generalized_affine_image :
  rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_generalized_affine_preimage :
  rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Rational_Box_generalized_affine_image_lhs_rhs :
  rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Rational_Box_generalized_affine_preimage_lhs_rhs :
  rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Rational_Box_add_space_dimensions_and_embed :
  rational_box -> int -> unit
val ppl_Rational_Box_add_space_dimensions_and_project :
  rational_box -> int -> unit
val ppl_Rational_Box_remove_space_dimensions :
  rational_box -> int list -> unit
val ppl_Rational_Box_remove_higher_space_dimensions :
  rational_box -> int -> unit
val ppl_Rational_Box_expand_space_dimension :
  rational_box -> int -> int -> unit
val ppl_Rational_Box_fold_space_dimensions :
```

```
  rational_box -> int list -> int -> unit
val ppl_Rational_Box_map_space_dimensions :
  rational_box -> (int * int) list -> unit
val ppl_Rational_Box_drop_some_non_integer_points :
  rational_box -> complexity_class -> unit
val ppl_Rational_Box_drop_some_non_integer_points_2 :
  rational_box -> int list -> complexity_class -> unit
val ppl_Rational_Box_ascii_dump : rational_box -> string
val ppl_Rational_Box_external_memory_in_bytes : rational_box -> int
val ppl_Rational_Box_total_memory_in_bytes : rational_box -> int
val ppl_Rational_Box_CC76_widening_assign_with_tokens :
  rational_box -> rational_box -> int -> int
val ppl_Rational_Box_CC76_widening_assign :
  rational_box -> rational_box -> unit
val ppl_Rational_Box_widening_assign_with_tokens :
  rational_box -> rational_box -> int -> int
val ppl_Rational_Box_widening_assign : rational_box -> rational_box -> unit
val ppl_Rational_Box_limited_CC76_extrapolation_assign_with_tokens :
  rational_box ->
  rational_box -> constraint_system -> int -> int
val ppl_Rational_Box_limited_CC76_extrapolation_assign :
  rational_box ->
  rational_box -> constraint_system -> unit
val ppl_Rational_Box_linear_partition :
  rational_box ->
  rational_box ->
  rational_box * pointset_powerset_nnc_polyhedron
val ppl_Rational_Box_wrap_assign :
  rational_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Rational_Box : rational_box -> bool
val ppl_termination_test_PR_Rational_Box : rational_box -> bool
val ppl_one_affine_ranking_function_MS_Rational_Box :
  rational_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Rational_Box :
  rational_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Rational_Box :
  rational_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Rational_Box :
  rational_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Rational_Box :
  rational_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Rational_Box_2 :
  rational_box -> rational_box -> bool
```

```
val ppl_termination_test_PR_Rational_Box_2 :
  rational_box -> rational_box -> bool
val ppl_one_affine_ranking_function_MS_Rational_Box_2 :
  rational_box ->
  rational_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Rational_Box_2 :
  rational_box ->
  rational_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Rational_Box_2 :
  rational_box -> rational_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Rational_Box_2 :
  rational_box -> rational_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Rational_Box_2 :
  rational_box ->
  rational_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_int8_t_from_space_dimension :
  int -> degenerate_element -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int8_Box : int8_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int16_Box : int16_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int32_Box : int32_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int64_Box : int64_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint8_Box : uint8_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint16_Box : uint16_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint32_Box : uint32_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint64_Box : uint64_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Z_Box : z_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Rational_Box :
  rational_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int8_t
```

```
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_C_Polyhedron : polyhedron -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Grid : grid -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Float_Box : float_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_float :
  bd_shape_float -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Double_Box : double_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int8_t
```

```
val ppl_new_BD_Shape_int8_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int8_t
```

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val ppl_new_BD_Shape_int8_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_constraints :
  constraint_system -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_congruences :
  congruence_system -> bd_shape_int8_t
val ppl_new_BD_Shape_int8_t_from_generators :
  generator_system -> bd_shape_int8_t
val ppl_BD_Shape_int8_t_swap : bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_space_dimension : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_affine_dimension : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_relation_with_constraint :
  bd_shape_int8_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int8_t_relation_with_generator :
  bd_shape_int8_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int8_t_relation_with_congruence :
  bd_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int8_t_get_constraints :
  bd_shape_int8_t -> constraint_system
val ppl_BD_Shape_int8_t_get_congruences :
  bd_shape_int8_t -> congruence_system
val ppl_BD_Shape_int8_t_get_minimized_constraints :
  bd_shape_int8_t -> constraint_system
val ppl_BD_Shape_int8_t_get_minimized_congruences :
```

```
  bd_shape_int8_t -> congruence_system
val ppl_BD_Shape_int8_t_is_empty : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_universe : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_bounded : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_contains_integer_point : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_topologically_closed : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_discrete : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_topological_closure_assign : bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_bounds_from_above :
  bd_shape_int8_t -> linear_expression -> bool
val ppl_BD_Shape_int8_t_bounds_from_below :
  bd_shape_int8_t -> linear_expression -> bool
val ppl_BD_Shape_int8_t_maximize :
  bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int8_t_minimize :
  bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int8_t_maximize_with_point :
  bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int8_t_minimize_with_point :
  bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int8_t_frequency :
  bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int8_t_contains_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_strictly_contains_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_is_disjoint_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_equals_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_OK : bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_add_constraint :
  bd_shape_int8_t -> linear_constraint -> unit
val ppl_BD_Shape_int8_t_add_congruence :
  bd_shape_int8_t -> linear_congruence -> unit
val ppl_BD_Shape_int8_t_add_constraints :
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_add_congruences :
  bd_shape_int8_t -> congruence_system -> unit
val ppl_BD_Shape_int8_t_refine_with_constraint :
  bd_shape_int8_t -> linear_constraint -> unit
```

```
val ppl_BD_Shape_int8_t_refine_with_congruence :
  bd_shape_int8_t -> linear_congruence -> unit
val ppl_BD_Shape_int8_t_refine_with_constraints :
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_refine_with_congruences :
  bd_shape_int8_t -> congruence_system -> unit
val ppl_BD_Shape_int8_t_intersection_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_upper_bound_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_difference_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_concatenate_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_time_elapse_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_upper_bound_assign_if_exact :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_simplify_using_context_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_BD_Shape_int8_t_constrains : bd_shape_int8_t -> int -> bool
val ppl_BD_Shape_int8_t_unconstrain_space_dimension :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_unconstrain_space_dimensions :
  bd_shape_int8_t -> int list -> unit
val ppl_BD_Shape_int8_t_affine_image :
  bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_affine_preimage :
  bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_bounded_affine_image :
  bd_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_bounded_affine_preimage :
  bd_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_generalized_affine_image :
  bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_generalized_affine_preimage :
  bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int8_t_generalized_affine_image_lhs_rhs :
  bd_shape_int8_t ->
```

```
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int8_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int8_t_add_space_dimensions_and_embed :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_add_space_dimensions_and_project :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_remove_space_dimensions :
  bd_shape_int8_t -> int list -> unit
val ppl_BD_Shape_int8_t_remove_higher_space_dimensions :
  bd_shape_int8_t -> int -> unit
val ppl_BD_Shape_int8_t_expand_space_dimension :
  bd_shape_int8_t -> int -> int -> unit
val ppl_BD_Shape_int8_t_fold_space_dimensions :
  bd_shape_int8_t -> int list -> int -> unit
val ppl_BD_Shape_int8_t_map_space_dimensions :
  bd_shape_int8_t -> (int * int) list -> unit
val ppl_BD_Shape_int8_t_drop_some_non_integer_points :
  bd_shape_int8_t -> complexity_class -> unit
val ppl_BD_Shape_int8_t_drop_some_non_integer_points_2 :
  bd_shape_int8_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int8_t_ascii_dump : bd_shape_int8_t -> string
val ppl_BD_Shape_int8_t_external_memory_in_bytes : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_total_memory_in_bytes : bd_shape_int8_t -> int
val ppl_BD_Shape_int8_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_H79_widening_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_BHMZ05_widening_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_H79_widening_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_widening_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_widening_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> int -> int
val ppl_BD_Shape_int8_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> int -> int
val ppl_BD_Shape_int8_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> int -> int
```

```
val ppl_BD_Shape_int8_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_limited_H79_extrapolation_assign :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_limited_CC76_extrapolation_assign :
  bd_shape_int8_t ->
  bd_shape_int8_t -> constraint_system -> unit
val ppl_BD_Shape_int8_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int8_t -> bd_shape_int8_t -> int -> int
val ppl_BD_Shape_int8_t_CC76_extrapolation_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_CC76_narrowing_assign :
  bd_shape_int8_t -> bd_shape_int8_t -> unit
val ppl_BD_Shape_int8_t_linear_partition :
  bd_shape_int8_t ->
  bd_shape_int8_t ->
  bd_shape_int8_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int8_t_wrap_assign :
  bd_shape_int8_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int8_t : bd_shape_int8_t -> bool
val ppl_termination_test_PR_BD_Shape_int8_t : bd_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int8_t :
  bd_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int8_t :
  bd_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int8_t_2 :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_termination_test_PR_BD_Shape_int8_t_2 :
  bd_shape_int8_t -> bd_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int8_t_2 :
```

```
  bd_shape_int8_t ->
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int8_t_2 :
  bd_shape_int8_t ->
  bd_shape_int8_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_int16_t_from_space_dimension :
  int -> degenerate_element -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int8_Box : int8_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int16_Box : int16_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int32_Box : int32_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int64_Box : int64_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint8_Box : uint8_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint16_Box : uint16_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint32_Box : uint32_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint64_Box : uint64_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Z_Box : z_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Rational_Box :
  rational_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_C_Polyhedron :
  polyhedron -> bd_shape_int16_t
```

```
val ppl_new_BD_Shape_int16_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Grid : grid -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Float_Box : float_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_float :
  bd_shape_float -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Double_Box : double_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int8_t_with_complexity :
```

```
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_float_with_complexity :
```

```
  octagonal_shape_float ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_constraints :
  constraint_system -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_congruences :
  congruence_system -> bd_shape_int16_t
val ppl_new_BD_Shape_int16_t_from_generators :
  generator_system -> bd_shape_int16_t
val ppl_BD_Shape_int16_t_swap : bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_space_dimension : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_affine_dimension : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_relation_with_constraint :
  bd_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int16_t_relation_with_generator :
  bd_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int16_t_relation_with_congruence :
  bd_shape_int16_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int16_t_get_constraints :
  bd_shape_int16_t -> constraint_system
val ppl_BD_Shape_int16_t_get_congruences :
  bd_shape_int16_t -> congruence_system
val ppl_BD_Shape_int16_t_get_minimized_constraints :
  bd_shape_int16_t -> constraint_system
val ppl_BD_Shape_int16_t_get_minimized_congruences :
  bd_shape_int16_t -> congruence_system
val ppl_BD_Shape_int16_t_is_empty : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_universe : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_bounded : bd_shape_int16_t -> bool
```

```
val ppl_BD_Shape_int16_t_contains_integer_point : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_topologically_closed : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_discrete : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_topological_closure_assign :
  bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_bounds_from_above :
  bd_shape_int16_t -> linear_expression -> bool
val ppl_BD_Shape_int16_t_bounds_from_below :
  bd_shape_int16_t -> linear_expression -> bool
val ppl_BD_Shape_int16_t_maximize :
  bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int16_t_minimize :
  bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int16_t_maximize_with_point :
  bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int16_t_minimize_with_point :
  bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int16_t_frequency :
  bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int16_t_contains_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_strictly_contains_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_is_disjoint_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_equals_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_OK : bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_add_constraint :
  bd_shape_int16_t -> linear_constraint -> unit
val ppl_BD_Shape_int16_t_add_congruence :
  bd_shape_int16_t -> linear_congruence -> unit
val ppl_BD_Shape_int16_t_add_constraints :
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_add_congruences :
  bd_shape_int16_t -> congruence_system -> unit
val ppl_BD_Shape_int16_t_refine_with_constraint :
  bd_shape_int16_t -> linear_constraint -> unit
val ppl_BD_Shape_int16_t_refine_with_congruence :
  bd_shape_int16_t -> linear_congruence -> unit
val ppl_BD_Shape_int16_t_refine_with_constraints :
  bd_shape_int16_t -> constraint_system -> unit
```

```
val ppl_BD_Shape_int16_t_refine_with_congruences :
  bd_shape_int16_t -> congruence_system -> unit
val ppl_BD_Shape_int16_t_intersection_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_upper_bound_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_difference_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_concatenate_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_time_elapse_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_upper_bound_assign_if_exact :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_simplify_using_context_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_BD_Shape_int16_t_constrains : bd_shape_int16_t -> int -> bool
val ppl_BD_Shape_int16_t_unconstrain_space_dimension :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_unconstrain_space_dimensions :
  bd_shape_int16_t -> int list -> unit
val ppl_BD_Shape_int16_t_affine_image :
  bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_affine_preimage :
  bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_bounded_affine_image :
  bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_bounded_affine_preimage :
  bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_generalized_affine_image :
  bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_generalized_affine_preimage :
  bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int16_t_generalized_affine_image_lhs_rhs :
  bd_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int16_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int16_t ->
  linear_expression ->
```

```
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int16_t_add_space_dimensions_and_embed :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_add_space_dimensions_and_project :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_remove_space_dimensions :
  bd_shape_int16_t -> int list -> unit
val ppl_BD_Shape_int16_t_remove_higher_space_dimensions :
  bd_shape_int16_t -> int -> unit
val ppl_BD_Shape_int16_t_expand_space_dimension :
  bd_shape_int16_t -> int -> int -> unit
val ppl_BD_Shape_int16_t_fold_space_dimensions :
  bd_shape_int16_t -> int list -> int -> unit
val ppl_BD_Shape_int16_t_map_space_dimensions :
  bd_shape_int16_t -> (int * int) list -> unit
val ppl_BD_Shape_int16_t_drop_some_non_integer_points :
  bd_shape_int16_t -> complexity_class -> unit
val ppl_BD_Shape_int16_t_drop_some_non_integer_points_2 :
  bd_shape_int16_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int16_t_ascii_dump : bd_shape_int16_t -> string
val ppl_BD_Shape_int16_t_external_memory_in_bytes : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_total_memory_in_bytes : bd_shape_int16_t -> int
val ppl_BD_Shape_int16_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_H79_widening_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_BHMZ05_widening_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_H79_widening_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_widening_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_widening_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> int -> int
val ppl_BD_Shape_int16_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> int -> int
val ppl_BD_Shape_int16_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> int -> int
val ppl_BD_Shape_int16_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_limited_H79_extrapolation_assign :
  bd_shape_int16_t ->
```

```
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_limited_CC76_extrapolation_assign :
  bd_shape_int16_t ->
  bd_shape_int16_t -> constraint_system -> unit
val ppl_BD_Shape_int16_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int16_t -> bd_shape_int16_t -> int -> int
val ppl_BD_Shape_int16_t_CC76_extrapolation_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_CC76_narrowing_assign :
  bd_shape_int16_t -> bd_shape_int16_t -> unit
val ppl_BD_Shape_int16_t_linear_partition :
  bd_shape_int16_t ->
  bd_shape_int16_t ->
  bd_shape_int16_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int16_t_wrap_assign :
  bd_shape_int16_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int16_t : bd_shape_int16_t -> bool
val ppl_termination_test_PR_BD_Shape_int16_t : bd_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int16_t :
  bd_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int16_t :
  bd_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_termination_test_PR_BD_Shape_int16_t_2 :
  bd_shape_int16_t -> bd_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> polyhedron
```

```
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int16_t_2 :
  bd_shape_int16_t ->
  bd_shape_int16_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_int32_t_from_space_dimension :
  int -> degenerate_element -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int8_Box : int8_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int16_Box : int16_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int32_Box : int32_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int64_Box : int64_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint8_Box : uint8_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint16_Box : uint16_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint32_Box : uint32_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint64_Box : uint64_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Z_Box : z_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Rational_Box :
  rational_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_C_Polyhedron :
  polyhedron -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Grid : grid -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Float_Box : float_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_float :
```

```
  bd_shape_float -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Double_Box : double_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int32_t
```

```
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int32_t
```

```
val ppl_new_BD_Shape_int32_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_constraints :
  constraint_system -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_congruences :
  congruence_system -> bd_shape_int32_t
val ppl_new_BD_Shape_int32_t_from_generators :
  generator_system -> bd_shape_int32_t
val ppl_BD_Shape_int32_t_swap : bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_space_dimension : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_affine_dimension : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_relation_with_constraint :
  bd_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int32_t_relation_with_generator :
  bd_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int32_t_relation_with_congruence :
  bd_shape_int32_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int32_t_get_constraints :
  bd_shape_int32_t -> constraint_system
val ppl_BD_Shape_int32_t_get_congruences :
  bd_shape_int32_t -> congruence_system
val ppl_BD_Shape_int32_t_get_minimized_constraints :
  bd_shape_int32_t -> constraint_system
val ppl_BD_Shape_int32_t_get_minimized_congruences :
  bd_shape_int32_t -> congruence_system
val ppl_BD_Shape_int32_t_is_empty : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_universe : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_bounded : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_contains_integer_point : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_topologically_closed : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_discrete : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_topological_closure_assign :
```

```
  bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_bounds_from_above :
  bd_shape_int32_t -> linear_expression -> bool
val ppl_BD_Shape_int32_t_bounds_from_below :
  bd_shape_int32_t -> linear_expression -> bool
val ppl_BD_Shape_int32_t_maximize :
  bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int32_t_minimize :
  bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int32_t_maximize_with_point :
  bd_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int32_t_minimize_with_point :
  bd_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int32_t_frequency :
  bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int32_t_contains_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_strictly_contains_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_is_disjoint_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_equals_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_OK : bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_add_constraint :
  bd_shape_int32_t -> linear_constraint -> unit
val ppl_BD_Shape_int32_t_add_congruence :
  bd_shape_int32_t -> linear_congruence -> unit
val ppl_BD_Shape_int32_t_add_constraints :
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_add_congruences :
  bd_shape_int32_t -> congruence_system -> unit
val ppl_BD_Shape_int32_t_refine_with_constraint :
  bd_shape_int32_t -> linear_constraint -> unit
val ppl_BD_Shape_int32_t_refine_with_congruence :
  bd_shape_int32_t -> linear_congruence -> unit
val ppl_BD_Shape_int32_t_refine_with_constraints :
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_refine_with_congruences :
  bd_shape_int32_t -> congruence_system -> unit
val ppl_BD_Shape_int32_t_intersection_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
```

```
val ppl_BD_Shape_int32_t_upper_bound_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_difference_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_concatenate_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_time_elapse_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_upper_bound_assign_if_exact :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_simplify_using_context_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_BD_Shape_int32_t_constrains : bd_shape_int32_t -> int -> bool
val ppl_BD_Shape_int32_t_unconstrain_space_dimension :
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_unconstrain_space_dimensions :
  bd_shape_int32_t -> int list -> unit
val ppl_BD_Shape_int32_t_affine_image :
  bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_affine_preimage :
  bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_bounded_affine_image :
  bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_bounded_affine_preimage :
  bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_generalized_affine_image :
  bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_generalized_affine_preimage :
  bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int32_t_generalized_affine_image_lhs_rhs :
  bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int32_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int32_t_add_space_dimensions_and_embed :
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_add_space_dimensions_and_project :
```

```
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_remove_space_dimensions :
  bd_shape_int32_t -> int list -> unit
val ppl_BD_Shape_int32_t_remove_higher_space_dimensions :
  bd_shape_int32_t -> int -> unit
val ppl_BD_Shape_int32_t_expand_space_dimension :
  bd_shape_int32_t -> int -> int -> unit
val ppl_BD_Shape_int32_t_fold_space_dimensions :
  bd_shape_int32_t -> int list -> int -> unit
val ppl_BD_Shape_int32_t_map_space_dimensions :
  bd_shape_int32_t -> (int * int) list -> unit
val ppl_BD_Shape_int32_t_drop_some_non_integer_points :
  bd_shape_int32_t -> complexity_class -> unit
val ppl_BD_Shape_int32_t_drop_some_non_integer_points_2 :
  bd_shape_int32_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int32_t_ascii_dump : bd_shape_int32_t -> string
val ppl_BD_Shape_int32_t_external_memory_in_bytes : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_total_memory_in_bytes : bd_shape_int32_t -> int
val ppl_BD_Shape_int32_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_H79_widening_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_BHMZ05_widening_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_H79_widening_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_widening_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_widening_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> int -> int
val ppl_BD_Shape_int32_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> int -> int
val ppl_BD_Shape_int32_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> int -> int
val ppl_BD_Shape_int32_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_limited_H79_extrapolation_assign :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> unit
val ppl_BD_Shape_int32_t_limited_CC76_extrapolation_assign :
  bd_shape_int32_t ->
  bd_shape_int32_t -> constraint_system -> unit
```

```
val ppl_BD_Shape_int32_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int32_t -> bd_shape_int32_t -> int -> int
val ppl_BD_Shape_int32_t_CC76_extrapolation_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_CC76_narrowing_assign :
  bd_shape_int32_t -> bd_shape_int32_t -> unit
val ppl_BD_Shape_int32_t_linear_partition :
  bd_shape_int32_t ->
  bd_shape_int32_t ->
  bd_shape_int32_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int32_t_wrap_assign :
  bd_shape_int32_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int32_t : bd_shape_int32_t -> bool
val ppl_termination_test_PR_BD_Shape_int32_t : bd_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int32_t :
  bd_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int32_t :
  bd_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_termination_test_PR_BD_Shape_int32_t_2 :
  bd_shape_int32_t -> bd_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int32_t_2 :
  bd_shape_int32_t ->
  bd_shape_int32_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_int64_t_from_space_dimension :
```

```
  int -> degenerate_element -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int8_Box : int8_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int16_Box : int16_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int32_Box : int32_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int64_Box : int64_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint8_Box : uint8_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint16_Box : uint16_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint32_Box : uint32_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint64_Box : uint64_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Z_Box : z_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Rational_Box :
  rational_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_C_Polyhedron :
  polyhedron -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_NNC_Polyhedron :
  polyhedron -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Grid : grid -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Float_Box : float_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_float :
  bd_shape_float -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Double_Box : double_box -> bd_shape_int64_t
```

```
val ppl_new_BD_Shape_int64_t_from_BD_Shape_double :
  bd_shape_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Long_Double_Box :
  long_double_box -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
```

```
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
```

```
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_constraints :
  constraint_system -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_congruences :
  congruence_system -> bd_shape_int64_t
val ppl_new_BD_Shape_int64_t_from_generators :
  generator_system -> bd_shape_int64_t
val ppl_BD_Shape_int64_t_swap : bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_space_dimension : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_affine_dimension : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_relation_with_constraint :
  bd_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_int64_t_relation_with_generator :
  bd_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_int64_t_relation_with_congruence :
  bd_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_int64_t_get_constraints :
  bd_shape_int64_t -> constraint_system
val ppl_BD_Shape_int64_t_get_congruences :
  bd_shape_int64_t -> congruence_system
val ppl_BD_Shape_int64_t_get_minimized_constraints :
  bd_shape_int64_t -> constraint_system
val ppl_BD_Shape_int64_t_get_minimized_congruences :
  bd_shape_int64_t -> congruence_system
val ppl_BD_Shape_int64_t_is_empty : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_universe : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_bounded : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_contains_integer_point : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_topologically_closed : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_discrete : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_topological_closure_assign :
  bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_bounds_from_above :
  bd_shape_int64_t -> linear_expression -> bool
val ppl_BD_Shape_int64_t_bounds_from_below :
  bd_shape_int64_t -> linear_expression -> bool
```

```
val ppl_BD_Shape_int64_t_maximize :
  bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int64_t_minimize :
  bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_int64_t_maximize_with_point :
  bd_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int64_t_minimize_with_point :
  bd_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_int64_t_frequency :
  bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_int64_t_contains_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_strictly_contains_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_is_disjoint_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_equals_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_OK : bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_add_constraint :
  bd_shape_int64_t -> linear_constraint -> unit
val ppl_BD_Shape_int64_t_add_congruence :
  bd_shape_int64_t -> linear_congruence -> unit
val ppl_BD_Shape_int64_t_add_constraints :
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_add_congruences :
  bd_shape_int64_t -> congruence_system -> unit
val ppl_BD_Shape_int64_t_refine_with_constraint :
  bd_shape_int64_t -> linear_constraint -> unit
val ppl_BD_Shape_int64_t_refine_with_congruence :
  bd_shape_int64_t -> linear_congruence -> unit
val ppl_BD_Shape_int64_t_refine_with_constraints :
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_refine_with_congruences :
  bd_shape_int64_t -> congruence_system -> unit
val ppl_BD_Shape_int64_t_intersection_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_upper_bound_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_difference_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_concatenate_assign :
```

```
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_time_elapse_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_upper_bound_assign_if_exact :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_simplify_using_context_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_BD_Shape_int64_t_constrains : bd_shape_int64_t -> int -> bool
val ppl_BD_Shape_int64_t_unconstrain_space_dimension :
  bd_shape_int64_t -> int -> unit
val ppl_BD_Shape_int64_t_unconstrain_space_dimensions :
  bd_shape_int64_t -> int list -> unit
val ppl_BD_Shape_int64_t_affine_image :
  bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_affine_preimage :
  bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_bounded_affine_image :
  bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_bounded_affine_preimage :
  bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_generalized_affine_image :
  bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_generalized_affine_preimage :
  bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_int64_t_generalized_affine_image_lhs_rhs :
  bd_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int64_t_generalized_affine_preimage_lhs_rhs :
  bd_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_int64_t_add_space_dimensions_and_embed :
  bd_shape_int64_t -> int -> unit
val ppl_BD_Shape_int64_t_add_space_dimensions_and_project :
  bd_shape_int64_t -> int -> unit
val ppl_BD_Shape_int64_t_remove_space_dimensions :
  bd_shape_int64_t -> int list -> unit
val ppl_BD_Shape_int64_t_remove_higher_space_dimensions :
  bd_shape_int64_t -> int -> unit
```

```
val ppl_BD_Shape_int64_t_expand_space_dimension :
  bd_shape_int64_t -> int -> int -> unit
val ppl_BD_Shape_int64_t_fold_space_dimensions :
  bd_shape_int64_t -> int list -> int -> unit
val ppl_BD_Shape_int64_t_map_space_dimensions :
  bd_shape_int64_t -> (int * int) list -> unit
val ppl_BD_Shape_int64_t_drop_some_non_integer_points :
  bd_shape_int64_t -> complexity_class -> unit
val ppl_BD_Shape_int64_t_drop_some_non_integer_points_2 :
  bd_shape_int64_t -> int list -> complexity_class -> unit
val ppl_BD_Shape_int64_t_ascii_dump : bd_shape_int64_t -> string
val ppl_BD_Shape_int64_t_external_memory_in_bytes : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_total_memory_in_bytes : bd_shape_int64_t -> int
val ppl_BD_Shape_int64_t_BHMZ05_widening_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_H79_widening_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_BHMZ05_widening_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_H79_widening_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_widening_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_widening_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> int -> int
val ppl_BD_Shape_int64_t_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> int -> int
val ppl_BD_Shape_int64_t_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> int -> int
val ppl_BD_Shape_int64_t_limited_BHMZ05_extrapolation_assign :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_limited_H79_extrapolation_assign :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_limited_CC76_extrapolation_assign :
  bd_shape_int64_t ->
  bd_shape_int64_t -> constraint_system -> unit
val ppl_BD_Shape_int64_t_CC76_extrapolation_assign_with_tokens :
  bd_shape_int64_t -> bd_shape_int64_t -> int -> int
val ppl_BD_Shape_int64_t_CC76_extrapolation_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
val ppl_BD_Shape_int64_t_CC76_narrowing_assign :
  bd_shape_int64_t -> bd_shape_int64_t -> unit
```

```
val ppl_BD_Shape_int64_t_linear_partition :
  bd_shape_int64_t ->
  bd_shape_int64_t ->
  bd_shape_int64_t * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_int64_t_wrap_assign :
  bd_shape_int64_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_int64_t : bd_shape_int64_t -> bool
val ppl_termination_test_PR_BD_Shape_int64_t : bd_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int64_t :
  bd_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int64_t :
  bd_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_termination_test_PR_BD_Shape_int64_t_2 :
  bd_shape_int64_t -> bd_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_int64_t_2 :
  bd_shape_int64_t ->
  bd_shape_int64_t -> polyhedron * polyhedron
val ppl_new_BD_Shape_mpz_class_from_space_dimension :
  int -> degenerate_element -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int8_Box : int8_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int16_Box :
  int16_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int32_Box :
  int32_box -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_Int64_Box :
  int64_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint8_Box :
  uint8_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint16_Box :
  uint16_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint32_Box :
  uint32_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint64_Box :
  uint64_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Z_Box : z_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Rational_Box :
  rational_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_C_Polyhedron :
  polyhedron -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_NNC_Polyhedron :
  polyhedron -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Grid : grid -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Float_Box :
  float_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_float :
  bd_shape_float -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_Double_Box :
  double_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_double :
  bd_shape_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Long_Double_Box :
  long_double_box -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_mpz_class
```

```
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_constraints :
  constraint_system -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_congruences :
  congruence_system -> bd_shape_mpz_class
val ppl_new_BD_Shape_mpz_class_from_generators :
  generator_system -> bd_shape_mpz_class
val ppl_BD_Shape_mpz_class_swap :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_space_dimension : bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_affine_dimension : bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_relation_with_constraint :
  bd_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_mpz_class_relation_with_generator :
  bd_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_mpz_class_relation_with_congruence :
  bd_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_mpz_class_get_constraints :
  bd_shape_mpz_class -> constraint_system
val ppl_BD_Shape_mpz_class_get_congruences :
  bd_shape_mpz_class -> congruence_system
val ppl_BD_Shape_mpz_class_get_minimized_constraints :
  bd_shape_mpz_class -> constraint_system
val ppl_BD_Shape_mpz_class_get_minimized_congruences :
  bd_shape_mpz_class -> congruence_system
val ppl_BD_Shape_mpz_class_is_empty : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_universe : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_bounded : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_contains_integer_point :
  bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_topologically_closed :
  bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_discrete : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_topological_closure_assign :
```

```
  bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_bounds_from_above :
  bd_shape_mpz_class -> linear_expression -> bool
val ppl_BD_Shape_mpz_class_bounds_from_below :
  bd_shape_mpz_class -> linear_expression -> bool
val ppl_BD_Shape_mpz_class_maximize :
  bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpz_class_minimize :
  bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpz_class_maximize_with_point :
  bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpz_class_minimize_with_point :
  bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpz_class_frequency :
  bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_mpz_class_contains_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_strictly_contains_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_is_disjoint_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_equals_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_OK : bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_add_constraint :
  bd_shape_mpz_class -> linear_constraint -> unit
val ppl_BD_Shape_mpz_class_add_congruence :
  bd_shape_mpz_class -> linear_congruence -> unit
val ppl_BD_Shape_mpz_class_add_constraints :
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_add_congruences :
  bd_shape_mpz_class -> congruence_system -> unit
val ppl_BD_Shape_mpz_class_refine_with_constraint :
  bd_shape_mpz_class -> linear_constraint -> unit
val ppl_BD_Shape_mpz_class_refine_with_congruence :
  bd_shape_mpz_class -> linear_congruence -> unit
val ppl_BD_Shape_mpz_class_refine_with_constraints :
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_refine_with_congruences :
  bd_shape_mpz_class -> congruence_system -> unit
val ppl_BD_Shape_mpz_class_intersection_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
```

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val ppl_BD_Shape_mpz_class_upper_bound_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_difference_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_concatenate_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_time_elapse_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_upper_bound_assign_if_exact :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_simplify_using_context_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_BD_Shape_mpz_class_constrains : bd_shape_mpz_class -> int -> bool
val ppl_BD_Shape_mpz_class_unconstrain_space_dimension :
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_unconstrain_space_dimensions :
  bd_shape_mpz_class -> int list -> unit
val ppl_BD_Shape_mpz_class_affine_image :
  bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_affine_preimage :
  bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_bounded_affine_image :
  bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_bounded_affine_preimage :
  bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_image :
  bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_preimage :
  bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_image_lhs_rhs :
  bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpz_class_generalized_affine_preimage_lhs_rhs :
  bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpz_class_add_space_dimensions_and_embed :
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_add_space_dimensions_and_project :
```

```
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_remove_space_dimensions :
  bd_shape_mpz_class -> int list -> unit
val ppl_BD_Shape_mpz_class_remove_higher_space_dimensions :
  bd_shape_mpz_class -> int -> unit
val ppl_BD_Shape_mpz_class_expand_space_dimension :
  bd_shape_mpz_class -> int -> int -> unit
val ppl_BD_Shape_mpz_class_fold_space_dimensions :
  bd_shape_mpz_class -> int list -> int -> unit
val ppl_BD_Shape_mpz_class_map_space_dimensions :
  bd_shape_mpz_class -> (int * int) list -> unit
val ppl_BD_Shape_mpz_class_drop_some_non_integer_points :
  bd_shape_mpz_class -> complexity_class -> unit
val ppl_BD_Shape_mpz_class_drop_some_non_integer_points_2 :
  bd_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_BD_Shape_mpz_class_ascii_dump : bd_shape_mpz_class -> string
val ppl_BD_Shape_mpz_class_external_memory_in_bytes :
  bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_total_memory_in_bytes : bd_shape_mpz_class -> int
val ppl_BD_Shape_mpz_class_BHMZ05_widening_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_H79_widening_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_BHMZ05_widening_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_H79_widening_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_widening_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_widening_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpz_class_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpz_class_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpz_class_limited_BHMZ05_extrapolation_assign :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_limited_H79_extrapolation_assign :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_limited_CC76_extrapolation_assign :
  bd_shape_mpz_class ->
```

```
  bd_shape_mpz_class -> constraint_system -> unit
val ppl_BD_Shape_mpz_class_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpz_class -> bd_shape_mpz_class -> int -> int
val ppl_BD_Shape_mpz_class_CC76_extrapolation_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_CC76_narrowing_assign :
  bd_shape_mpz_class -> bd_shape_mpz_class -> unit
val ppl_BD_Shape_mpz_class_linear_partition :
  bd_shape_mpz_class ->
  bd_shape_mpz_class ->
  bd_shape_mpz_class * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_mpz_class_wrap_assign :
  bd_shape_mpz_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_mpz_class : bd_shape_mpz_class -> bool
val ppl_termination_test_PR_BD_Shape_mpz_class : bd_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_termination_test_PR_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class -> bd_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpz_class_2 :
  bd_shape_mpz_class ->
  bd_shape_mpz_class -> polyhedron * polyhedron
```

```
val ppl_new_BD_Shape_mpq_class_from_space_dimension :
  int -> degenerate_element -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int8_Box : int8_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int16_Box :
  int16_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int32_Box :
  int32_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int64_Box :
  int64_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint8_Box :
  uint8_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint16_Box :
  uint16_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint32_Box :
  uint32_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint64_Box :
  uint64_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Z_Box : z_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Rational_Box :
  rational_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_C_Polyhedron :
  polyhedron -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_NNC_Polyhedron :
  polyhedron -> bd_shape_mpq_class
```

```
val ppl_new_BD_Shape_mpq_class_from_Grid : grid -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Float_Box :
  float_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_float :
  bd_shape_float -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Double_Box :
  double_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_double :
  bd_shape_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Long_Double_Box :
  long_double_box -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int8_t_with_complexity :
```

```
  bd_shape_int8_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_float_with_complexity :
```

```
  octagonal_shape_float ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_constraints :
  constraint_system -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_congruences :
  congruence_system -> bd_shape_mpq_class
val ppl_new_BD_Shape_mpq_class_from_generators :
  generator_system -> bd_shape_mpq_class
val ppl_BD_Shape_mpq_class_swap :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_space_dimension : bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_affine_dimension : bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_relation_with_constraint :
  bd_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_mpq_class_relation_with_generator :
  bd_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_mpq_class_relation_with_congruence :
  bd_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_mpq_class_get_constraints :
  bd_shape_mpq_class -> constraint_system
val ppl_BD_Shape_mpq_class_get_congruences :
  bd_shape_mpq_class -> congruence_system
val ppl_BD_Shape_mpq_class_get_minimized_constraints :
  bd_shape_mpq_class -> constraint_system
val ppl_BD_Shape_mpq_class_get_minimized_congruences :
  bd_shape_mpq_class -> congruence_system
val ppl_BD_Shape_mpq_class_is_empty : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_universe : bd_shape_mpq_class -> bool
```

```
val ppl_BD_Shape_mpq_class_is_bounded : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_contains_integer_point :
  bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_topologically_closed :
  bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_discrete : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_topological_closure_assign :
  bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_bounds_from_above :
  bd_shape_mpq_class -> linear_expression -> bool
val ppl_BD_Shape_mpq_class_bounds_from_below :
  bd_shape_mpq_class -> linear_expression -> bool
val ppl_BD_Shape_mpq_class_maximize :
  bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpq_class_minimize :
  bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_mpq_class_maximize_with_point :
  bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpq_class_minimize_with_point :
  bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_mpq_class_frequency :
  bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_mpq_class_contains_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_strictly_contains_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_is_disjoint_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_equals_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_OK : bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_add_constraint :
  bd_shape_mpq_class -> linear_constraint -> unit
val ppl_BD_Shape_mpq_class_add_congruence :
  bd_shape_mpq_class -> linear_congruence -> unit
val ppl_BD_Shape_mpq_class_add_constraints :
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_add_congruences :
  bd_shape_mpq_class -> congruence_system -> unit
val ppl_BD_Shape_mpq_class_refine_with_constraint :
  bd_shape_mpq_class -> linear_constraint -> unit
val ppl_BD_Shape_mpq_class_refine_with_congruence :
```

```
  bd_shape_mpq_class -> linear_congruence -> unit
val ppl_BD_Shape_mpq_class_refine_with_constraints :
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_refine_with_congruences :
  bd_shape_mpq_class -> congruence_system -> unit
val ppl_BD_Shape_mpq_class_intersection_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_upper_bound_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_difference_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_concatenate_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_time_elapse_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_upper_bound_assign_if_exact :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_simplify_using_context_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_BD_Shape_mpq_class_constrains : bd_shape_mpq_class -> int -> bool
val ppl_BD_Shape_mpq_class_unconstrain_space_dimension :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_unconstrain_space_dimensions :
  bd_shape_mpq_class -> int list -> unit
val ppl_BD_Shape_mpq_class_affine_image :
  bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_affine_preimage :
  bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_bounded_affine_image :
  bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_bounded_affine_preimage :
  bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_image :
  bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_preimage :
  bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_image_lhs_rhs :
  bd_shape_mpq_class ->
  linear_expression ->
```

```
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpq_class_generalized_affine_preimage_lhs_rhs :
  bd_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_mpq_class_add_space_dimensions_and_embed :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_add_space_dimensions_and_project :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_remove_space_dimensions :
  bd_shape_mpq_class -> int list -> unit
val ppl_BD_Shape_mpq_class_remove_higher_space_dimensions :
  bd_shape_mpq_class -> int -> unit
val ppl_BD_Shape_mpq_class_expand_space_dimension :
  bd_shape_mpq_class -> int -> int -> unit
val ppl_BD_Shape_mpq_class_fold_space_dimensions :
  bd_shape_mpq_class -> int list -> int -> unit
val ppl_BD_Shape_mpq_class_map_space_dimensions :
  bd_shape_mpq_class -> (int * int) list -> unit
val ppl_BD_Shape_mpq_class_drop_some_non_integer_points :
  bd_shape_mpq_class -> complexity_class -> unit
val ppl_BD_Shape_mpq_class_drop_some_non_integer_points_2 :
  bd_shape_mpq_class ->
  int list -> complexity_class -> unit
val ppl_BD_Shape_mpq_class_ascii_dump : bd_shape_mpq_class -> string
val ppl_BD_Shape_mpq_class_external_memory_in_bytes :
  bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_total_memory_in_bytes : bd_shape_mpq_class -> int
val ppl_BD_Shape_mpq_class_BHMZ05_widening_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_H79_widening_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_BHMZ05_widening_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_H79_widening_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_widening_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_widening_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpq_class_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> int -> int
val ppl_BD_Shape_mpq_class_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> int -> int
```

```
val ppl_BD_Shape_mpq_class_limited_BHMZ05_extrapolation_assign :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_limited_H79_extrapolation_assign :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_limited_CC76_extrapolation_assign :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> constraint_system -> unit
val ppl_BD_Shape_mpq_class_CC76_extrapolation_assign_with_tokens :
  bd_shape_mpq_class -> bd_shape_mpq_class -> int -> int
val ppl_BD_Shape_mpq_class_CC76_extrapolation_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_CC76_narrowing_assign :
  bd_shape_mpq_class -> bd_shape_mpq_class -> unit
val ppl_BD_Shape_mpq_class_linear_partition :
  bd_shape_mpq_class ->
  bd_shape_mpq_class ->
  bd_shape_mpq_class * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_mpq_class_wrap_assign :
  bd_shape_mpq_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_mpq_class : bd_shape_mpq_class -> bool
val ppl_termination_test_PR_BD_Shape_mpq_class : bd_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_termination_test_PR_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class -> bd_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_mpq_class_2 :
```

```
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_mpq_class_2 :
  bd_shape_mpq_class ->
  bd_shape_mpq_class -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int8_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int8_Box :
  int8_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int16_Box :
  int16_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int32_Box :
  int32_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int64_Box :
  int64_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Z_Box :
  z_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Rational_Box :
  rational_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int8_t
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val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Grid : grid -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Float_Box :
  float_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Double_Box :
  double_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint32_Box_with_complexity :
  uint32_box ->
```

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  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_NNC_Polyhedron_with_complexity :
```

```
  polyhedron ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_constraints :
  constraint_system -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_congruences :
  congruence_system -> octagonal_shape_int8_t
val ppl_new_Octagonal_Shape_int8_t_from_generators :
  generator_system -> octagonal_shape_int8_t
val ppl_Octagonal_Shape_int8_t_swap :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_space_dimension :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_affine_dimension :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_relation_with_constraint :
  octagonal_shape_int8_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int8_t_relation_with_generator :
  octagonal_shape_int8_t ->
  linear_generator -> poly_gen_relation list
```

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val ppl_Octagonal_Shape_int8_t_relation_with_congruence :
  octagonal_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_int8_t_get_constraints :
  octagonal_shape_int8_t -> constraint_system
val ppl_Octagonal_Shape_int8_t_get_congruences :
  octagonal_shape_int8_t -> congruence_system
val ppl_Octagonal_Shape_int8_t_get_minimized_constraints :
  octagonal_shape_int8_t -> constraint_system
val ppl_Octagonal_Shape_int8_t_get_minimized_congruences :
  octagonal_shape_int8_t -> congruence_system
val ppl_Octagonal_Shape_int8_t_is_empty : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_universe : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_bounded : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_contains_integer_point :
  octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_topologically_closed :
  octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_discrete : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_topological_closure_assign :
  octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_bounds_from_above :
  octagonal_shape_int8_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int8_t_bounds_from_below :
  octagonal_shape_int8_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int8_t_maximize :
  octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int8_t_minimize :
  octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int8_t_maximize_with_point :
  octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int8_t_minimize_with_point :
  octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int8_t_frequency :
  octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int8_t_contains_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_strictly_contains_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_is_disjoint_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_equals_Octagonal_Shape_int8_t :
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  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_OK : octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_add_constraint :
  octagonal_shape_int8_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int8_t_add_congruence :
  octagonal_shape_int8_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int8_t_add_constraints :
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_add_congruences :
  octagonal_shape_int8_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_constraint :
  octagonal_shape_int8_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_congruence :
  octagonal_shape_int8_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_constraints :
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_refine_with_congruences :
  octagonal_shape_int8_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int8_t_intersection_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_upper_bound_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_difference_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_concatenate_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_time_elapse_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_upper_bound_assign_if_exact :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_simplify_using_context_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_Octagonal_Shape_int8_t_constrains :
  octagonal_shape_int8_t -> int -> bool
val ppl_Octagonal_Shape_int8_t_unconstrain_space_dimension :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_unconstrain_space_dimensions :
  octagonal_shape_int8_t -> int list -> unit
val ppl_Octagonal_Shape_int8_t_affine_image :
  octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_affine_preimage :
  octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_bounded_affine_image :
  octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Octagonal_Shape_int8_t_bounded_affine_preimage :
  octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_image :
  octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_preimage :
  octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int8_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int8_t_add_space_dimensions_and_embed :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_add_space_dimensions_and_project :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_remove_space_dimensions :
  octagonal_shape_int8_t -> int list -> unit
val ppl_Octagonal_Shape_int8_t_remove_higher_space_dimensions :
  octagonal_shape_int8_t -> int -> unit
val ppl_Octagonal_Shape_int8_t_expand_space_dimension :
  octagonal_shape_int8_t -> int -> int -> unit
val ppl_Octagonal_Shape_int8_t_fold_space_dimensions :
  octagonal_shape_int8_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int8_t_map_space_dimensions :
  octagonal_shape_int8_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int8_t_drop_some_non_integer_points :
  octagonal_shape_int8_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int8_t_drop_some_non_integer_points_2 :
  octagonal_shape_int8_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int8_t_ascii_dump : octagonal_shape_int8_t -> string
val ppl_Octagonal_Shape_int8_t_external_memory_in_bytes :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_total_memory_in_bytes :
  octagonal_shape_int8_t -> int
val ppl_Octagonal_Shape_int8_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> int -> int
val ppl_Octagonal_Shape_int8_t_BHMZ05_widening_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
```

```
val ppl_Octagonal_Shape_int8_t_widening_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> int -> int
val ppl_Octagonal_Shape_int8_t_widening_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> int -> int
val ppl_Octagonal_Shape_int8_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> int -> int
val ppl_Octagonal_Shape_int8_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int8_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> int -> int
val ppl_Octagonal_Shape_int8_t_CC76_extrapolation_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_CC76_narrowing_assign :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> unit
val ppl_Octagonal_Shape_int8_t_linear_partition :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t * pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int8_t_wrap_assign :
  octagonal_shape_int8_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  polyhedron * polyhedron
```

```
val ppl_termination_test_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t -> octagonal_shape_int8_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int8_t_2 :
  octagonal_shape_int8_t ->
  octagonal_shape_int8_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int16_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int8_Box :
  int8_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int16_Box :
  int16_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int32_Box :
  int32_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int64_Box :
  int64_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Z_Box :
  z_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Rational_Box :
  rational_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int64_t :
```

```
  bd_shape_int64_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Grid :
  grid -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Float_Box :
  float_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Double_Box :
  double_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int32_Box_with_complexity :
```

```
  int32_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int16_t
```

```
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_Octagonal_Shape_long_double_with_complexity
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_constraints :
  constraint_system -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_congruences :
  congruence_system -> octagonal_shape_int16_t
val ppl_new_Octagonal_Shape_int16_t_from_generators :
```

```
  generator_system -> octagonal_shape_int16_t
val ppl_Octagonal_Shape_int16_t_swap :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_space_dimension :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_affine_dimension :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_relation_with_constraint :
  octagonal_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int16_t_relation_with_generator :
  octagonal_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_int16_t_relation_with_congruence :
  octagonal_shape_int16_t ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_int16_t_get_constraints :
  octagonal_shape_int16_t -> constraint_system
val ppl_Octagonal_Shape_int16_t_get_congruences :
  octagonal_shape_int16_t -> congruence_system
val ppl_Octagonal_Shape_int16_t_get_minimized_constraints :
  octagonal_shape_int16_t -> constraint_system
val ppl_Octagonal_Shape_int16_t_get_minimized_congruences :
  octagonal_shape_int16_t -> congruence_system
val ppl_Octagonal_Shape_int16_t_is_empty : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_universe : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_bounded : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_contains_integer_point :
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_topologically_closed :
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_discrete : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_topological_closure_assign :
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_bounds_from_above :
  octagonal_shape_int16_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int16_t_bounds_from_below :
  octagonal_shape_int16_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int16_t_maximize :
  octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int16_t_minimize :
  octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int16_t_maximize_with_point :
  octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
```

```
val ppl_Octagonal_Shape_int16_t_minimize_with_point :
  octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int16_t_frequency :
  octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int16_t_contains_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_strictly_contains_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_is_disjoint_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_equals_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_OK : octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_add_constraint :
  octagonal_shape_int16_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int16_t_add_congruence :
  octagonal_shape_int16_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int16_t_add_constraints :
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_add_congruences :
  octagonal_shape_int16_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_constraint :
  octagonal_shape_int16_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_congruence :
  octagonal_shape_int16_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_constraints :
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_refine_with_congruences :
  octagonal_shape_int16_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int16_t_intersection_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_upper_bound_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_difference_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_concatenate_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_time_elapse_assign :
```

```
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_upper_bound_assign_if_exact :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_simplify_using_context_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_Octagonal_Shape_int16_t_constrains :
  octagonal_shape_int16_t -> int -> bool
val ppl_Octagonal_Shape_int16_t_unconstrain_space_dimension :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_unconstrain_space_dimensions :
  octagonal_shape_int16_t -> int list -> unit
val ppl_Octagonal_Shape_int16_t_affine_image :
  octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_affine_preimage :
  octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_bounded_affine_image :
  octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_bounded_affine_preimage :
  octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_image :
  octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_preimage :
  octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int16_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int16_t_add_space_dimensions_and_embed :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_add_space_dimensions_and_project :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_remove_space_dimensions :
  octagonal_shape_int16_t -> int list -> unit
```

```
val ppl_Octagonal_Shape_int16_t_remove_higher_space_dimensions :
  octagonal_shape_int16_t -> int -> unit
val ppl_Octagonal_Shape_int16_t_expand_space_dimension :
  octagonal_shape_int16_t -> int -> int -> unit
val ppl_Octagonal_Shape_int16_t_fold_space_dimensions :
  octagonal_shape_int16_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int16_t_map_space_dimensions :
  octagonal_shape_int16_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int16_t_drop_some_non_integer_points :
  octagonal_shape_int16_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int16_t_drop_some_non_integer_points_2 :
  octagonal_shape_int16_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int16_t_ascii_dump :
  octagonal_shape_int16_t -> string
val ppl_Octagonal_Shape_int16_t_external_memory_in_bytes :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_total_memory_in_bytes :
  octagonal_shape_int16_t -> int
val ppl_Octagonal_Shape_int16_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> int -> int
val ppl_Octagonal_Shape_int16_t_BHMZ05_widening_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_widening_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> int -> int
val ppl_Octagonal_Shape_int16_t_widening_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int16_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int16_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int16_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> int -> int
val ppl_Octagonal_Shape_int16_t_CC76_extrapolation_assign :
  octagonal_shape_int16_t ->
```

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  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_CC76_narrowing_assign :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Octagonal_Shape_int16_t_linear_partition :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int16_t_wrap_assign :
  octagonal_shape_int16_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int16_t_2 :
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int16_t_2 :
```

```
  octagonal_shape_int16_t ->
  octagonal_shape_int16_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int32_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int8_Box :
  int8_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int16_Box :
  int16_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int32_Box :
  int32_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int64_Box :
  int64_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Z_Box :
  z_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Rational_Box :
  rational_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpq_class :
```

```
  octagonal_shape_mpq_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Grid :
  grid -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Float_Box :
  float_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Double_Box :
  double_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int32_t
```

```
val ppl_new_Octagonal_Shape_int32_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Grid_with_complexity :
  grid ->
```

```
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_Octagonal_Shape_long_double_with_complexity
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_constraints :
  constraint_system -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_congruences :
  congruence_system -> octagonal_shape_int32_t
val ppl_new_Octagonal_Shape_int32_t_from_generators :
  generator_system -> octagonal_shape_int32_t
val ppl_Octagonal_Shape_int32_t_swap :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_space_dimension :
  octagonal_shape_int32_t -> int
val ppl_Octagonal_Shape_int32_t_affine_dimension :
  octagonal_shape_int32_t -> int
val ppl_Octagonal_Shape_int32_t_relation_with_constraint :
  octagonal_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int32_t_relation_with_generator :
  octagonal_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_int32_t_relation_with_congruence :
  octagonal_shape_int32_t ->
  linear_congruence -> poly_con_relation list
```

```
val ppl_Octagonal_Shape_int32_t_get_constraints :
  octagonal_shape_int32_t -> constraint_system
val ppl_Octagonal_Shape_int32_t_get_congruences :
  octagonal_shape_int32_t -> congruence_system
val ppl_Octagonal_Shape_int32_t_get_minimized_constraints :
  octagonal_shape_int32_t -> constraint_system
val ppl_Octagonal_Shape_int32_t_get_minimized_congruences :
  octagonal_shape_int32_t -> congruence_system
val ppl_Octagonal_Shape_int32_t_is_empty : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_universe : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_bounded : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_contains_integer_point :
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_topologically_closed :
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_discrete : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_topological_closure_assign :
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_bounds_from_above :
  octagonal_shape_int32_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int32_t_bounds_from_below :
  octagonal_shape_int32_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int32_t_maximize :
  octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int32_t_minimize :
  octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int32_t_maximize_with_point :
  octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int32_t_minimize_with_point :
  octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int32_t_frequency :
  octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int32_t_contains_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_strictly_contains_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_is_disjoint_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_equals_Octagonal_Shape_int32_t :
```

```
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_OK : octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_add_constraint :
  octagonal_shape_int32_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int32_t_add_congruence :
  octagonal_shape_int32_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int32_t_add_constraints :
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_add_congruences :
  octagonal_shape_int32_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_constraint :
  octagonal_shape_int32_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_congruence :
  octagonal_shape_int32_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_constraints :
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_refine_with_congruences :
  octagonal_shape_int32_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int32_t_intersection_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_upper_bound_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_difference_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_concatenate_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_time_elapse_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_upper_bound_assign_if_exact :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_simplify_using_context_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_Octagonal_Shape_int32_t_constrains :
  octagonal_shape_int32_t -> int -> bool
val ppl_Octagonal_Shape_int32_t_unconstrain_space_dimension :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_unconstrain_space_dimensions :
  octagonal_shape_int32_t -> int list -> unit
val ppl_Octagonal_Shape_int32_t_affine_image :
  octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Octagonal_Shape_int32_t_affine_preimage :
  octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_bounded_affine_image :
  octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_bounded_affine_preimage :
  octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_image :
  octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_preimage :
  octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int32_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int32_t_add_space_dimensions_and_embed :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_add_space_dimensions_and_project :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_remove_space_dimensions :
  octagonal_shape_int32_t -> int list -> unit
val ppl_Octagonal_Shape_int32_t_remove_higher_space_dimensions :
  octagonal_shape_int32_t -> int -> unit
val ppl_Octagonal_Shape_int32_t_expand_space_dimension :
  octagonal_shape_int32_t -> int -> int -> unit
val ppl_Octagonal_Shape_int32_t_fold_space_dimensions :
  octagonal_shape_int32_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int32_t_map_space_dimensions :
  octagonal_shape_int32_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int32_t_drop_some_non_integer_points :
  octagonal_shape_int32_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int32_t_drop_some_non_integer_points_2 :
  octagonal_shape_int32_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int32_t_ascii_dump :
  octagonal_shape_int32_t -> string
val ppl_Octagonal_Shape_int32_t_external_memory_in_bytes :
  octagonal_shape_int32_t -> int
```

```
val ppl_Octagonal_Shape_int32_t_total_memory_in_bytes :
  octagonal_shape_int32_t -> int
val ppl_Octagonal_Shape_int32_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> int -> int
val ppl_Octagonal_Shape_int32_t_BHMZ05_widening_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_widening_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> int -> int
val ppl_Octagonal_Shape_int32_t_widening_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int32_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int32_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int32_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> int -> int
val ppl_Octagonal_Shape_int32_t_CC76_extrapolation_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_CC76_narrowing_assign :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Octagonal_Shape_int32_t_linear_partition :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int32_t_wrap_assign :
  octagonal_shape_int32_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool
```

```
val ppl_termination_test_PR_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int32_t_2 :
  octagonal_shape_int32_t ->
  octagonal_shape_int32_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_int64_t_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int8_Box :
  int8_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int16_Box :
  int16_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int32_Box :
  int32_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int64_Box :
  int64_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint8_Box :
  uint8_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint16_Box :
  uint16_box -> octagonal_shape_int64_t
```

```
val ppl_new_Octagonal_Shape_int64_t_from_Uint32_Box :
  uint32_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint64_Box :
  uint64_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Z_Box :
  z_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Rational_Box :
  rational_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron :
  polyhedron -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Grid :
  grid -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Float_Box :
  float_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Double_Box :
  double_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_int64_t
```

```
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Long_Double_Box :
  long_double_box -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_int64_t
```

```
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
```

```
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_Octagonal_Shape_long_double_with_complexity
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_constraints :
  constraint_system -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_congruences :
  congruence_system -> octagonal_shape_int64_t
val ppl_new_Octagonal_Shape_int64_t_from_generators :
  generator_system -> octagonal_shape_int64_t
val ppl_Octagonal_Shape_int64_t_swap :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_space_dimension :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_affine_dimension :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_relation_with_constraint :
  octagonal_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_int64_t_relation_with_generator :
  octagonal_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_int64_t_relation_with_congruence :
  octagonal_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_int64_t_get_constraints :
  octagonal_shape_int64_t -> constraint_system
val ppl_Octagonal_Shape_int64_t_get_congruences :
  octagonal_shape_int64_t -> congruence_system
val ppl_Octagonal_Shape_int64_t_get_minimized_constraints :
  octagonal_shape_int64_t -> constraint_system
val ppl_Octagonal_Shape_int64_t_get_minimized_congruences :
  octagonal_shape_int64_t -> congruence_system
val ppl_Octagonal_Shape_int64_t_is_empty : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_universe : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_bounded : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_contains_integer_point :
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_topologically_closed :
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_discrete : octagonal_shape_int64_t -> bool
```

```
val ppl_Octagonal_Shape_int64_t_topological_closure_assign :
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_bounds_from_above :
  octagonal_shape_int64_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int64_t_bounds_from_below :
  octagonal_shape_int64_t -> linear_expression -> bool
val ppl_Octagonal_Shape_int64_t_maximize :
  octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int64_t_minimize :
  octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_int64_t_maximize_with_point :
  octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int64_t_minimize_with_point :
  octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_int64_t_frequency :
  octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_int64_t_contains_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_strictly_contains_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_is_disjoint_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_equals_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_OK : octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_add_constraint :
  octagonal_shape_int64_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int64_t_add_congruence :
  octagonal_shape_int64_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int64_t_add_constraints :
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_add_congruences :
  octagonal_shape_int64_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_constraint :
  octagonal_shape_int64_t -> linear_constraint -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_congruence :
  octagonal_shape_int64_t -> linear_congruence -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_constraints :
```

```
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_refine_with_congruences :
  octagonal_shape_int64_t -> congruence_system -> unit
val ppl_Octagonal_Shape_int64_t_intersection_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_upper_bound_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_difference_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_concatenate_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_time_elapse_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_upper_bound_assign_if_exact :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_simplify_using_context_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_Octagonal_Shape_int64_t_constrains :
  octagonal_shape_int64_t -> int -> bool
val ppl_Octagonal_Shape_int64_t_unconstrain_space_dimension :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_unconstrain_space_dimensions :
  octagonal_shape_int64_t -> int list -> unit
val ppl_Octagonal_Shape_int64_t_affine_image :
  octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_affine_preimage :
  octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_bounded_affine_image :
  octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_bounded_affine_preimage :
  octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_image :
  octagonal_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_preimage :
  octagonal_shape_int64_t ->
```

```
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_image_lhs_rhs :
  octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int64_t_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_int64_t_add_space_dimensions_and_embed :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_add_space_dimensions_and_project :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_remove_space_dimensions :
  octagonal_shape_int64_t -> int list -> unit
val ppl_Octagonal_Shape_int64_t_remove_higher_space_dimensions :
  octagonal_shape_int64_t -> int -> unit
val ppl_Octagonal_Shape_int64_t_expand_space_dimension :
  octagonal_shape_int64_t -> int -> int -> unit
val ppl_Octagonal_Shape_int64_t_fold_space_dimensions :
  octagonal_shape_int64_t -> int list -> int -> unit
val ppl_Octagonal_Shape_int64_t_map_space_dimensions :
  octagonal_shape_int64_t -> (int * int) list -> unit
val ppl_Octagonal_Shape_int64_t_drop_some_non_integer_points :
  octagonal_shape_int64_t -> complexity_class -> unit
val ppl_Octagonal_Shape_int64_t_drop_some_non_integer_points_2 :
  octagonal_shape_int64_t ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_int64_t_ascii_dump :
  octagonal_shape_int64_t -> string
val ppl_Octagonal_Shape_int64_t_external_memory_in_bytes :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_total_memory_in_bytes :
  octagonal_shape_int64_t -> int
val ppl_Octagonal_Shape_int64_t_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> int -> int
val ppl_Octagonal_Shape_int64_t_BHMZ05_widening_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_widening_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> int -> int
val ppl_Octagonal_Shape_int64_t_widening_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_int64_t ->
```

```
  octagonal_shape_int64_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int64_t_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_int64_t_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_limited_CC76_extrapolation_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> constraint_system -> unit
val ppl_Octagonal_Shape_int64_t_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> int -> int
val ppl_Octagonal_Shape_int64_t_CC76_extrapolation_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_CC76_narrowing_assign :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Octagonal_Shape_int64_t_linear_partition :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_int64_t_wrap_assign :
  octagonal_shape_int64_t ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
```

```
  octagonal_shape_int64_t -> bool
val ppl_termination_test_PR_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_int64_t_2 :
  octagonal_shape_int64_t ->
  octagonal_shape_int64_t ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_mpz_class_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box :
  int8_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box :
  int16_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box :
  int32_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box :
  int64_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint8_Box :
  uint8_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint16_Box :
  uint16_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint32_Box :
  uint32_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint64_Box :
  uint64_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Z_Box :
  z_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box :
  rational_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int64_t :
```

```
  bd_shape_int64_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron :
  polyhedron -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Grid :
  grid -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Float_Box :
  float_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Double_Box :
  double_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box :
  long_double_box -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int32_Box_with_complexity :
```

```
  int32_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_mpz_class
```

```
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_class_with_complexity
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpq_class_with_complexity
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_Octagonal_Shape_long_double_with_complexit
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_constraints :
  constraint_system -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_congruences :
  congruence_system -> octagonal_shape_mpz_class
val ppl_new_Octagonal_Shape_mpz_class_from_generators :
```

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  generator_system -> octagonal_shape_mpz_class
val ppl_Octagonal_Shape_mpz_class_swap :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_space_dimension :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_affine_dimension :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_relation_with_constraint :
  octagonal_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_mpz_class_relation_with_generator :
  octagonal_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_mpz_class_relation_with_congruence :
  octagonal_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_mpz_class_get_constraints :
  octagonal_shape_mpz_class -> constraint_system
val ppl_Octagonal_Shape_mpz_class_get_congruences :
  octagonal_shape_mpz_class -> congruence_system
val ppl_Octagonal_Shape_mpz_class_get_minimized_constraints :
  octagonal_shape_mpz_class -> constraint_system
val ppl_Octagonal_Shape_mpz_class_get_minimized_congruences :
  octagonal_shape_mpz_class -> congruence_system
val ppl_Octagonal_Shape_mpz_class_is_empty :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_universe :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_bounded :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_contains_integer_point :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_topologically_closed :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_discrete :
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_topological_closure_assign :
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_bounds_from_above :
  octagonal_shape_mpz_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpz_class_bounds_from_below :
  octagonal_shape_mpz_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpz_class_maximize :
  octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_mpz_class_minimize :
  octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
```

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val ppl_Octagonal_Shape_mpz_class_maximize_with_point :
  octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpz_class_minimize_with_point :
  octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpz_class_frequency :
  octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_mpz_class_contains_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_strictly_contains_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_is_disjoint_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_equals_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_OK : octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_add_constraint :
  octagonal_shape_mpz_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpz_class_add_congruence :
  octagonal_shape_mpz_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpz_class_add_constraints :
  octagonal_shape_mpz_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpz_class_add_congruences :
  octagonal_shape_mpz_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_constraint :
  octagonal_shape_mpz_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_congruence :
  octagonal_shape_mpz_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_constraints :
  octagonal_shape_mpz_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpz_class_refine_with_congruences :
  octagonal_shape_mpz_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpz_class_intersection_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_upper_bound_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_difference_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
```

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val ppl_Octagonal_Shape_mpz_class_concatenate_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_time_elapse_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_upper_bound_assign_if_exact :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_simplify_using_context_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_Octagonal_Shape_mpz_class_constrains :
  octagonal_shape_mpz_class -> int -> bool
val ppl_Octagonal_Shape_mpz_class_unconstrain_space_dimension :
  octagonal_shape_mpz_class -> int -> unit
val ppl_Octagonal_Shape_mpz_class_unconstrain_space_dimensions :
  octagonal_shape_mpz_class -> int list -> unit
val ppl_Octagonal_Shape_mpz_class_affine_image :
  octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_affine_preimage :
  octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_bounded_affine_image :
  octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_bounded_affine_preimage :
  octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_image :
  octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_preimage :
  octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_image_lhs_rhs :
  octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpz_class_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpz_class_add_space_dimensions_and_embed :
  octagonal_shape_mpz_class -> int -> unit
```

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val ppl_Octagonal_Shape_mpz_class_add_space_dimensions_and_project :
  octagonal_shape_mpz_class -> int -> unit
val ppl_Octagonal_Shape_mpz_class_remove_space_dimensions :
  octagonal_shape_mpz_class -> int list -> unit
val ppl_Octagonal_Shape_mpz_class_remove_higher_space_dimensions :
  octagonal_shape_mpz_class -> int -> unit
val ppl_Octagonal_Shape_mpz_class_expand_space_dimension :
  octagonal_shape_mpz_class -> int -> int -> unit
val ppl_Octagonal_Shape_mpz_class_fold_space_dimensions :
  octagonal_shape_mpz_class -> int list -> int -> unit
val ppl_Octagonal_Shape_mpz_class_map_space_dimensions :
  octagonal_shape_mpz_class -> (int * int) list -> unit
val ppl_Octagonal_Shape_mpz_class_drop_some_non_integer_points :
  octagonal_shape_mpz_class -> complexity_class -> unit
val ppl_Octagonal_Shape_mpz_class_drop_some_non_integer_points_2 :
  octagonal_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_mpz_class_ascii_dump :
  octagonal_shape_mpz_class -> string
val ppl_Octagonal_Shape_mpz_class_external_memory_in_bytes :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_total_memory_in_bytes :
  octagonal_shape_mpz_class -> int
val ppl_Octagonal_Shape_mpz_class_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> int -> int
val ppl_Octagonal_Shape_mpz_class_BHMZ05_widening_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_widening_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> int -> int
val ppl_Octagonal_Shape_mpz_class_widening_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpz_class_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpz_class_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpz_class_limited_CC76_extrapolation_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> constraint_system -> unit
```

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val ppl_Octagonal_Shape_mpz_class_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> int -> int
val ppl_Octagonal_Shape_mpz_class_CC76_extrapolation_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_CC76_narrowing_assign :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Octagonal_Shape_mpz_class_linear_partition :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_mpz_class_wrap_assign :
  octagonal_shape_mpz_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
```

```
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpz_class_2 :
  octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class ->
  polyhedron * polyhedron
val ppl_new_Octagonal_Shape_mpq_class_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box :
  int8_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box :
  int16_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box :
  int32_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box :
  int64_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint8_Box :
  uint8_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint16_Box :
  uint16_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint32_Box :
  uint32_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint64_Box :
  uint64_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Z_Box :
  z_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Rational_Box :
  rational_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_mpq_class
```

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val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron :
  polyhedron -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Grid :
  grid -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Float_Box :
  float_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Double_Box :
  double_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Long_Double_Box :
  long_double_box -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint32_Box_with_complexity :
```

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  uint32_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpz_class_with_complexity
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_class_with_complexity
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpq_class
```

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val ppl_new_Octagonal_Shape_mpq_class_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_Octagonal_Shape_long_double_with_complexit
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_constraints :
  constraint_system -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_congruences :
  congruence_system -> octagonal_shape_mpq_class
val ppl_new_Octagonal_Shape_mpq_class_from_generators :
  generator_system -> octagonal_shape_mpq_class
val ppl_Octagonal_Shape_mpq_class_swap :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_space_dimension :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_affine_dimension :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_relation_with_constraint :
  octagonal_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_mpq_class_relation_with_generator :
```

```
  octagonal_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_mpq_class_relation_with_congruence :
  octagonal_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_mpq_class_get_constraints :
  octagonal_shape_mpq_class -> constraint_system
val ppl_Octagonal_Shape_mpq_class_get_congruences :
  octagonal_shape_mpq_class -> congruence_system
val ppl_Octagonal_Shape_mpq_class_get_minimized_constraints :
  octagonal_shape_mpq_class -> constraint_system
val ppl_Octagonal_Shape_mpq_class_get_minimized_congruences :
  octagonal_shape_mpq_class -> congruence_system
val ppl_Octagonal_Shape_mpq_class_is_empty :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_universe :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_bounded :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_contains_integer_point :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_topologically_closed :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_discrete :
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_topological_closure_assign :
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_bounds_from_above :
  octagonal_shape_mpq_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpq_class_bounds_from_below :
  octagonal_shape_mpq_class -> linear_expression -> bool
val ppl_Octagonal_Shape_mpq_class_maximize :
  octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_mpq_class_minimize :
  octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_mpq_class_maximize_with_point :
  octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpq_class_minimize_with_point :
  octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_mpq_class_frequency :
  octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_mpq_class_contains_Octagonal_Shape_mpq_class :
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  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_strictly_contains_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_is_disjoint_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_equals_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_OK : octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_add_constraint :
  octagonal_shape_mpq_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpq_class_add_congruence :
  octagonal_shape_mpq_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpq_class_add_constraints :
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_add_congruences :
  octagonal_shape_mpq_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_constraint :
  octagonal_shape_mpq_class -> linear_constraint -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_congruence :
  octagonal_shape_mpq_class -> linear_congruence -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_constraints :
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_refine_with_congruences :
  octagonal_shape_mpq_class -> congruence_system -> unit
val ppl_Octagonal_Shape_mpq_class_intersection_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_upper_bound_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_difference_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_concatenate_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_time_elapse_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_upper_bound_assign_if_exact :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_Octagonal_Shape_mpq_class_simplify_using_context_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
```

```
val ppl_Octagonal_Shape_mpq_class_constrains :
  octagonal_shape_mpq_class -> int -> bool
val ppl_Octagonal_Shape_mpq_class_unconstrain_space_dimension :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_unconstrain_space_dimensions :
  octagonal_shape_mpq_class -> int list -> unit
val ppl_Octagonal_Shape_mpq_class_affine_image :
  octagonal_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_affine_preimage :
  octagonal_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_bounded_affine_image :
  octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_bounded_affine_preimage :
  octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_image :
  octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_preimage :
  octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_image_lhs_rhs :
  octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpq_class_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_mpq_class_add_space_dimensions_and_embed :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_add_space_dimensions_and_project :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_remove_space_dimensions :
  octagonal_shape_mpq_class -> int list -> unit
val ppl_Octagonal_Shape_mpq_class_remove_higher_space_dimensions :
  octagonal_shape_mpq_class -> int -> unit
val ppl_Octagonal_Shape_mpq_class_expand_space_dimension :
  octagonal_shape_mpq_class -> int -> int -> unit
val ppl_Octagonal_Shape_mpq_class_fold_space_dimensions :
  octagonal_shape_mpq_class -> int list -> int -> unit
val ppl_Octagonal_Shape_mpq_class_map_space_dimensions :
  octagonal_shape_mpq_class -> (int * int) list -> unit
```

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val ppl_Octagonal_Shape_mpq_class_drop_some_non_integer_points :
  octagonal_shape_mpq_class -> complexity_class -> unit
val ppl_Octagonal_Shape_mpq_class_drop_some_non_integer_points_2 :
  octagonal_shape_mpq_class ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_mpq_class_ascii_dump :
  octagonal_shape_mpq_class -> string
val ppl_Octagonal_Shape_mpq_class_external_memory_in_bytes :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_total_memory_in_bytes :
  octagonal_shape_mpq_class -> int
val ppl_Octagonal_Shape_mpq_class_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> int -> int
val ppl_Octagonal_Shape_mpq_class_BHMZ05_widening_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_widening_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> int -> int
val ppl_Octagonal_Shape_mpq_class_widening_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpq_class_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_mpq_class_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_limited_CC76_extrapolation_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> constraint_system -> unit
val ppl_Octagonal_Shape_mpq_class_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> int -> int
val ppl_Octagonal_Shape_mpq_class_CC76_extrapolation_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_CC76_narrowing_assign :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Octagonal_Shape_mpq_class_linear_partition :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class *
```

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  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_mpq_class_wrap_assign :
  octagonal_shape_mpq_class ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_termination_test_PR_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_mpq_class_2 :
  octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class ->
  polyhedron * polyhedron
val ppl_new_C_Polyhedron_from_space_dimension :
  int -> degenerate_element -> polyhedron
val ppl_new_NNC_Polyhedron_from_space_dimension :
  int -> degenerate_element -> polyhedron
val ppl_new_C_Polyhedron_from_Int8_Box : int8_box -> polyhedron
```

```
val ppl_new_NNC_Polyhedron_from_Int8_Box : int8_box -> polyhedron
val ppl_new_C_Polyhedron_from_Int16_Box : int16_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int16_Box : int16_box -> polyhedron
val ppl_new_C_Polyhedron_from_Int32_Box : int32_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int32_Box : int32_box -> polyhedron
val ppl_new_C_Polyhedron_from_Int64_Box : int64_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int64_Box : int64_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint8_Box : uint8_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint8_Box : uint8_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint16_Box : uint16_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint16_Box : uint16_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint32_Box : uint32_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint32_Box : uint32_box -> polyhedron
val ppl_new_C_Polyhedron_from_Uint64_Box : uint64_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint64_Box : uint64_box -> polyhedron
val ppl_new_C_Polyhedron_from_Z_Box : z_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Z_Box : z_box -> polyhedron
val ppl_new_C_Polyhedron_from_Rational_Box : rational_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Rational_Box : rational_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int8_t : bd_shape_int8_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int8_t :
  bd_shape_int8_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> polyhedron
```

```
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> polyhedron
val ppl_new_C_Polyhedron_from_C_Polyhedron : polyhedron -> polyhedron
val ppl_new_NNC_Polyhedron_from_C_Polyhedron : polyhedron -> polyhedron
val ppl_new_C_Polyhedron_from_NNC_Polyhedron : polyhedron -> polyhedron
val ppl_new_NNC_Polyhedron_from_NNC_Polyhedron : polyhedron -> polyhedron
val ppl_new_C_Polyhedron_from_Grid : grid -> polyhedron
val ppl_new_NNC_Polyhedron_from_Grid : grid -> polyhedron
val ppl_new_C_Polyhedron_from_Float_Box : float_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Float_Box : float_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_float : bd_shape_float -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_float : bd_shape_float -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_new_C_Polyhedron_from_Double_Box : double_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Double_Box : double_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_double : bd_shape_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_double :
  bd_shape_double -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_new_C_Polyhedron_from_Long_Double_Box : long_double_box -> polyhedron
val ppl_new_NNC_Polyhedron_from_Long_Double_Box :
  long_double_box -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_long_double :
```

```
  bd_shape_long_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_new_C_Polyhedron_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Z_Box_with_complexity :
  z_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Z_Box_with_complexity :
  z_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int8_t_with_complexity :
```

```
  bd_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> polyhedron
```

```
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Grid_with_complexity :
  grid -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Grid_with_complexity :
  grid -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Float_Box_with_complexity :
  float_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Float_Box_with_complexity :
  float_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> polyhedron
```

```
val ppl_new_C_Polyhedron_from_Double_Box_with_complexity :
  double_box -> complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Double_Box_with_complexity :
  double_box -> complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_NNC_Polyhedron_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> polyhedron
val ppl_new_C_Polyhedron_from_constraints : constraint_system -> polyhedron
val ppl_new_NNC_Polyhedron_from_constraints : constraint_system -> polyhedron
val ppl_new_C_Polyhedron_from_congruences : congruence_system -> polyhedron
val ppl_new_NNC_Polyhedron_from_congruences : congruence_system -> polyhedron
val ppl_new_C_Polyhedron_from_generators : generator_system -> polyhedron
val ppl_new_NNC_Polyhedron_from_generators : generator_system -> polyhedron
val ppl_Polyhedron_swap : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_space_dimension : polyhedron -> int
val ppl_Polyhedron_affine_dimension : polyhedron -> int
val ppl_Polyhedron_relation_with_constraint :
  polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Polyhedron_relation_with_generator :
  polyhedron ->
  linear_generator -> poly_gen_relation list
```

```
val ppl_Polyhedron_relation_with_congruence :
  polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Polyhedron_get_constraints : polyhedron -> constraint_system
val ppl_Polyhedron_get_congruences : polyhedron -> congruence_system
val ppl_Polyhedron_get_generators : polyhedron -> generator_system
val ppl_Polyhedron_get_minimized_constraints :
  polyhedron -> constraint_system
val ppl_Polyhedron_get_minimized_congruences :
  polyhedron -> congruence_system
val ppl_Polyhedron_get_minimized_generators : polyhedron -> generator_system
val ppl_Polyhedron_is_empty : polyhedron -> bool
val ppl_Polyhedron_is_universe : polyhedron -> bool
val ppl_Polyhedron_is_bounded : polyhedron -> bool
val ppl_Polyhedron_contains_integer_point : polyhedron -> bool
val ppl_Polyhedron_is_topologically_closed : polyhedron -> bool
val ppl_Polyhedron_is_discrete : polyhedron -> bool
val ppl_Polyhedron_topological_closure_assign : polyhedron -> unit
val ppl_Polyhedron_bounds_from_above :
  polyhedron -> linear_expression -> bool
val ppl_Polyhedron_bounds_from_below :
  polyhedron -> linear_expression -> bool
val ppl_Polyhedron_maximize :
  polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Polyhedron_minimize :
  polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Polyhedron_maximize_with_point :
  polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Polyhedron_minimize_with_point :
  polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Polyhedron_frequency :
  polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Polyhedron_contains_Polyhedron : polyhedron -> polyhedron -> bool
val ppl_Polyhedron_strictly_contains_Polyhedron :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_is_disjoint_from_Polyhedron :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_equals_Polyhedron : polyhedron -> polyhedron -> bool
val ppl_Polyhedron_OK : polyhedron -> bool
val ppl_Polyhedron_add_constraint : polyhedron -> linear_constraint -> unit
```

```
val ppl_Polyhedron_add_congruence : polyhedron -> linear_congruence -> unit
val ppl_Polyhedron_add_generator : polyhedron -> linear_generator -> unit
val ppl_Polyhedron_add_constraints : polyhedron -> constraint_system -> unit
val ppl_Polyhedron_add_congruences : polyhedron -> congruence_system -> unit
val ppl_Polyhedron_add_generators : polyhedron -> generator_system -> unit
val ppl_Polyhedron_refine_with_constraint :
  polyhedron -> linear_constraint -> unit
val ppl_Polyhedron_refine_with_congruence :
  polyhedron -> linear_congruence -> unit
val ppl_Polyhedron_refine_with_constraints :
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_refine_with_congruences :
  polyhedron -> congruence_system -> unit
val ppl_Polyhedron_intersection_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_upper_bound_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_difference_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_concatenate_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_time_elapse_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_poly_hull_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_poly_difference_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_upper_bound_assign_if_exact :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_poly_hull_assign_if_exact :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_simplify_using_context_assign :
  polyhedron -> polyhedron -> bool
val ppl_Polyhedron_constrains : polyhedron -> int -> bool
val ppl_Polyhedron_unconstrain_space_dimension : polyhedron -> int -> unit
val ppl_Polyhedron_unconstrain_space_dimensions :
  polyhedron -> int list -> unit
val ppl_Polyhedron_affine_image :
  polyhedron -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_affine_preimage :
  polyhedron -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_bounded_affine_image :
  polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_bounded_affine_preimage :
  polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_generalized_affine_image :
  polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_generalized_affine_preimage :
```

```
  polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Polyhedron_generalized_affine_image_lhs_rhs :
  polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Polyhedron_generalized_affine_preimage_lhs_rhs :
  polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Polyhedron_add_space_dimensions_and_embed : polyhedron -> int -> unit
val ppl_Polyhedron_add_space_dimensions_and_project :
  polyhedron -> int -> unit
val ppl_Polyhedron_remove_space_dimensions : polyhedron -> int list -> unit
val ppl_Polyhedron_remove_higher_space_dimensions : polyhedron -> int -> unit
val ppl_Polyhedron_expand_space_dimension : polyhedron -> int -> int -> unit
val ppl_Polyhedron_fold_space_dimensions :
  polyhedron -> int list -> int -> unit
val ppl_Polyhedron_map_space_dimensions :
  polyhedron -> (int * int) list -> unit
val ppl_Polyhedron_drop_some_non_integer_points :
  polyhedron -> complexity_class -> unit
val ppl_Polyhedron_drop_some_non_integer_points_2 :
  polyhedron -> int list -> complexity_class -> unit
val ppl_Polyhedron_ascii_dump : polyhedron -> string
val ppl_Polyhedron_external_memory_in_bytes : polyhedron -> int
val ppl_Polyhedron_total_memory_in_bytes : polyhedron -> int
val ppl_Polyhedron_BHRZ03_widening_assign_with_tokens :
  polyhedron -> polyhedron -> int -> int
val ppl_Polyhedron_H79_widening_assign_with_tokens :
  polyhedron -> polyhedron -> int -> int
val ppl_Polyhedron_BHRZ03_widening_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_H79_widening_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_widening_assign_with_tokens :
  polyhedron -> polyhedron -> int -> int
val ppl_Polyhedron_widening_assign : polyhedron -> polyhedron -> unit
val ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens :
  polyhedron ->
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens :
  polyhedron ->
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens :
  polyhedron ->
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens :
  polyhedron ->
```

```
  polyhedron -> constraint_system -> int -> int
val ppl_Polyhedron_limited_BHRZ03_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_limited_H79_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_bounded_H79_extrapolation_assign :
  polyhedron ->
  polyhedron -> constraint_system -> unit
val ppl_Polyhedron_linear_partition :
  polyhedron ->
  polyhedron ->
  polyhedron * pointset_powerset_nnc_polyhedron
val ppl_Polyhedron_wrap_assign :
  polyhedron ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_C_Polyhedron : polyhedron -> bool
val ppl_termination_test_PR_C_Polyhedron : polyhedron -> bool
val ppl_termination_test_MS_NNC_Polyhedron : polyhedron -> bool
val ppl_termination_test_PR_NNC_Polyhedron : polyhedron -> bool
val ppl_one_affine_ranking_function_MS_C_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_C_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_MS_NNC_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_NNC_Polyhedron :
  polyhedron -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_C_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_C_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_MS_NNC_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_NNC_Polyhedron :
  polyhedron -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_C_Polyhedron :
  polyhedron -> polyhedron * polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron :
  polyhedron -> polyhedron * polyhedron
val ppl_termination_test_MS_C_Polyhedron_2 : polyhedron -> polyhedron -> bool
```

```
val ppl_termination_test_PR_C_Polyhedron_2 : polyhedron -> polyhedron -> bool
val ppl_termination_test_MS_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> bool
val ppl_termination_test_PR_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> bool
val ppl_one_affine_ranking_function_MS_C_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_C_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_MS_NNC_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_NNC_Polyhedron_2 :
  polyhedron ->
  polyhedron -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_C_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_C_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_MS_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_ranking_functions_PR_NNC_Polyhedron_2 :
  polyhedron -> polyhedron -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_C_Polyhedron_2 :
  polyhedron ->
  polyhedron -> polyhedron * polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_NNC_Polyhedron_2 :
  polyhedron ->
  polyhedron -> polyhedron * polyhedron
val ppl_new_Grid_from_space_dimension : int -> degenerate_element -> grid
val ppl_new_Grid_from_Int8_Box : int8_box -> grid
val ppl_new_Grid_from_Int16_Box : int16_box -> grid
val ppl_new_Grid_from_Int32_Box : int32_box -> grid
val ppl_new_Grid_from_Int64_Box : int64_box -> grid
val ppl_new_Grid_from_Uint8_Box : uint8_box -> grid
val ppl_new_Grid_from_Uint16_Box : uint16_box -> grid
val ppl_new_Grid_from_Uint32_Box : uint32_box -> grid
val ppl_new_Grid_from_Uint64_Box : uint64_box -> grid
val ppl_new_Grid_from_Z_Box : z_box -> grid
val ppl_new_Grid_from_Rational_Box : rational_box -> grid
val ppl_new_Grid_from_BD_Shape_int8_t : bd_shape_int8_t -> grid
val ppl_new_Grid_from_BD_Shape_int16_t : bd_shape_int16_t -> grid
val ppl_new_Grid_from_BD_Shape_int32_t : bd_shape_int32_t -> grid
val ppl_new_Grid_from_BD_Shape_int64_t : bd_shape_int64_t -> grid
val ppl_new_Grid_from_BD_Shape_mpz_class : bd_shape_mpz_class -> grid
```

```
val ppl_new_Grid_from_BD_Shape_mpq_class : bd_shape_mpq_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int8_t : octagonal_shape_int8_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> grid
val ppl_new_Grid_from_C_Polyhedron : polyhedron -> grid
val ppl_new_Grid_from_NNC_Polyhedron : polyhedron -> grid
val ppl_new_Grid_from_Grid : grid -> grid
val ppl_new_Grid_from_Float_Box : float_box -> grid
val ppl_new_Grid_from_BD_Shape_float : bd_shape_float -> grid
val ppl_new_Grid_from_Octagonal_Shape_float : octagonal_shape_float -> grid
val ppl_new_Grid_from_Double_Box : double_box -> grid
val ppl_new_Grid_from_BD_Shape_double : bd_shape_double -> grid
val ppl_new_Grid_from_Octagonal_Shape_double : octagonal_shape_double -> grid
val ppl_new_Grid_from_Long_Double_Box : long_double_box -> grid
val ppl_new_Grid_from_BD_Shape_long_double : bd_shape_long_double -> grid
val ppl_new_Grid_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> grid
val ppl_new_Grid_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> grid
val ppl_new_Grid_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> grid
val ppl_new_Grid_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> grid
val ppl_new_Grid_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> grid
val ppl_new_Grid_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> grid
val ppl_new_Grid_from_Z_Box_with_complexity :
  z_box -> complexity_class -> grid
val ppl_new_Grid_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t -> complexity_class -> grid
```

```
val ppl_new_Grid_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class -> complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> grid
val ppl_new_Grid_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> grid
val ppl_new_Grid_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> grid
val ppl_new_Grid_from_Grid_with_complexity : grid -> complexity_class -> grid
val ppl_new_Grid_from_Float_Box_with_complexity :
  float_box -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> grid
val ppl_new_Grid_from_Double_Box_with_complexity :
  double_box -> complexity_class -> grid
val ppl_new_Grid_from_BD_Shape_double_with_complexity :
  bd_shape_double -> complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> grid
val ppl_new_Grid_from_Long_Double_Box_with_complexity :
  long_double_box -> complexity_class -> grid
```

```
val ppl_new_Grid_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> grid
val ppl_new_Grid_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> grid
val ppl_new_Grid_from_constraints : constraint_system -> grid
val ppl_new_Grid_from_congruences : congruence_system -> grid
val ppl_new_Grid_from_grid_generators : grid_generator_system -> grid
val ppl_Grid_swap : grid -> grid -> unit
val ppl_Grid_space_dimension : grid -> int
val ppl_Grid_affine_dimension : grid -> int
val ppl_Grid_relation_with_constraint :
  grid ->
  linear_constraint -> poly_con_relation list
val ppl_Grid_relation_with_generator :
  grid ->
  linear_generator -> poly_gen_relation list
val ppl_Grid_relation_with_congruence :
  grid ->
  linear_congruence -> poly_con_relation list
val ppl_Grid_relation_with_grid_generator :
  grid ->
  linear_grid_generator -> poly_gen_relation list
val ppl_Grid_get_constraints : grid -> constraint_system
val ppl_Grid_get_congruences : grid -> congruence_system
val ppl_Grid_get_grid_generators : grid -> grid_generator_system
val ppl_Grid_get_minimized_constraints : grid -> constraint_system
val ppl_Grid_get_minimized_congruences : grid -> congruence_system
val ppl_Grid_get_minimized_grid_generators : grid -> grid_generator_system
val ppl_Grid_is_empty : grid -> bool
val ppl_Grid_is_universe : grid -> bool
val ppl_Grid_is_bounded : grid -> bool
val ppl_Grid_contains_integer_point : grid -> bool
val ppl_Grid_is_topologically_closed : grid -> bool
val ppl_Grid_is_discrete : grid -> bool
val ppl_Grid_topological_closure_assign : grid -> unit
val ppl_Grid_bounds_from_above : grid -> linear_expression -> bool
val ppl_Grid_bounds_from_below : grid -> linear_expression -> bool
val ppl_Grid_maximize :
  grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Grid_minimize :
  grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Grid_maximize_with_point :
  grid ->
```

```
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Grid_minimize_with_point :
  grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Grid_frequency :
  grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Grid_contains_Grid : grid -> grid -> bool
val ppl_Grid_strictly_contains_Grid : grid -> grid -> bool
val ppl_Grid_is_disjoint_from_Grid : grid -> grid -> bool
val ppl_Grid_equals_Grid : grid -> grid -> bool
val ppl_Grid_OK : grid -> bool
val ppl_Grid_add_constraint : grid -> linear_constraint -> unit
val ppl_Grid_add_congruence : grid -> linear_congruence -> unit
val ppl_Grid_add_grid_generator : grid -> linear_grid_generator -> unit
val ppl_Grid_add_constraints : grid -> constraint_system -> unit
val ppl_Grid_add_congruences : grid -> congruence_system -> unit
val ppl_Grid_add_grid_generators : grid -> grid_generator_system -> unit
val ppl_Grid_refine_with_constraint : grid -> linear_constraint -> unit
val ppl_Grid_refine_with_congruence : grid -> linear_congruence -> unit
val ppl_Grid_refine_with_constraints : grid -> constraint_system -> unit
val ppl_Grid_refine_with_congruences : grid -> congruence_system -> unit
val ppl_Grid_intersection_assign : grid -> grid -> unit
val ppl_Grid_upper_bound_assign : grid -> grid -> unit
val ppl_Grid_difference_assign : grid -> grid -> unit
val ppl_Grid_concatenate_assign : grid -> grid -> unit
val ppl_Grid_time_elapse_assign : grid -> grid -> unit
val ppl_Grid_upper_bound_assign_if_exact : grid -> grid -> bool
val ppl_Grid_simplify_using_context_assign : grid -> grid -> bool
val ppl_Grid_constrains : grid -> int -> bool
val ppl_Grid_unconstrain_space_dimension : grid -> int -> unit
val ppl_Grid_unconstrain_space_dimensions : grid -> int list -> unit
val ppl_Grid_affine_image :
  grid -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_affine_preimage :
  grid -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_bounded_affine_image :
  grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_bounded_affine_preimage :
  grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Grid_generalized_affine_image :
  grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_preimage :
  grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_image_lhs_rhs :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Grid_generalized_affine_preimage_lhs_rhs :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Grid_generalized_affine_image_with_congruence :
  grid ->
  int ->
  relation_symbol ->
  linear_expression -> Gmp.Z.t -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_preimage_with_congruence :
  grid ->
  int ->
  relation_symbol ->
  linear_expression -> Gmp.Z.t -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_image_lhs_rhs_with_congruence :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_generalized_affine_preimage_lhs_rhs_with_congruence :
  grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Grid_add_space_dimensions_and_embed : grid -> int -> unit
val ppl_Grid_add_space_dimensions_and_project : grid -> int -> unit
val ppl_Grid_remove_space_dimensions : grid -> int list -> unit
val ppl_Grid_remove_higher_space_dimensions : grid -> int -> unit
val ppl_Grid_expand_space_dimension : grid -> int -> int -> unit
val ppl_Grid_fold_space_dimensions : grid -> int list -> int -> unit
val ppl_Grid_map_space_dimensions : grid -> (int * int) list -> unit
val ppl_Grid_drop_some_non_integer_points : grid -> complexity_class -> unit
val ppl_Grid_drop_some_non_integer_points_2 :
  grid -> int list -> complexity_class -> unit
val ppl_Grid_ascii_dump : grid -> string
val ppl_Grid_external_memory_in_bytes : grid -> int
val ppl_Grid_total_memory_in_bytes : grid -> int
val ppl_Grid_congruence_widening_assign_with_tokens :
  grid -> grid -> int -> int
```

```
val ppl_Grid_generator_widening_assign_with_tokens :
  grid -> grid -> int -> int
val ppl_Grid_congruence_widening_assign : grid -> grid -> unit
val ppl_Grid_generator_widening_assign : grid -> grid -> unit
val ppl_Grid_widening_assign_with_tokens : grid -> grid -> int -> int
val ppl_Grid_widening_assign : grid -> grid -> unit
val ppl_Grid_limited_congruence_extrapolation_assign_with_tokens :
  grid -> grid -> congruence_system -> int -> int
val ppl_Grid_limited_generator_extrapolation_assign_with_tokens :
  grid -> grid -> congruence_system -> int -> int
val ppl_Grid_limited_congruence_extrapolation_assign :
  grid -> grid -> congruence_system -> unit
val ppl_Grid_limited_generator_extrapolation_assign :
  grid -> grid -> congruence_system -> unit
val ppl_Grid_approximate_partition :
  grid ->
  grid -> grid * pointset_powerset_grid * bool
val ppl_Grid_wrap_assign :
  grid ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Grid : grid -> bool
val ppl_termination_test_PR_Grid : grid -> bool
val ppl_one_affine_ranking_function_MS_Grid : grid -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Grid : grid -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Grid : grid -> polyhedron
val ppl_all_affine_ranking_functions_PR_Grid : grid -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Grid :
  grid -> polyhedron * polyhedron
val ppl_termination_test_MS_Grid_2 : grid -> grid -> bool
val ppl_termination_test_PR_Grid_2 : grid -> grid -> bool
val ppl_one_affine_ranking_function_MS_Grid_2 :
  grid -> grid -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Grid_2 :
  grid -> grid -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Grid_2 : grid -> grid -> polyhedron
val ppl_all_affine_ranking_functions_PR_Grid_2 : grid -> grid -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Grid_2 :
  grid ->
  grid -> polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Int8_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box -> pointset_powerset_int8_box
```

```
val ppl_new_Pointset_Powerset_Int8_Box_from_Int8_Box :
  int8_box -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_Pointset_Powerset_Int8_Box_with_complexit
  pointset_powerset_int8_box ->
  complexity_class -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_constraints :
  constraint_system -> pointset_powerset_int8_box
val ppl_new_Pointset_Powerset_Int8_Box_from_congruences :
  congruence_system -> pointset_powerset_int8_box
val ppl_Pointset_Powerset_Int8_Box_swap :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_space_dimension :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_affine_dimension :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_relation_with_constraint :
  pointset_powerset_int8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int8_Box_relation_with_generator :
  pointset_powerset_int8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int8_Box_relation_with_congruence :
  pointset_powerset_int8_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int8_Box_is_empty :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_universe :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_bounded :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_contains_integer_point :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_topologically_closed :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_discrete :
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_topological_closure_assign :
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_pairwise_reduce :
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_omega_reduce :
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_bounds_from_above :
  pointset_powerset_int8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int8_Box_bounds_from_below :
```

```
  pointset_powerset_int8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int8_Box_maximize :
  pointset_powerset_int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int8_Box_minimize :
  pointset_powerset_int8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int8_Box_maximize_with_point :
  pointset_powerset_int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int8_Box_minimize_with_point :
  pointset_powerset_int8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int8_Box_contains_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_strictly_contains_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_is_disjoint_from_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_geometrically_covers_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_geometrically_equals_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_equals_Pointset_Powerset_Int8_Box :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_OK : pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_add_constraint :
  pointset_powerset_int8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int8_Box_add_congruence :
  pointset_powerset_int8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int8_Box_add_constraints :
  pointset_powerset_int8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int8_Box_add_congruences :
  pointset_powerset_int8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_constraint :
  pointset_powerset_int8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_congruence :
  pointset_powerset_int8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_constraints :
  pointset_powerset_int8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int8_Box_refine_with_congruences :
```

```
  pointset_powerset_int8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int8_Box_intersection_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_upper_bound_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_difference_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_concatenate_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_time_elapse_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_upper_bound_assign_if_exact :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_simplify_using_context_assign :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box -> bool
val ppl_Pointset_Powerset_Int8_Box_constrains :
  pointset_powerset_int8_box -> int -> bool
val ppl_Pointset_Powerset_Int8_Box_unconstrain_space_dimension :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_unconstrain_space_dimensions :
  pointset_powerset_int8_box -> int list -> unit
val ppl_Pointset_Powerset_Int8_Box_affine_image :
  pointset_powerset_int8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_affine_preimage :
  pointset_powerset_int8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_bounded_affine_image :
  pointset_powerset_int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_bounded_affine_preimage :
  pointset_powerset_int8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_image :
  pointset_powerset_int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_preimage :
  pointset_powerset_int8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int8_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int8_Box_add_space_dimensions_and_embed :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_add_space_dimensions_and_project :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_remove_space_dimensions :
  pointset_powerset_int8_box -> int list -> unit
val ppl_Pointset_Powerset_Int8_Box_remove_higher_space_dimensions :
  pointset_powerset_int8_box -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_expand_space_dimension :
  pointset_powerset_int8_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_fold_space_dimensions :
  pointset_powerset_int8_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int8_Box_map_space_dimensions :
  pointset_powerset_int8_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_some_non_integer_points :
  pointset_powerset_int8_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int8_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int8_Box_ascii_dump :
  pointset_powerset_int8_box -> string
val ppl_Pointset_Powerset_Int8_Box_external_memory_in_bytes :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_total_memory_in_bytes :
  pointset_powerset_int8_box -> int
val ppl_Pointset_Powerset_Int8_Box_size : pointset_powerset_int8_box -> int
type pointset_powerset_int8_box_iterator
val ppl_new_Pointset_Powerset_Int8_Box_iterator_from_iterator :
  pointset_powerset_int8_box_iterator ->
  pointset_powerset_int8_box_iterator
val ppl_Pointset_Powerset_Int8_Box_begin_iterator :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator
val ppl_Pointset_Powerset_Int8_Box_end_iterator :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator
val ppl_Pointset_Powerset_Int8_Box_iterator_equals_iterator :
  pointset_powerset_int8_box_iterator ->
  pointset_powerset_int8_box_iterator -> bool
val ppl_Pointset_Powerset_Int8_Box_increment_iterator :
  pointset_powerset_int8_box_iterator -> unit
```

```
val ppl_Pointset_Powerset_Int8_Box_decrement_iterator :
  pointset_powerset_int8_box_iterator -> unit
val ppl_Pointset_Powerset_Int8_Box_get_disjunct :
  pointset_powerset_int8_box_iterator -> int8_box
val ppl_Pointset_Powerset_Int8_Box_add_disjunct :
  pointset_powerset_int8_box -> int8_box -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_disjunct :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator -> unit
val ppl_Pointset_Powerset_Int8_Box_drop_disjuncts :
  pointset_powerset_int8_box ->
  pointset_powerset_int8_box_iterator ->
  pointset_powerset_int8_box_iterator -> unit
val ppl_new_Pointset_Powerset_Int16_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Int16_Box :
  int16_box -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Pointset_Powerset_Int16_Box_with_complex
  pointset_powerset_int16_box ->
  complexity_class -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_constraints :
  constraint_system -> pointset_powerset_int16_box
val ppl_new_Pointset_Powerset_Int16_Box_from_congruences :
  congruence_system -> pointset_powerset_int16_box
val ppl_Pointset_Powerset_Int16_Box_swap :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_space_dimension :
  pointset_powerset_int16_box -> int
val ppl_Pointset_Powerset_Int16_Box_affine_dimension :
  pointset_powerset_int16_box -> int
val ppl_Pointset_Powerset_Int16_Box_relation_with_constraint :
  pointset_powerset_int16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int16_Box_relation_with_generator :
  pointset_powerset_int16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int16_Box_relation_with_congruence :
  pointset_powerset_int16_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int16_Box_is_empty :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_universe :
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```
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_bounded :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_contains_integer_point :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_topologically_closed :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_discrete :
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_topological_closure_assign :
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_pairwise_reduce :
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_omega_reduce :
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_bounds_from_above :
  pointset_powerset_int16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int16_Box_bounds_from_below :
  pointset_powerset_int16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int16_Box_maximize :
  pointset_powerset_int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int16_Box_minimize :
  pointset_powerset_int16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int16_Box_maximize_with_point :
  pointset_powerset_int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int16_Box_minimize_with_point :
  pointset_powerset_int16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int16_Box_contains_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_strictly_contains_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_is_disjoint_from_Pointset_Powerset_Int16_Box :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_geometrically_covers_Pointset_Powerset_Int16_Box
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_geometrically_equals_Pointset_Powerset_Int16_Box
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_equals_Pointset_Powerset_Int16_Box :
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  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_OK : pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_add_constraint :
  pointset_powerset_int16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int16_Box_add_congruence :
  pointset_powerset_int16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int16_Box_add_constraints :
  pointset_powerset_int16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int16_Box_add_congruences :
  pointset_powerset_int16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_constraint :
  pointset_powerset_int16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_congruence :
  pointset_powerset_int16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_constraints :
  pointset_powerset_int16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int16_Box_refine_with_congruences :
  pointset_powerset_int16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int16_Box_intersection_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_upper_bound_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_difference_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_concatenate_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_time_elapse_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_upper_bound_assign_if_exact :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_simplify_using_context_assign :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box -> bool
val ppl_Pointset_Powerset_Int16_Box_constrains :
  pointset_powerset_int16_box -> int -> bool
val ppl_Pointset_Powerset_Int16_Box_unconstrain_space_dimension :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_unconstrain_space_dimensions :
  pointset_powerset_int16_box -> int list -> unit
val ppl_Pointset_Powerset_Int16_Box_affine_image :
  pointset_powerset_int16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Pointset_Powerset_Int16_Box_affine_preimage :
  pointset_powerset_int16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_bounded_affine_image :
  pointset_powerset_int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_bounded_affine_preimage :
  pointset_powerset_int16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_image :
  pointset_powerset_int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_preimage :
  pointset_powerset_int16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int16_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int16_Box_add_space_dimensions_and_embed :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_add_space_dimensions_and_project :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_remove_space_dimensions :
  pointset_powerset_int16_box -> int list -> unit
val ppl_Pointset_Powerset_Int16_Box_remove_higher_space_dimensions :
  pointset_powerset_int16_box -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_expand_space_dimension :
  pointset_powerset_int16_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_fold_space_dimensions :
  pointset_powerset_int16_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int16_Box_map_space_dimensions :
  pointset_powerset_int16_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_some_non_integer_points :
  pointset_powerset_int16_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int16_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int16_Box_ascii_dump :
  pointset_powerset_int16_box -> string
val ppl_Pointset_Powerset_Int16_Box_external_memory_in_bytes :
  pointset_powerset_int16_box -> int
```

```
val ppl_Pointset_Powerset_Int16_Box_total_memory_in_bytes :
  pointset_powerset_int16_box -> int
val ppl_Pointset_Powerset_Int16_Box_size : pointset_powerset_int16_box -> int
type pointset_powerset_int16_box_iterator
val ppl_new_Pointset_Powerset_Int16_Box_iterator_from_iterator :
  pointset_powerset_int16_box_iterator ->
  pointset_powerset_int16_box_iterator
val ppl_Pointset_Powerset_Int16_Box_begin_iterator :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator
val ppl_Pointset_Powerset_Int16_Box_end_iterator :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator
val ppl_Pointset_Powerset_Int16_Box_iterator_equals_iterator :
  pointset_powerset_int16_box_iterator ->
  pointset_powerset_int16_box_iterator -> bool
val ppl_Pointset_Powerset_Int16_Box_increment_iterator :
  pointset_powerset_int16_box_iterator -> unit
val ppl_Pointset_Powerset_Int16_Box_decrement_iterator :
  pointset_powerset_int16_box_iterator -> unit
val ppl_Pointset_Powerset_Int16_Box_get_disjunct :
  pointset_powerset_int16_box_iterator -> int16_box
val ppl_Pointset_Powerset_Int16_Box_add_disjunct :
  pointset_powerset_int16_box -> int16_box -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_disjunct :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator -> unit
val ppl_Pointset_Powerset_Int16_Box_drop_disjuncts :
  pointset_powerset_int16_box ->
  pointset_powerset_int16_box_iterator ->
  pointset_powerset_int16_box_iterator -> unit
val ppl_new_Pointset_Powerset_Int32_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Int32_Box :
  int32_box -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Pointset_Powerset_Int32_Box_with_complex
  pointset_powerset_int32_box ->
  complexity_class -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_constraints :
  constraint_system -> pointset_powerset_int32_box
val ppl_new_Pointset_Powerset_Int32_Box_from_congruences :
  congruence_system -> pointset_powerset_int32_box
val ppl_Pointset_Powerset_Int32_Box_swap :
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```
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_space_dimension :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_affine_dimension :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_relation_with_constraint :
  pointset_powerset_int32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int32_Box_relation_with_generator :
  pointset_powerset_int32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int32_Box_relation_with_congruence :
  pointset_powerset_int32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int32_Box_is_empty :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_universe :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_bounded :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_contains_integer_point :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_topologically_closed :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_discrete :
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_topological_closure_assign :
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_pairwise_reduce :
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_omega_reduce :
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_bounds_from_above :
  pointset_powerset_int32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int32_Box_bounds_from_below :
  pointset_powerset_int32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int32_Box_maximize :
  pointset_powerset_int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int32_Box_minimize :
  pointset_powerset_int32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int32_Box_maximize_with_point :
  pointset_powerset_int32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int32_Box_minimize_with_point :
  pointset_powerset_int32_box ->
```

```
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int32_Box_contains_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_strictly_contains_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_is_disjoint_from_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_geometrically_covers_Pointset_Powerset_Int32_Box
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_geometrically_equals_Pointset_Powerset_Int32_Box
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_equals_Pointset_Powerset_Int32_Box :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_OK : pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_add_constraint :
  pointset_powerset_int32_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int32_Box_add_congruence :
  pointset_powerset_int32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int32_Box_add_constraints :
  pointset_powerset_int32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int32_Box_add_congruences :
  pointset_powerset_int32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_constraint :
  pointset_powerset_int32_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_congruence :
  pointset_powerset_int32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_constraints :
  pointset_powerset_int32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int32_Box_refine_with_congruences :
  pointset_powerset_int32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int32_Box_intersection_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_upper_bound_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_difference_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_concatenate_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
```

```
val ppl_Pointset_Powerset_Int32_Box_time_elapse_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_upper_bound_assign_if_exact :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_simplify_using_context_assign :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box -> bool
val ppl_Pointset_Powerset_Int32_Box_constrains :
  pointset_powerset_int32_box -> int -> bool
val ppl_Pointset_Powerset_Int32_Box_unconstrain_space_dimension :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_unconstrain_space_dimensions :
  pointset_powerset_int32_box -> int list -> unit
val ppl_Pointset_Powerset_Int32_Box_affine_image :
  pointset_powerset_int32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_affine_preimage :
  pointset_powerset_int32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_bounded_affine_image :
  pointset_powerset_int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_bounded_affine_preimage :
  pointset_powerset_int32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_image :
  pointset_powerset_int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_preimage :
  pointset_powerset_int32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int32_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int32_Box_add_space_dimensions_and_embed :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_add_space_dimensions_and_project :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_remove_space_dimensions :
```

```
  pointset_powerset_int32_box -> int list -> unit
val ppl_Pointset_Powerset_Int32_Box_remove_higher_space_dimensions :
  pointset_powerset_int32_box -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_expand_space_dimension :
  pointset_powerset_int32_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_fold_space_dimensions :
  pointset_powerset_int32_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int32_Box_map_space_dimensions :
  pointset_powerset_int32_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_some_non_integer_points :
  pointset_powerset_int32_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int32_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int32_Box_ascii_dump :
  pointset_powerset_int32_box -> string
val ppl_Pointset_Powerset_Int32_Box_external_memory_in_bytes :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_total_memory_in_bytes :
  pointset_powerset_int32_box -> int
val ppl_Pointset_Powerset_Int32_Box_size : pointset_powerset_int32_box -> int
type pointset_powerset_int32_box_iterator
val ppl_new_Pointset_Powerset_Int32_Box_iterator_from_iterator :
  pointset_powerset_int32_box_iterator ->
  pointset_powerset_int32_box_iterator
val ppl_Pointset_Powerset_Int32_Box_begin_iterator :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator
val ppl_Pointset_Powerset_Int32_Box_end_iterator :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator
val ppl_Pointset_Powerset_Int32_Box_iterator_equals_iterator :
  pointset_powerset_int32_box_iterator ->
  pointset_powerset_int32_box_iterator -> bool
val ppl_Pointset_Powerset_Int32_Box_increment_iterator :
  pointset_powerset_int32_box_iterator -> unit
val ppl_Pointset_Powerset_Int32_Box_decrement_iterator :
  pointset_powerset_int32_box_iterator -> unit
val ppl_Pointset_Powerset_Int32_Box_get_disjunct :
  pointset_powerset_int32_box_iterator -> int32_box
val ppl_Pointset_Powerset_Int32_Box_add_disjunct :
  pointset_powerset_int32_box -> int32_box -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_disjunct :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator -> unit
val ppl_Pointset_Powerset_Int32_Box_drop_disjuncts :
  pointset_powerset_int32_box ->
  pointset_powerset_int32_box_iterator ->
  pointset_powerset_int32_box_iterator -> unit
```

```
val ppl_new_Pointset_Powerset_Int64_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Int64_Box :
  int64_box -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Pointset_Powerset_Int64_Box_with_complex
  pointset_powerset_int64_box ->
  complexity_class -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_constraints :
  constraint_system -> pointset_powerset_int64_box
val ppl_new_Pointset_Powerset_Int64_Box_from_congruences :
  congruence_system -> pointset_powerset_int64_box
val ppl_Pointset_Powerset_Int64_Box_swap :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_space_dimension :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_affine_dimension :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_relation_with_constraint :
  pointset_powerset_int64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Int64_Box_relation_with_generator :
  pointset_powerset_int64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Int64_Box_relation_with_congruence :
  pointset_powerset_int64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Int64_Box_is_empty :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_universe :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_bounded :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_contains_integer_point :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_topologically_closed :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_discrete :
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_topological_closure_assign :
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_pairwise_reduce :
  pointset_powerset_int64_box -> unit
```

```
val ppl_Pointset_Powerset_Int64_Box_omega_reduce :
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_bounds_from_above :
  pointset_powerset_int64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int64_Box_bounds_from_below :
  pointset_powerset_int64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Int64_Box_maximize :
  pointset_powerset_int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int64_Box_minimize :
  pointset_powerset_int64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Int64_Box_maximize_with_point :
  pointset_powerset_int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int64_Box_minimize_with_point :
  pointset_powerset_int64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Int64_Box_contains_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_strictly_contains_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_is_disjoint_from_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_geometrically_covers_Pointset_Powerset_Int64_Box
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_geometrically_equals_Pointset_Powerset_Int64_Box
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_equals_Pointset_Powerset_Int64_Box :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_OK : pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_add_constraint :
  pointset_powerset_int64_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Int64_Box_add_congruence :
  pointset_powerset_int64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int64_Box_add_constraints :
  pointset_powerset_int64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int64_Box_add_congruences :
  pointset_powerset_int64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int64_Box_refine_with_constraint :
  pointset_powerset_int64_box -> linear_constraint -> unit
```

```
val ppl_Pointset_Powerset_Int64_Box_refine_with_congruence :
  pointset_powerset_int64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Int64_Box_refine_with_constraints :
  pointset_powerset_int64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Int64_Box_refine_with_congruences :
  pointset_powerset_int64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Int64_Box_intersection_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_upper_bound_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_difference_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_concatenate_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_time_elapse_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_upper_bound_assign_if_exact :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_simplify_using_context_assign :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box -> bool
val ppl_Pointset_Powerset_Int64_Box_constrains :
  pointset_powerset_int64_box -> int -> bool
val ppl_Pointset_Powerset_Int64_Box_unconstrain_space_dimension :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_unconstrain_space_dimensions :
  pointset_powerset_int64_box -> int list -> unit
val ppl_Pointset_Powerset_Int64_Box_affine_image :
  pointset_powerset_int64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_affine_preimage :
  pointset_powerset_int64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_bounded_affine_image :
  pointset_powerset_int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_bounded_affine_preimage :
  pointset_powerset_int64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_image :
  pointset_powerset_int64_box ->
  int ->
```

```
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_preimage :
  pointset_powerset_int64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int64_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_int64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Int64_Box_add_space_dimensions_and_embed :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_add_space_dimensions_and_project :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_remove_space_dimensions :
  pointset_powerset_int64_box -> int list -> unit
val ppl_Pointset_Powerset_Int64_Box_remove_higher_space_dimensions :
  pointset_powerset_int64_box -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_expand_space_dimension :
  pointset_powerset_int64_box -> int -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_fold_space_dimensions :
  pointset_powerset_int64_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Int64_Box_map_space_dimensions :
  pointset_powerset_int64_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_some_non_integer_points :
  pointset_powerset_int64_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_some_non_integer_points_2 :
  pointset_powerset_int64_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Int64_Box_ascii_dump :
  pointset_powerset_int64_box -> string
val ppl_Pointset_Powerset_Int64_Box_external_memory_in_bytes :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_total_memory_in_bytes :
  pointset_powerset_int64_box -> int
val ppl_Pointset_Powerset_Int64_Box_size : pointset_powerset_int64_box -> int
type pointset_powerset_int64_box_iterator
val ppl_new_Pointset_Powerset_Int64_Box_iterator_from_iterator :
  pointset_powerset_int64_box_iterator ->
  pointset_powerset_int64_box_iterator
val ppl_Pointset_Powerset_Int64_Box_begin_iterator :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator
val ppl_Pointset_Powerset_Int64_Box_end_iterator :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator
```

```
val ppl_Pointset_Powerset_Int64_Box_iterator_equals_iterator :
  pointset_powerset_int64_box_iterator ->
  pointset_powerset_int64_box_iterator -> bool
val ppl_Pointset_Powerset_Int64_Box_increment_iterator :
  pointset_powerset_int64_box_iterator -> unit
val ppl_Pointset_Powerset_Int64_Box_decrement_iterator :
  pointset_powerset_int64_box_iterator -> unit
val ppl_Pointset_Powerset_Int64_Box_get_disjunct :
  pointset_powerset_int64_box_iterator -> int64_box
val ppl_Pointset_Powerset_Int64_Box_add_disjunct :
  pointset_powerset_int64_box -> int64_box -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_disjunct :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator -> unit
val ppl_Pointset_Powerset_Int64_Box_drop_disjuncts :
  pointset_powerset_int64_box ->
  pointset_powerset_int64_box_iterator ->
  pointset_powerset_int64_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint8_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Uint8_Box :
  uint8_box -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Pointset_Powerset_Uint8_Box_with_complex
  pointset_powerset_uint8_box ->
  complexity_class -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_constraints :
  constraint_system -> pointset_powerset_uint8_box
val ppl_new_Pointset_Powerset_Uint8_Box_from_congruences :
  congruence_system -> pointset_powerset_uint8_box
val ppl_Pointset_Powerset_Uint8_Box_swap :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_space_dimension :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_affine_dimension :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_relation_with_constraint :
  pointset_powerset_uint8_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint8_Box_relation_with_generator :
  pointset_powerset_uint8_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint8_Box_relation_with_congruence :
```

```
  pointset_powerset_uint8_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint8_Box_is_empty :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_universe :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_bounded :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_contains_integer_point :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_topologically_closed :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_discrete :
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_topological_closure_assign :
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_pairwise_reduce :
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_omega_reduce :
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_bounds_from_above :
  pointset_powerset_uint8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint8_Box_bounds_from_below :
  pointset_powerset_uint8_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint8_Box_maximize :
  pointset_powerset_uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint8_Box_minimize :
  pointset_powerset_uint8_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint8_Box_maximize_with_point :
  pointset_powerset_uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint8_Box_minimize_with_point :
  pointset_powerset_uint8_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint8_Box_contains_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_strictly_contains_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_is_disjoint_from_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_geometrically_covers_Pointset_Powerset_Uint8_Box
  pointset_powerset_uint8_box ->
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```
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_geometrically_equals_Pointset_Powerset_Uint8_Box
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_equals_Pointset_Powerset_Uint8_Box :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_OK : pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_add_constraint :
  pointset_powerset_uint8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_congruence :
  pointset_powerset_uint8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_constraints :
  pointset_powerset_uint8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_congruences :
  pointset_powerset_uint8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_constraint :
  pointset_powerset_uint8_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_congruence :
  pointset_powerset_uint8_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_constraints :
  pointset_powerset_uint8_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_refine_with_congruences :
  pointset_powerset_uint8_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint8_Box_intersection_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_upper_bound_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_difference_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_concatenate_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_time_elapse_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_simplify_using_context_assign :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box -> bool
val ppl_Pointset_Powerset_Uint8_Box_constrains :
  pointset_powerset_uint8_box -> int -> bool
val ppl_Pointset_Powerset_Uint8_Box_unconstrain_space_dimension :
  pointset_powerset_uint8_box -> int -> unit
```

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val ppl_Pointset_Powerset_Uint8_Box_unconstrain_space_dimensions :
  pointset_powerset_uint8_box -> int list -> unit
val ppl_Pointset_Powerset_Uint8_Box_affine_image :
  pointset_powerset_uint8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_affine_preimage :
  pointset_powerset_uint8_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_bounded_affine_image :
  pointset_powerset_uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_bounded_affine_preimage :
  pointset_powerset_uint8_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_image :
  pointset_powerset_uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_preimage :
  pointset_powerset_uint8_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint8_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint8_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint8_box -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_add_space_dimensions_and_project :
  pointset_powerset_uint8_box -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_remove_space_dimensions :
  pointset_powerset_uint8_box -> int list -> unit
val ppl_Pointset_Powerset_Uint8_Box_remove_higher_space_dimensions :
  pointset_powerset_uint8_box -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_expand_space_dimension :
  pointset_powerset_uint8_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_fold_space_dimensions :
  pointset_powerset_uint8_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint8_Box_map_space_dimensions :
  pointset_powerset_uint8_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_some_non_integer_points :
  pointset_powerset_uint8_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint8_box ->
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```
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint8_Box_ascii_dump :
  pointset_powerset_uint8_box -> string
val ppl_Pointset_Powerset_Uint8_Box_external_memory_in_bytes :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_total_memory_in_bytes :
  pointset_powerset_uint8_box -> int
val ppl_Pointset_Powerset_Uint8_Box_size : pointset_powerset_uint8_box -> int
type pointset_powerset_uint8_box_iterator
val ppl_new_Pointset_Powerset_Uint8_Box_iterator_from_iterator :
  pointset_powerset_uint8_box_iterator ->
  pointset_powerset_uint8_box_iterator
val ppl_Pointset_Powerset_Uint8_Box_begin_iterator :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator
val ppl_Pointset_Powerset_Uint8_Box_end_iterator :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator
val ppl_Pointset_Powerset_Uint8_Box_iterator_equals_iterator :
  pointset_powerset_uint8_box_iterator ->
  pointset_powerset_uint8_box_iterator -> bool
val ppl_Pointset_Powerset_Uint8_Box_increment_iterator :
  pointset_powerset_uint8_box_iterator -> unit
val ppl_Pointset_Powerset_Uint8_Box_decrement_iterator :
  pointset_powerset_uint8_box_iterator -> unit
val ppl_Pointset_Powerset_Uint8_Box_get_disjunct :
  pointset_powerset_uint8_box_iterator -> uint8_box
val ppl_Pointset_Powerset_Uint8_Box_add_disjunct :
  pointset_powerset_uint8_box -> uint8_box -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_disjunct :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator -> unit
val ppl_Pointset_Powerset_Uint8_Box_drop_disjuncts :
  pointset_powerset_uint8_box ->
  pointset_powerset_uint8_box_iterator ->
  pointset_powerset_uint8_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint16_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Uint16_Box :
  uint16_box -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Pointset_Powerset_Uint16_Box_with_compl
  pointset_powerset_uint16_box ->
  complexity_class -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> pointset_powerset_uint16_box
```

```
val ppl_new_Pointset_Powerset_Uint16_Box_from_constraints :
  constraint_system -> pointset_powerset_uint16_box
val ppl_new_Pointset_Powerset_Uint16_Box_from_congruences :
  congruence_system -> pointset_powerset_uint16_box
val ppl_Pointset_Powerset_Uint16_Box_swap :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_space_dimension :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_affine_dimension :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_relation_with_constraint :
  pointset_powerset_uint16_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint16_Box_relation_with_generator :
  pointset_powerset_uint16_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint16_Box_relation_with_congruence :
  pointset_powerset_uint16_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint16_Box_is_empty :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_universe :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_bounded :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_contains_integer_point :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_topologically_closed :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_discrete :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_topological_closure_assign :
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_pairwise_reduce :
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_omega_reduce :
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_bounds_from_above :
  pointset_powerset_uint16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint16_Box_bounds_from_below :
  pointset_powerset_uint16_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint16_Box_maximize :
  pointset_powerset_uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint16_Box_minimize :
  pointset_powerset_uint16_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint16_Box_maximize_with_point :
```

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  pointset_powerset_uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint16_Box_minimize_with_point :
  pointset_powerset_uint16_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint16_Box_contains_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_strictly_contains_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_is_disjoint_from_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_geometrically_covers_Pointset_Powerset_Uint16_Bo
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_geometrically_equals_Pointset_Powerset_Uint16_Bo
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_equals_Pointset_Powerset_Uint16_Box :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_OK :
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_add_constraint :
  pointset_powerset_uint16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_congruence :
  pointset_powerset_uint16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_constraints :
  pointset_powerset_uint16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_congruences :
  pointset_powerset_uint16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_constraint :
  pointset_powerset_uint16_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_congruence :
  pointset_powerset_uint16_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_constraints :
  pointset_powerset_uint16_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_refine_with_congruences :
  pointset_powerset_uint16_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint16_Box_intersection_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_upper_bound_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
```

```
val ppl_Pointset_Powerset_Uint16_Box_difference_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_concatenate_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_time_elapse_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> unit
val ppl_Pointset_Powerset_Uint16_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_simplify_using_context_assign :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box -> bool
val ppl_Pointset_Powerset_Uint16_Box_constrains :
  pointset_powerset_uint16_box -> int -> bool
val ppl_Pointset_Powerset_Uint16_Box_unconstrain_space_dimension :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_unconstrain_space_dimensions :
  pointset_powerset_uint16_box -> int list -> unit
val ppl_Pointset_Powerset_Uint16_Box_affine_image :
  pointset_powerset_uint16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_affine_preimage :
  pointset_powerset_uint16_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_bounded_affine_image :
  pointset_powerset_uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_bounded_affine_preimage :
  pointset_powerset_uint16_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_image :
  pointset_powerset_uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_preimage :
  pointset_powerset_uint16_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint16_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint16_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint16_box ->
  linear_expression ->
```

```
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_add_space_dimensions_and_project :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_remove_space_dimensions :
  pointset_powerset_uint16_box -> int list -> unit
val ppl_Pointset_Powerset_Uint16_Box_remove_higher_space_dimensions :
  pointset_powerset_uint16_box -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_expand_space_dimension :
  pointset_powerset_uint16_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_fold_space_dimensions :
  pointset_powerset_uint16_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint16_Box_map_space_dimensions :
  pointset_powerset_uint16_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint16_Box_drop_some_non_integer_points :
  pointset_powerset_uint16_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint16_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint16_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint16_Box_ascii_dump :
  pointset_powerset_uint16_box -> string
val ppl_Pointset_Powerset_Uint16_Box_external_memory_in_bytes :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_total_memory_in_bytes :
  pointset_powerset_uint16_box -> int
val ppl_Pointset_Powerset_Uint16_Box_size :
  pointset_powerset_uint16_box -> int
type pointset_powerset_uint16_box_iterator
val ppl_new_Pointset_Powerset_Uint16_Box_iterator_from_iterator :
  pointset_powerset_uint16_box_iterator ->
  pointset_powerset_uint16_box_iterator
val ppl_Pointset_Powerset_Uint16_Box_begin_iterator :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator
val ppl_Pointset_Powerset_Uint16_Box_end_iterator :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator
val ppl_Pointset_Powerset_Uint16_Box_iterator_equals_iterator :
  pointset_powerset_uint16_box_iterator ->
  pointset_powerset_uint16_box_iterator -> bool
val ppl_Pointset_Powerset_Uint16_Box_increment_iterator :
  pointset_powerset_uint16_box_iterator -> unit
val ppl_Pointset_Powerset_Uint16_Box_decrement_iterator :
  pointset_powerset_uint16_box_iterator -> unit
val ppl_Pointset_Powerset_Uint16_Box_get_disjunct :
  pointset_powerset_uint16_box_iterator -> uint16_box
val ppl_Pointset_Powerset_Uint16_Box_add_disjunct :
  pointset_powerset_uint16_box -> uint16_box -> unit
```

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val ppl_Pointset_Powerset_Uint16_Box_drop_disjunct :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator -> unit
val ppl_Pointset_Powerset_Uint16_Box_drop_disjuncts :
  pointset_powerset_uint16_box ->
  pointset_powerset_uint16_box_iterator ->
  pointset_powerset_uint16_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint32_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Uint32_Box :
  uint32_box -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Pointset_Powerset_Uint32_Box_with_compl
  pointset_powerset_uint32_box ->
  complexity_class -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_constraints :
  constraint_system -> pointset_powerset_uint32_box
val ppl_new_Pointset_Powerset_Uint32_Box_from_congruences :
  congruence_system -> pointset_powerset_uint32_box
val ppl_Pointset_Powerset_Uint32_Box_swap :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_space_dimension :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_affine_dimension :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_relation_with_constraint :
  pointset_powerset_uint32_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint32_Box_relation_with_generator :
  pointset_powerset_uint32_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint32_Box_relation_with_congruence :
  pointset_powerset_uint32_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint32_Box_is_empty :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_universe :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_bounded :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_contains_integer_point :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_topologically_closed :
```

```
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_discrete :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_topological_closure_assign :
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_pairwise_reduce :
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_omega_reduce :
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_bounds_from_above :
  pointset_powerset_uint32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint32_Box_bounds_from_below :
  pointset_powerset_uint32_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint32_Box_maximize :
  pointset_powerset_uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint32_Box_minimize :
  pointset_powerset_uint32_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint32_Box_maximize_with_point :
  pointset_powerset_uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint32_Box_minimize_with_point :
  pointset_powerset_uint32_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint32_Box_contains_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_strictly_contains_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_is_disjoint_from_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_geometrically_covers_Pointset_Powerset_Uint32_Bo
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_geometrically_equals_Pointset_Powerset_Uint32_Bo
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_equals_Pointset_Powerset_Uint32_Box :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_OK :
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_add_constraint :
  pointset_powerset_uint32_box -> linear_constraint -> unit
```

```
val ppl_Pointset_Powerset_Uint32_Box_add_congruence :
  pointset_powerset_uint32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_constraints :
  pointset_powerset_uint32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_congruences :
  pointset_powerset_uint32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_constraint :
  pointset_powerset_uint32_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_congruence :
  pointset_powerset_uint32_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_constraints :
  pointset_powerset_uint32_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_refine_with_congruences :
  pointset_powerset_uint32_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint32_Box_intersection_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_upper_bound_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_difference_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_concatenate_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_time_elapse_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_simplify_using_context_assign :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box -> bool
val ppl_Pointset_Powerset_Uint32_Box_constrains :
  pointset_powerset_uint32_box -> int -> bool
val ppl_Pointset_Powerset_Uint32_Box_unconstrain_space_dimension :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_unconstrain_space_dimensions :
  pointset_powerset_uint32_box -> int list -> unit
val ppl_Pointset_Powerset_Uint32_Box_affine_image :
  pointset_powerset_uint32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_affine_preimage :
  pointset_powerset_uint32_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_bounded_affine_image :
  pointset_powerset_uint32_box ->
```

```
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_bounded_affine_preimage :
  pointset_powerset_uint32_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_image :
  pointset_powerset_uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage :
  pointset_powerset_uint32_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint32_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint32_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_add_space_dimensions_and_project :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_remove_space_dimensions :
  pointset_powerset_uint32_box -> int list -> unit
val ppl_Pointset_Powerset_Uint32_Box_remove_higher_space_dimensions :
  pointset_powerset_uint32_box -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_expand_space_dimension :
  pointset_powerset_uint32_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_fold_space_dimensions :
  pointset_powerset_uint32_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint32_Box_map_space_dimensions :
  pointset_powerset_uint32_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_some_non_integer_points :
  pointset_powerset_uint32_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint32_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint32_Box_ascii_dump :
  pointset_powerset_uint32_box -> string
val ppl_Pointset_Powerset_Uint32_Box_external_memory_in_bytes :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_total_memory_in_bytes :
  pointset_powerset_uint32_box -> int
val ppl_Pointset_Powerset_Uint32_Box_size :
  pointset_powerset_uint32_box -> int
```

```
type pointset_powerset_uint32_box_iterator
val ppl_new_Pointset_Powerset_Uint32_Box_iterator_from_iterator :
  pointset_powerset_uint32_box_iterator ->
  pointset_powerset_uint32_box_iterator
val ppl_Pointset_Powerset_Uint32_Box_begin_iterator :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator
val ppl_Pointset_Powerset_Uint32_Box_end_iterator :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator
val ppl_Pointset_Powerset_Uint32_Box_iterator_equals_iterator :
  pointset_powerset_uint32_box_iterator ->
  pointset_powerset_uint32_box_iterator -> bool
val ppl_Pointset_Powerset_Uint32_Box_increment_iterator :
  pointset_powerset_uint32_box_iterator -> unit
val ppl_Pointset_Powerset_Uint32_Box_decrement_iterator :
  pointset_powerset_uint32_box_iterator -> unit
val ppl_Pointset_Powerset_Uint32_Box_get_disjunct :
  pointset_powerset_uint32_box_iterator -> uint32_box
val ppl_Pointset_Powerset_Uint32_Box_add_disjunct :
  pointset_powerset_uint32_box -> uint32_box -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_disjunct :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator -> unit
val ppl_Pointset_Powerset_Uint32_Box_drop_disjuncts :
  pointset_powerset_uint32_box ->
  pointset_powerset_uint32_box_iterator ->
  pointset_powerset_uint32_box_iterator -> unit
val ppl_new_Pointset_Powerset_Uint64_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Uint64_Box :
  uint64_box -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Pointset_Powerset_Uint64_Box_with_compl
  pointset_powerset_uint64_box ->
  complexity_class -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_constraints :
  constraint_system -> pointset_powerset_uint64_box
val ppl_new_Pointset_Powerset_Uint64_Box_from_congruences :
  congruence_system -> pointset_powerset_uint64_box
val ppl_Pointset_Powerset_Uint64_Box_swap :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_space_dimension :
```

```
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_affine_dimension :
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_relation_with_constraint :
  pointset_powerset_uint64_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Uint64_Box_relation_with_generator :
  pointset_powerset_uint64_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Uint64_Box_relation_with_congruence :
  pointset_powerset_uint64_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Uint64_Box_is_empty :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_universe :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_bounded :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_contains_integer_point :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_topologically_closed :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_discrete :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_topological_closure_assign :
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_pairwise_reduce :
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_omega_reduce :
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_bounds_from_above :
  pointset_powerset_uint64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint64_Box_bounds_from_below :
  pointset_powerset_uint64_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Uint64_Box_maximize :
  pointset_powerset_uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint64_Box_minimize :
  pointset_powerset_uint64_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Uint64_Box_maximize_with_point :
  pointset_powerset_uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint64_Box_minimize_with_point :
  pointset_powerset_uint64_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Uint64_Box_contains_Pointset_Powerset_Uint64_Box :
```

```
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_strictly_contains_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_is_disjoint_from_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_geometrically_covers_Pointset_Powerset_Uint64_Bo
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_geometrically_equals_Pointset_Powerset_Uint64_Bo
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_equals_Pointset_Powerset_Uint64_Box :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_OK :
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_add_constraint :
  pointset_powerset_uint64_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_congruence :
  pointset_powerset_uint64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_constraints :
  pointset_powerset_uint64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_congruences :
  pointset_powerset_uint64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_constraint :
  pointset_powerset_uint64_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_congruence :
  pointset_powerset_uint64_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_constraints :
  pointset_powerset_uint64_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_refine_with_congruences :
  pointset_powerset_uint64_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Uint64_Box_intersection_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_upper_bound_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_difference_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_concatenate_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_time_elapse_assign :
  pointset_powerset_uint64_box ->
```

```
  pointset_powerset_uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_upper_bound_assign_if_exact :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_simplify_using_context_assign :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box -> bool
val ppl_Pointset_Powerset_Uint64_Box_constrains :
  pointset_powerset_uint64_box -> int -> bool
val ppl_Pointset_Powerset_Uint64_Box_unconstrain_space_dimension :
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_unconstrain_space_dimensions :
  pointset_powerset_uint64_box -> int list -> unit
val ppl_Pointset_Powerset_Uint64_Box_affine_image :
  pointset_powerset_uint64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_affine_preimage :
  pointset_powerset_uint64_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_bounded_affine_image :
  pointset_powerset_uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_bounded_affine_preimage :
  pointset_powerset_uint64_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_image :
  pointset_powerset_uint64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_preimage :
  pointset_powerset_uint64_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint64_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_uint64_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_space_dimensions_and_embed :
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_add_space_dimensions_and_project :
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_remove_space_dimensions :
  pointset_powerset_uint64_box -> int list -> unit
val ppl_Pointset_Powerset_Uint64_Box_remove_higher_space_dimensions :
```

```
  pointset_powerset_uint64_box -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_expand_space_dimension :
  pointset_powerset_uint64_box -> int -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_fold_space_dimensions :
  pointset_powerset_uint64_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Uint64_Box_map_space_dimensions :
  pointset_powerset_uint64_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_some_non_integer_points :
  pointset_powerset_uint64_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_some_non_integer_points_2 :
  pointset_powerset_uint64_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Uint64_Box_ascii_dump :
  pointset_powerset_uint64_box -> string
val ppl_Pointset_Powerset_Uint64_Box_external_memory_in_bytes :
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_total_memory_in_bytes :
  pointset_powerset_uint64_box -> int
val ppl_Pointset_Powerset_Uint64_Box_size :
  pointset_powerset_uint64_box -> int
type pointset_powerset_uint64_box_iterator
val ppl_new_Pointset_Powerset_Uint64_Box_iterator_from_iterator :
  pointset_powerset_uint64_box_iterator ->
  pointset_powerset_uint64_box_iterator
val ppl_Pointset_Powerset_Uint64_Box_begin_iterator :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator
val ppl_Pointset_Powerset_Uint64_Box_end_iterator :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator
val ppl_Pointset_Powerset_Uint64_Box_iterator_equals_iterator :
  pointset_powerset_uint64_box_iterator ->
  pointset_powerset_uint64_box_iterator -> bool
val ppl_Pointset_Powerset_Uint64_Box_increment_iterator :
  pointset_powerset_uint64_box_iterator -> unit
val ppl_Pointset_Powerset_Uint64_Box_decrement_iterator :
  pointset_powerset_uint64_box_iterator -> unit
val ppl_Pointset_Powerset_Uint64_Box_get_disjunct :
  pointset_powerset_uint64_box_iterator -> uint64_box
val ppl_Pointset_Powerset_Uint64_Box_add_disjunct :
  pointset_powerset_uint64_box -> uint64_box -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_disjunct :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator -> unit
val ppl_Pointset_Powerset_Uint64_Box_drop_disjuncts :
  pointset_powerset_uint64_box ->
  pointset_powerset_uint64_box_iterator ->
  pointset_powerset_uint64_box_iterator -> unit
val ppl_new_Pointset_Powerset_Rational_Box_from_space_dimension :
```

```
  int ->
  degenerate_element -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Pointset_Powerset_Rational_Box :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Rational_Box :
  rational_box -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Pointset_Powerset_Rational_Box_with_c
  pointset_powerset_rational_box ->
  complexity_class -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_constraints :
  constraint_system -> pointset_powerset_rational_box
val ppl_new_Pointset_Powerset_Rational_Box_from_congruences :
  congruence_system -> pointset_powerset_rational_box
val ppl_Pointset_Powerset_Rational_Box_swap :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_space_dimension :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_affine_dimension :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_relation_with_constraint :
  pointset_powerset_rational_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Rational_Box_relation_with_generator :
  pointset_powerset_rational_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Rational_Box_relation_with_congruence :
  pointset_powerset_rational_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Rational_Box_is_empty :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_universe :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_bounded :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_contains_integer_point :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_topologically_closed :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_discrete :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_topological_closure_assign :
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_pairwise_reduce :
  pointset_powerset_rational_box -> unit
```

```
val ppl_Pointset_Powerset_Rational_Box_omega_reduce :
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_bounds_from_above :
  pointset_powerset_rational_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Rational_Box_bounds_from_below :
  pointset_powerset_rational_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Rational_Box_maximize :
  pointset_powerset_rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Rational_Box_minimize :
  pointset_powerset_rational_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Rational_Box_maximize_with_point :
  pointset_powerset_rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Rational_Box_minimize_with_point :
  pointset_powerset_rational_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Rational_Box_contains_Pointset_Powerset_Rational_Box :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_strictly_contains_Pointset_Powerset_Rational_B
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_is_disjoint_from_Pointset_Powerset_Rational_Bo
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_geometrically_covers_Pointset_Powerset_Rationa
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_geometrically_equals_Pointset_Powerset_Rationa
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_equals_Pointset_Powerset_Rational_Box :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_OK :
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_add_constraint :
  pointset_powerset_rational_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Rational_Box_add_congruence :
  pointset_powerset_rational_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Rational_Box_add_constraints :
  pointset_powerset_rational_box ->
```

```
  constraint_system -> unit
val ppl_Pointset_Powerset_Rational_Box_add_congruences :
  pointset_powerset_rational_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_constraint :
  pointset_powerset_rational_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_congruence :
  pointset_powerset_rational_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_constraints :
  pointset_powerset_rational_box ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Rational_Box_refine_with_congruences :
  pointset_powerset_rational_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Rational_Box_intersection_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_upper_bound_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_difference_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_concatenate_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_time_elapse_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_upper_bound_assign_if_exact :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_simplify_using_context_assign :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box -> bool
val ppl_Pointset_Powerset_Rational_Box_constrains :
  pointset_powerset_rational_box -> int -> bool
val ppl_Pointset_Powerset_Rational_Box_unconstrain_space_dimension :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_unconstrain_space_dimensions :
  pointset_powerset_rational_box -> int list -> unit
val ppl_Pointset_Powerset_Rational_Box_affine_image :
  pointset_powerset_rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_affine_preimage :
  pointset_powerset_rational_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_bounded_affine_image :
```

```
  pointset_powerset_rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_bounded_affine_preimage :
  pointset_powerset_rational_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_image :
  pointset_powerset_rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_preimage :
  pointset_powerset_rational_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Rational_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_rational_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Rational_Box_add_space_dimensions_and_embed :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_add_space_dimensions_and_project :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_remove_space_dimensions :
  pointset_powerset_rational_box -> int list -> unit
val ppl_Pointset_Powerset_Rational_Box_remove_higher_space_dimensions :
  pointset_powerset_rational_box -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_expand_space_dimension :
  pointset_powerset_rational_box -> int -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_fold_space_dimensions :
  pointset_powerset_rational_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Rational_Box_map_space_dimensions :
  pointset_powerset_rational_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_some_non_integer_points :
  pointset_powerset_rational_box ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_some_non_integer_points_2 :
  pointset_powerset_rational_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Rational_Box_ascii_dump :
  pointset_powerset_rational_box -> string
val ppl_Pointset_Powerset_Rational_Box_external_memory_in_bytes :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_total_memory_in_bytes :
  pointset_powerset_rational_box -> int
val ppl_Pointset_Powerset_Rational_Box_size :
```

```
  pointset_powerset_rational_box -> int
type pointset_powerset_rational_box_iterator
val ppl_new_Pointset_Powerset_Rational_Box_iterator_from_iterator :
  pointset_powerset_rational_box_iterator ->
  pointset_powerset_rational_box_iterator
val ppl_Pointset_Powerset_Rational_Box_begin_iterator :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator
val ppl_Pointset_Powerset_Rational_Box_end_iterator :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator
val ppl_Pointset_Powerset_Rational_Box_iterator_equals_iterator :
  pointset_powerset_rational_box_iterator ->
  pointset_powerset_rational_box_iterator -> bool
val ppl_Pointset_Powerset_Rational_Box_increment_iterator :
  pointset_powerset_rational_box_iterator -> unit
val ppl_Pointset_Powerset_Rational_Box_decrement_iterator :
  pointset_powerset_rational_box_iterator -> unit
val ppl_Pointset_Powerset_Rational_Box_get_disjunct :
  pointset_powerset_rational_box_iterator -> rational_box
val ppl_Pointset_Powerset_Rational_Box_add_disjunct :
  pointset_powerset_rational_box -> rational_box -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_disjunct :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator -> unit
val ppl_Pointset_Powerset_Rational_Box_drop_disjuncts :
  pointset_powerset_rational_box ->
  pointset_powerset_rational_box_iterator ->
  pointset_powerset_rational_box_iterator -> unit
val ppl_new_Pointset_Powerset_Z_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Z_Box :
  z_box -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Pointset_Powerset_Z_Box_with_complexity :
  pointset_powerset_z_box ->
  complexity_class -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_constraints :
  constraint_system -> pointset_powerset_z_box
val ppl_new_Pointset_Powerset_Z_Box_from_congruences :
  congruence_system -> pointset_powerset_z_box
val ppl_Pointset_Powerset_Z_Box_swap :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_space_dimension :
```

```
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_affine_dimension :
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_relation_with_constraint :
  pointset_powerset_z_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Z_Box_relation_with_generator :
  pointset_powerset_z_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Z_Box_relation_with_congruence :
  pointset_powerset_z_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Z_Box_is_empty : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_universe : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_bounded : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_contains_integer_point :
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_topologically_closed :
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_discrete : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_topological_closure_assign :
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_pairwise_reduce :
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_omega_reduce :
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_bounds_from_above :
  pointset_powerset_z_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Z_Box_bounds_from_below :
  pointset_powerset_z_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Z_Box_maximize :
  pointset_powerset_z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Z_Box_minimize :
  pointset_powerset_z_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Z_Box_maximize_with_point :
  pointset_powerset_z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Z_Box_minimize_with_point :
  pointset_powerset_z_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Z_Box_contains_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_strictly_contains_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
```

```
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_is_disjoint_from_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_geometrically_covers_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_geometrically_equals_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_equals_Pointset_Powerset_Z_Box :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_OK : pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_add_constraint :
  pointset_powerset_z_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Z_Box_add_congruence :
  pointset_powerset_z_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Z_Box_add_constraints :
  pointset_powerset_z_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Z_Box_add_congruences :
  pointset_powerset_z_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_constraint :
  pointset_powerset_z_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_congruence :
  pointset_powerset_z_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_constraints :
  pointset_powerset_z_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Z_Box_refine_with_congruences :
  pointset_powerset_z_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Z_Box_intersection_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_upper_bound_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_difference_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_concatenate_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_time_elapse_assign :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> unit
val ppl_Pointset_Powerset_Z_Box_upper_bound_assign_if_exact :
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_simplify_using_context_assign :
```

```
  pointset_powerset_z_box ->
  pointset_powerset_z_box -> bool
val ppl_Pointset_Powerset_Z_Box_constrains :
  pointset_powerset_z_box -> int -> bool
val ppl_Pointset_Powerset_Z_Box_unconstrain_space_dimension :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_unconstrain_space_dimensions :
  pointset_powerset_z_box -> int list -> unit
val ppl_Pointset_Powerset_Z_Box_affine_image :
  pointset_powerset_z_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_affine_preimage :
  pointset_powerset_z_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_bounded_affine_image :
  pointset_powerset_z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_bounded_affine_preimage :
  pointset_powerset_z_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_image :
  pointset_powerset_z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_preimage :
  pointset_powerset_z_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_z_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Z_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_z_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Z_Box_add_space_dimensions_and_embed :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_add_space_dimensions_and_project :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_remove_space_dimensions :
  pointset_powerset_z_box -> int list -> unit
val ppl_Pointset_Powerset_Z_Box_remove_higher_space_dimensions :
  pointset_powerset_z_box -> int -> unit
val ppl_Pointset_Powerset_Z_Box_expand_space_dimension :
  pointset_powerset_z_box -> int -> int -> unit
val ppl_Pointset_Powerset_Z_Box_fold_space_dimensions :
  pointset_powerset_z_box -> int list -> int -> unit
```

```
val ppl_Pointset_Powerset_Z_Box_map_space_dimensions :
  pointset_powerset_z_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Z_Box_drop_some_non_integer_points :
  pointset_powerset_z_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Z_Box_drop_some_non_integer_points_2 :
  pointset_powerset_z_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Z_Box_ascii_dump :
  pointset_powerset_z_box -> string
val ppl_Pointset_Powerset_Z_Box_external_memory_in_bytes :
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_total_memory_in_bytes :
  pointset_powerset_z_box -> int
val ppl_Pointset_Powerset_Z_Box_size : pointset_powerset_z_box -> int
type pointset_powerset_z_box_iterator
val ppl_new_Pointset_Powerset_Z_Box_iterator_from_iterator :
  pointset_powerset_z_box_iterator ->
  pointset_powerset_z_box_iterator
val ppl_Pointset_Powerset_Z_Box_begin_iterator :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator
val ppl_Pointset_Powerset_Z_Box_end_iterator :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator
val ppl_Pointset_Powerset_Z_Box_iterator_equals_iterator :
  pointset_powerset_z_box_iterator ->
  pointset_powerset_z_box_iterator -> bool
val ppl_Pointset_Powerset_Z_Box_increment_iterator :
  pointset_powerset_z_box_iterator -> unit
val ppl_Pointset_Powerset_Z_Box_decrement_iterator :
  pointset_powerset_z_box_iterator -> unit
val ppl_Pointset_Powerset_Z_Box_get_disjunct :
  pointset_powerset_z_box_iterator -> z_box
val ppl_Pointset_Powerset_Z_Box_add_disjunct :
  pointset_powerset_z_box -> z_box -> unit
val ppl_Pointset_Powerset_Z_Box_drop_disjunct :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator -> unit
val ppl_Pointset_Powerset_Z_Box_drop_disjuncts :
  pointset_powerset_z_box ->
  pointset_powerset_z_box_iterator ->
  pointset_powerset_z_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_Pointset_Powerset_BD_Shape_int8_t
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_BD_Shape_int8_t :
```

```
  bd_shape_int8_t -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_Pointset_Powerset_BD_Shape_int8_t_
  pointset_powerset_bd_shape_int8_t ->
  complexity_class -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int8_t
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_int8_t
val ppl_Pointset_Powerset_BD_Shape_int8_t_swap :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_space_dimension :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_affine_dimension :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_relation_with_constraint :
  pointset_powerset_bd_shape_int8_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int8_t_relation_with_generator :
  pointset_powerset_bd_shape_int8_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int8_t_relation_with_congruence :
  pointset_powerset_bd_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_empty :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_universe :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_bounded :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_contains_integer_point :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_topologically_closed :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_discrete :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_topological_closure_assign :
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_pairwise_reduce :
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_omega_reduce :
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounds_from_above :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounds_from_below :
```

```
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_maximize :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_minimize :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_maximize_with_point :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int8_t_minimize_with_point :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int8_t_contains_Pointset_Powerset_BD_Shape_int8_t
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_strictly_contains_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_is_disjoint_from_Pointset_Powerset_BD_Shape
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_geometrically_covers_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_geometrically_equals_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_equals_Pointset_Powerset_BD_Shape_int8_t :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_OK :
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_constraint :
  pointset_powerset_bd_shape_int8_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_congruence :
  pointset_powerset_bd_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_constraints :
  pointset_powerset_bd_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_congruences :
  pointset_powerset_bd_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_constraint :
  pointset_powerset_bd_shape_int8_t ->
```

```
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_congruence :
  pointset_powerset_bd_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_constraints :
  pointset_powerset_bd_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_refine_with_congruences :
  pointset_powerset_bd_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_intersection_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_upper_bound_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_difference_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_concatenate_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_time_elapse_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_constrains :
  pointset_powerset_bd_shape_int8_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_affine_image :
  pointset_powerset_bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_affine_preimage :
  pointset_powerset_bd_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_affine_image :
  pointset_powerset_bd_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int8_t ->
  int ->
```

```
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_image :
  pointset_powerset_bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_expand_space_dimension :
  pointset_powerset_bd_shape_int8_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_map_space_dimensions :
  pointset_powerset_bd_shape_int8_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int8_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int8_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_ascii_dump :
  pointset_powerset_bd_shape_int8_t -> string
val ppl_Pointset_Powerset_BD_Shape_int8_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int8_t -> int
val ppl_Pointset_Powerset_BD_Shape_int8_t_size :
  pointset_powerset_bd_shape_int8_t -> int
type pointset_powerset_bd_shape_int8_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int8_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int8_t_iterator ->
  pointset_powerset_bd_shape_int8_t_iterator
```

```
val ppl_Pointset_Powerset_BD_Shape_int8_t_begin_iterator :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int8_t_end_iterator :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int8_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int8_t_iterator ->
  pointset_powerset_bd_shape_int8_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int8_t_increment_iterator :
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_decrement_iterator :
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_get_disjunct :
  pointset_powerset_bd_shape_int8_t_iterator ->
  bd_shape_int8_t
val ppl_Pointset_Powerset_BD_Shape_int8_t_add_disjunct :
  pointset_powerset_bd_shape_int8_t ->
  bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_disjunct :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_drop_disjuncts :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t_iterator ->
  pointset_powerset_bd_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int8_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int8_t ->
  pointset_powerset_bd_shape_int8_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_Pointset_Powerset_BD_Shape_int16_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_BD_Shape_int16_t :
  bd_shape_int16_t -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_Pointset_Powerset_BD_Shape_int16_
  pointset_powerset_bd_shape_int16_t ->
  complexity_class -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_BD_Shape_int16_t_with_complexity
```

```
  bd_shape_int16_t ->
  complexity_class -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int16_t
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_int16_t
val ppl_Pointset_Powerset_BD_Shape_int16_t_swap :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_space_dimension :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_affine_dimension :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_relation_with_constraint :
  pointset_powerset_bd_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int16_t_relation_with_generator :
  pointset_powerset_bd_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int16_t_relation_with_congruence :
  pointset_powerset_bd_shape_int16_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_empty :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_universe :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_bounded :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_contains_integer_point :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_topologically_closed :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_discrete :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_topological_closure_assign :
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_pairwise_reduce :
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_omega_reduce :
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounds_from_above :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounds_from_below :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_maximize :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
```

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val ppl_Pointset_Powerset_BD_Shape_int16_t_minimize :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_maximize_with_point :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int16_t_minimize_with_point :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int16_t_contains_Pointset_Powerset_BD_Shape_int16_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_strictly_contains_Pointset_Powerset_BD_Sha
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_is_disjoint_from_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_geometrically_covers_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_geometrically_equals_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_equals_Pointset_Powerset_BD_Shape_int16_t
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_OK :
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_constraint :
  pointset_powerset_bd_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_congruence :
  pointset_powerset_bd_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_constraints :
  pointset_powerset_bd_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_congruences :
  pointset_powerset_bd_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_constraint :
  pointset_powerset_bd_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_congruence :
  pointset_powerset_bd_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_constraints :
```

```
  pointset_powerset_bd_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_refine_with_congruences :
  pointset_powerset_bd_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_intersection_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_upper_bound_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_difference_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_concatenate_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_time_elapse_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_constrains :
  pointset_powerset_bd_shape_int16_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_affine_image :
  pointset_powerset_bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_affine_preimage :
  pointset_powerset_bd_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounded_affine_image :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_image :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_expand_space_dimension :
  pointset_powerset_bd_shape_int16_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_map_space_dimensions :
  pointset_powerset_bd_shape_int16_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int16_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int16_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_ascii_dump :
  pointset_powerset_bd_shape_int16_t -> string
val ppl_Pointset_Powerset_BD_Shape_int16_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int16_t -> int
val ppl_Pointset_Powerset_BD_Shape_int16_t_size :
  pointset_powerset_bd_shape_int16_t -> int
type pointset_powerset_bd_shape_int16_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int16_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int16_t_iterator ->
  pointset_powerset_bd_shape_int16_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int16_t_begin_iterator :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int16_t_end_iterator :
  pointset_powerset_bd_shape_int16_t ->
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  pointset_powerset_bd_shape_int16_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int16_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int16_t_iterator ->
  pointset_powerset_bd_shape_int16_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int16_t_increment_iterator :
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_decrement_iterator :
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_get_disjunct :
  pointset_powerset_bd_shape_int16_t_iterator ->
  bd_shape_int16_t
val ppl_Pointset_Powerset_BD_Shape_int16_t_add_disjunct :
  pointset_powerset_bd_shape_int16_t ->
  bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_disjunct :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_drop_disjuncts :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t_iterator ->
  pointset_powerset_bd_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int16_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int16_t ->
  pointset_powerset_bd_shape_int16_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_Pointset_Powerset_BD_Shape_int32_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_BD_Shape_int32_t :
  bd_shape_int32_t -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_Pointset_Powerset_BD_Shape_int32_
  pointset_powerset_bd_shape_int32_t ->
  complexity_class -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_BD_Shape_int32_t_with_complexity
  bd_shape_int32_t ->
  complexity_class -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int32_t
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_from_congruences :
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  congruence_system -> pointset_powerset_bd_shape_int32_t
val ppl_Pointset_Powerset_BD_Shape_int32_t_swap :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_space_dimension :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_affine_dimension :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_constraint :
  pointset_powerset_bd_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_generator :
  pointset_powerset_bd_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int32_t_relation_with_congruence :
  pointset_powerset_bd_shape_int32_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_empty :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_universe :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_bounded :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_contains_integer_point :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_topologically_closed :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_discrete :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_topological_closure_assign :
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_pairwise_reduce :
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_omega_reduce :
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounds_from_above :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounds_from_below :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_maximize :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_minimize :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_maximize_with_point :
  pointset_powerset_bd_shape_int32_t ->
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  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int32_t_minimize_with_point :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int32_t_contains_Pointset_Powerset_BD_Shape_int32_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_strictly_contains_Pointset_Powerset_BD_Sha
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_is_disjoint_from_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_geometrically_covers_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_geometrically_equals_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_equals_Pointset_Powerset_BD_Shape_int32_t
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_OK :
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_constraint :
  pointset_powerset_bd_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_congruence :
  pointset_powerset_bd_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_constraints :
  pointset_powerset_bd_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_congruences :
  pointset_powerset_bd_shape_int32_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_constraint :
  pointset_powerset_bd_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_congruence :
  pointset_powerset_bd_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_constraints :
  pointset_powerset_bd_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_refine_with_congruences :
  pointset_powerset_bd_shape_int32_t ->
  congruence_system -> unit
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val ppl_Pointset_Powerset_BD_Shape_int32_t_intersection_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_upper_bound_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_difference_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_concatenate_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_time_elapse_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_constrains :
  pointset_powerset_bd_shape_int32_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_affine_image :
  pointset_powerset_bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_affine_preimage :
  pointset_powerset_bd_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounded_affine_image :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_image :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_image_lhs_rhs :
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  pointset_powerset_bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_expand_space_dimension :
  pointset_powerset_bd_shape_int32_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_map_space_dimensions :
  pointset_powerset_bd_shape_int32_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int32_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int32_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_ascii_dump :
  pointset_powerset_bd_shape_int32_t -> string
val ppl_Pointset_Powerset_BD_Shape_int32_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int32_t -> int
val ppl_Pointset_Powerset_BD_Shape_int32_t_size :
  pointset_powerset_bd_shape_int32_t -> int
type pointset_powerset_bd_shape_int32_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int32_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int32_t_iterator ->
  pointset_powerset_bd_shape_int32_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int32_t_begin_iterator :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int32_t_end_iterator :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int32_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int32_t_iterator ->
  pointset_powerset_bd_shape_int32_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int32_t_increment_iterator :
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  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_decrement_iterator :
  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_get_disjunct :
  pointset_powerset_bd_shape_int32_t_iterator ->
  bd_shape_int32_t
val ppl_Pointset_Powerset_BD_Shape_int32_t_add_disjunct :
  pointset_powerset_bd_shape_int32_t ->
  bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_disjunct :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_drop_disjuncts :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t_iterator ->
  pointset_powerset_bd_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int32_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int32_t ->
  pointset_powerset_bd_shape_int32_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_Pointset_Powerset_BD_Shape_int64_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_BD_Shape_int64_t :
  bd_shape_int64_t -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_Pointset_Powerset_BD_Shape_int64_
  pointset_powerset_bd_shape_int64_t ->
  complexity_class -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_BD_Shape_int64_t_with_complexity
  bd_shape_int64_t ->
  complexity_class -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_int64_t
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_int64_t
val ppl_Pointset_Powerset_BD_Shape_int64_t_swap :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_space_dimension :
```

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  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_affine_dimension :
  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_relation_with_constraint :
  pointset_powerset_bd_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int64_t_relation_with_generator :
  pointset_powerset_bd_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_int64_t_relation_with_congruence :
  pointset_powerset_bd_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_empty :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_universe :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_bounded :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_contains_integer_point :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_topologically_closed :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_discrete :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_topological_closure_assign :
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_pairwise_reduce :
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_omega_reduce :
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounds_from_above :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounds_from_below :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_maximize :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_minimize :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_maximize_with_point :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int64_t_minimize_with_point :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression ->
```

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  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_int64_t_contains_Pointset_Powerset_BD_Shape_int64_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_strictly_contains_Pointset_Powerset_BD_Sha
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_is_disjoint_from_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_geometrically_covers_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_geometrically_equals_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_equals_Pointset_Powerset_BD_Shape_int64_t
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_OK :
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_constraint :
  pointset_powerset_bd_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_congruence :
  pointset_powerset_bd_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_constraints :
  pointset_powerset_bd_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_congruences :
  pointset_powerset_bd_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_constraint :
  pointset_powerset_bd_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_congruence :
  pointset_powerset_bd_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_constraints :
  pointset_powerset_bd_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_refine_with_congruences :
  pointset_powerset_bd_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_intersection_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_upper_bound_assign :
  pointset_powerset_bd_shape_int64_t ->
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  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_difference_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_concatenate_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_time_elapse_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_simplify_using_context_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_constrains :
  pointset_powerset_bd_shape_int64_t -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_unconstrain_space_dimension :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_affine_image :
  pointset_powerset_bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_affine_preimage :
  pointset_powerset_bd_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounded_affine_image :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_bounded_affine_preimage :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_image :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_preimage :
  pointset_powerset_bd_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_int64_t ->
```

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  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_remove_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_expand_space_dimension :
  pointset_powerset_bd_shape_int64_t -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_fold_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_map_space_dimensions :
  pointset_powerset_bd_shape_int64_t -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_some_non_integer_points :
  pointset_powerset_bd_shape_int64_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_int64_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_ascii_dump :
  pointset_powerset_bd_shape_int64_t -> string
val ppl_Pointset_Powerset_BD_Shape_int64_t_external_memory_in_bytes :
  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_total_memory_in_bytes :
  pointset_powerset_bd_shape_int64_t -> int
val ppl_Pointset_Powerset_BD_Shape_int64_t_size :
  pointset_powerset_bd_shape_int64_t -> int
type pointset_powerset_bd_shape_int64_t_iterator
val ppl_new_Pointset_Powerset_BD_Shape_int64_t_iterator_from_iterator :
  pointset_powerset_bd_shape_int64_t_iterator ->
  pointset_powerset_bd_shape_int64_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int64_t_begin_iterator :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int64_t_end_iterator :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator
val ppl_Pointset_Powerset_BD_Shape_int64_t_iterator_equals_iterator :
  pointset_powerset_bd_shape_int64_t_iterator ->
  pointset_powerset_bd_shape_int64_t_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_int64_t_increment_iterator :
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_decrement_iterator :
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_get_disjunct :
  pointset_powerset_bd_shape_int64_t_iterator ->
```

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  bd_shape_int64_t
val ppl_Pointset_Powerset_BD_Shape_int64_t_add_disjunct :
  pointset_powerset_bd_shape_int64_t ->
  bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_disjunct :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_drop_disjuncts :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t_iterator ->
  pointset_powerset_bd_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_int64_t_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_int64_t ->
  pointset_powerset_bd_shape_int64_t -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Pointset_Powerset_BD_Shape_mpq_
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_Pointset_Powerset_BD_Shape_mpq_
  pointset_powerset_bd_shape_mpq_class ->
  complexity_class -> pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_BD_Shape_mpq_class_with_complex
  bd_shape_mpq_class ->
  complexity_class -> pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_mpq_class
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_mpq_class
val ppl_Pointset_Powerset_BD_Shape_mpq_class_swap :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_space_dimension :
  pointset_powerset_bd_shape_mpq_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_dimension :
  pointset_powerset_bd_shape_mpq_class -> int
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_constraint :
  pointset_powerset_bd_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_generator :
  pointset_powerset_bd_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_mpq_class_relation_with_congruence :
  pointset_powerset_bd_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_empty :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_universe :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_bounded :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_contains_integer_point :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_topologically_closed :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_discrete :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_topological_closure_assign :
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_pairwise_reduce :
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_omega_reduce :
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounds_from_above :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounds_from_below :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_maximize :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_minimize :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_maximize_with_point :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_minimize_with_point :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_contains_Pointset_Powerset_BD_Shape_mpq_
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
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val ppl_Pointset_Powerset_BD_Shape_mpq_class_strictly_contains_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_is_disjoint_from_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_geometrically_covers_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_geometrically_equals_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_equals_Pointset_Powerset_BD_Shape_mpq_cl
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_OK :
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_constraint :
  pointset_powerset_bd_shape_mpq_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_congruence :
  pointset_powerset_bd_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_constraints :
  pointset_powerset_bd_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_congruences :
  pointset_powerset_bd_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_constraint :
  pointset_powerset_bd_shape_mpq_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_congruence :
  pointset_powerset_bd_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_constraints :
  pointset_powerset_bd_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_refine_with_congruences :
  pointset_powerset_bd_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_intersection_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_upper_bound_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_difference_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_concatenate_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_time_elapse_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_simplify_using_context_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_constrains :
  pointset_powerset_bd_shape_mpq_class -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_unconstrain_space_dimension :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_image :
  pointset_powerset_bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_affine_preimage :
  pointset_powerset_bd_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_affine_image :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_bounded_affine_preimage :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_image :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_preimage :
  pointset_powerset_bd_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_remove_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_expand_space_dimension :
  pointset_powerset_bd_shape_mpq_class -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_fold_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_map_space_dimensions :
  pointset_powerset_bd_shape_mpq_class -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_some_non_integer_points :
  pointset_powerset_bd_shape_mpq_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_mpq_class ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_ascii_dump :
  pointset_powerset_bd_shape_mpq_class -> string
val ppl_Pointset_Powerset_BD_Shape_mpq_class_external_memory_in_bytes :
  pointset_powerset_bd_shape_mpq_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpq_class_total_memory_in_bytes :
  pointset_powerset_bd_shape_mpq_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpq_class_size :
  pointset_powerset_bd_shape_mpq_class -> int
type pointset_powerset_bd_shape_mpq_class_iterator
val ppl_new_Pointset_Powerset_BD_Shape_mpq_class_iterator_from_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator ->
  pointset_powerset_bd_shape_mpq_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_begin_iterator :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_end_iterator :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpq_class_iterator_equals_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator ->
  pointset_powerset_bd_shape_mpq_class_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_mpq_class_increment_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_decrement_iterator :
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_get_disjunct :
  pointset_powerset_bd_shape_mpq_class_iterator ->
  bd_shape_mpq_class
val ppl_Pointset_Powerset_BD_Shape_mpq_class_add_disjunct :
  pointset_powerset_bd_shape_mpq_class ->
  bd_shape_mpq_class -> unit
```

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val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_disjunct :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_drop_disjuncts :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class_iterator ->
  pointset_powerset_bd_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpq_class_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_mpq_class ->
  pointset_powerset_bd_shape_mpq_class -> int -> unit
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_BD_Shape_mpz_
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_Pointset_Powerset_BD_Shape_mpz_
  pointset_powerset_bd_shape_mpz_class ->
  complexity_class -> pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_BD_Shape_mpz_class_with_complex
  bd_shape_mpz_class ->
  complexity_class -> pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_mpz_class
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_mpz_class
val ppl_Pointset_Powerset_BD_Shape_mpz_class_swap :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_space_dimension :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_dimension :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_constraint :
  pointset_powerset_bd_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_generator :
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  pointset_powerset_bd_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_mpz_class_relation_with_congruence :
  pointset_powerset_bd_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_empty :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_universe :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_bounded :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_contains_integer_point :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_topologically_closed :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_discrete :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_topological_closure_assign :
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_pairwise_reduce :
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_omega_reduce :
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounds_from_above :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounds_from_below :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_maximize :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_minimize :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_maximize_with_point :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_minimize_with_point :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_contains_Pointset_Powerset_BD_Shape_mpz_
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_strictly_contains_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
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val ppl_Pointset_Powerset_BD_Shape_mpz_class_is_disjoint_from_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_covers_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_geometrically_equals_Pointset_Powerset_B
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_equals_Pointset_Powerset_BD_Shape_mpz_cl
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_OK :
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraint :
  pointset_powerset_bd_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_congruence :
  pointset_powerset_bd_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_constraints :
  pointset_powerset_bd_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_congruences :
  pointset_powerset_bd_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_constraint :
  pointset_powerset_bd_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_congruence :
  pointset_powerset_bd_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_constraints :
  pointset_powerset_bd_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_refine_with_congruences :
  pointset_powerset_bd_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_intersection_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_upper_bound_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_difference_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_concatenate_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
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val ppl_Pointset_Powerset_BD_Shape_mpz_class_time_elapse_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_simplify_using_context_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_constrains :
  pointset_powerset_bd_shape_mpz_class -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_unconstrain_space_dimension :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_image :
  pointset_powerset_bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_affine_preimage :
  pointset_powerset_bd_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounded_affine_image :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_bounded_affine_preimage :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage :
  pointset_powerset_bd_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_remove_space_dimensions :
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  pointset_powerset_bd_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_expand_space_dimension :
  pointset_powerset_bd_shape_mpz_class -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_fold_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_map_space_dimensions :
  pointset_powerset_bd_shape_mpz_class -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_some_non_integer_points :
  pointset_powerset_bd_shape_mpz_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_ascii_dump :
  pointset_powerset_bd_shape_mpz_class -> string
val ppl_Pointset_Powerset_BD_Shape_mpz_class_external_memory_in_bytes :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_total_memory_in_bytes :
  pointset_powerset_bd_shape_mpz_class -> int
val ppl_Pointset_Powerset_BD_Shape_mpz_class_size :
  pointset_powerset_bd_shape_mpz_class -> int
type pointset_powerset_bd_shape_mpz_class_iterator
val ppl_new_Pointset_Powerset_BD_Shape_mpz_class_iterator_from_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator ->
  pointset_powerset_bd_shape_mpz_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_begin_iterator :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_end_iterator :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator
val ppl_Pointset_Powerset_BD_Shape_mpz_class_iterator_equals_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator ->
  pointset_powerset_bd_shape_mpz_class_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_mpz_class_increment_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_decrement_iterator :
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_get_disjunct :
  pointset_powerset_bd_shape_mpz_class_iterator ->
  bd_shape_mpz_class
val ppl_Pointset_Powerset_BD_Shape_mpz_class_add_disjunct :
  pointset_powerset_bd_shape_mpz_class ->
  bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_disjunct :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
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val ppl_Pointset_Powerset_BD_Shape_mpz_class_drop_disjuncts :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class_iterator ->
  pointset_powerset_bd_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_mpz_class_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_mpz_class ->
  pointset_powerset_bd_shape_mpz_class -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_int8_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_Octagonal_Shape_int8_t_with
  octagonal_shape_int8_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int8_t
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_swap :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_space_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_affine_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_constraint -> poly_con_relation list
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_empty :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_universe :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_bounded :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_contains_integer_point :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_discrete :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_omega_reduce :
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_maximize :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_minimize :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_contains_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_strictly_contains_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
```

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val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_is_disjoint_from_Pointset_Powerset_O
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_geometrically_covers_Pointset_Powers
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_geometrically_equals_Pointset_Powers
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_equals_Pointset_Powerset_Octagonal_S
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_OK :
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_constraint :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_congruence :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_constraints :
  pointset_powerset_octagonal_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_congruences :
  pointset_powerset_octagonal_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int8_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int8_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_intersection_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_difference_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_constrains :
  pointset_powerset_octagonal_shape_int8_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_affine_image :
  pointset_powerset_octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_affine_preimage :
  pointset_powerset_octagonal_shape_int8_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int8_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int8_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_remove_space_dimensions :
```

```
  pointset_powerset_octagonal_shape_int8_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_expand_space_dimension :
  pointset_powerset_octagonal_shape_int8_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t -> int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int8_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int8_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int8_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_ascii_dump :
  pointset_powerset_octagonal_shape_int8_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int8_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_size :
  pointset_powerset_octagonal_shape_int8_t -> int
type pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int8_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_begin_iterator :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_end_iterator :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  pointset_powerset_octagonal_shape_int8_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_increment_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_get_disjunct :
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  octagonal_shape_int8_t
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_add_disjunct :
  pointset_powerset_octagonal_shape_int8_t ->
  octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int8_t ->
```

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  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t_iterator ->
  pointset_powerset_octagonal_shape_int8_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int8_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int8_t ->
  pointset_powerset_octagonal_shape_int8_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int16_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_Octagonal_Shape_int16_t_wi
  octagonal_shape_int16_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int16_t
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_swap :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_space_dimension :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_affine_dimension :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int16_t ->
```

```
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_empty :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_universe :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_bounded :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_contains_integer_point :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_discrete :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_omega_reduce :
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_maximize :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_minimize :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_contains_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_strictly_contains_Pointset_Powerset
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_is_disjoint_from_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_geometrically_covers_Pointset_Power
```

```
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_geometrically_equals_Pointset_Power
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_equals_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_OK :
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_constraint :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_congruence :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_constraints :
  pointset_powerset_octagonal_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_congruences :
  pointset_powerset_octagonal_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int16_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int16_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_intersection_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_difference_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_upper_bound_assign_if_exact :
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  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_constrains :
  pointset_powerset_octagonal_shape_int16_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_affine_image :
  pointset_powerset_octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_affine_preimage :
  pointset_powerset_octagonal_shape_int16_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int16_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int16_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_remove_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_expand_space_dimension :
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  pointset_powerset_octagonal_shape_int16_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int16_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int16_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int16_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_ascii_dump :
  pointset_powerset_octagonal_shape_int16_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int16_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_size :
  pointset_powerset_octagonal_shape_int16_t -> int
type pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int16_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator ->
  pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_begin_iterator :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_end_iterator :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator ->
  pointset_powerset_octagonal_shape_int16_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_increment_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_get_disjunct :
  pointset_powerset_octagonal_shape_int16_t_iterator ->
  octagonal_shape_int16_t
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_add_disjunct :
  pointset_powerset_octagonal_shape_int16_t ->
  octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int16_t ->
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  pointset_powerset_octagonal_shape_int16_t_iterator ->
  pointset_powerset_octagonal_shape_int16_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int16_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int16_t ->
  pointset_powerset_octagonal_shape_int16_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int32_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_Octagonal_Shape_int32_t_wi
  octagonal_shape_int32_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int32_t
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_swap :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_space_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_affine_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_empty :
  pointset_powerset_octagonal_shape_int32_t -> bool
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val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_universe :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_bounded :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_contains_integer_point :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_discrete :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_omega_reduce :
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_maximize :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_minimize :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_contains_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_strictly_contains_Pointset_Powerset
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_is_disjoint_from_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_geometrically_covers_Pointset_Power
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_geometrically_equals_Pointset_Power
  pointset_powerset_octagonal_shape_int32_t ->
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  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_equals_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_OK :
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_constraint :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_congruence :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_constraints :
  pointset_powerset_octagonal_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_congruences :
  pointset_powerset_octagonal_shape_int32_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int32_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int32_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_intersection_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_difference_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int32_t ->
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  pointset_powerset_octagonal_shape_int32_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_constrains :
  pointset_powerset_octagonal_shape_int32_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_affine_image :
  pointset_powerset_octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_affine_preimage :
  pointset_powerset_octagonal_shape_int32_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int32_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int32_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_remove_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_expand_space_dimension :
  pointset_powerset_octagonal_shape_int32_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t ->
  int list -> int -> unit
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val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int32_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int32_t ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int32_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_ascii_dump :
  pointset_powerset_octagonal_shape_int32_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int32_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_size :
  pointset_powerset_octagonal_shape_int32_t -> int
type pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int32_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_begin_iterator :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_end_iterator :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  pointset_powerset_octagonal_shape_int32_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_increment_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_get_disjunct :
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  octagonal_shape_int32_t
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_add_disjunct :
  pointset_powerset_octagonal_shape_int32_t ->
  octagonal_shape_int32_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t_iterator ->
  pointset_powerset_octagonal_shape_int32_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> unit
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val ppl_Pointset_Powerset_Octagonal_Shape_int32_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int32_t ->
  pointset_powerset_octagonal_shape_int32_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int64_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_Octagonal_Shape_int64_t_wi
  octagonal_shape_int64_t ->
  complexity_class ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_int64_t
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_swap :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_space_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_affine_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_relation_with_constraint :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_relation_with_generator :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_relation_with_congruence :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_empty :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_universe :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_bounded :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_contains_integer_point :
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  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_topologically_closed :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_discrete :
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_topological_closure_assign :
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_pairwise_reduce :
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_omega_reduce :
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounds_from_above :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounds_from_below :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_maximize :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_minimize :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_maximize_with_point :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_minimize_with_point :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_contains_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_strictly_contains_Pointset_Powerset
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_is_disjoint_from_Pointset_Powerset_
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_geometrically_covers_Pointset_Power
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_geometrically_equals_Pointset_Power
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_equals_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_OK :
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  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraint :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_congruence :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_constraints :
  pointset_powerset_octagonal_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_congruences :
  pointset_powerset_octagonal_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_constraint :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_congruence :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_constraints :
  pointset_powerset_octagonal_shape_int64_t ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_refine_with_congruences :
  pointset_powerset_octagonal_shape_int64_t ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_intersection_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upper_bound_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_difference_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_concatenate_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_time_elapse_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_constrains :
  pointset_powerset_octagonal_shape_int64_t -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
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val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_affine_image :
  pointset_powerset_octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_affine_preimage :
  pointset_powerset_octagonal_shape_int64_t ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounded_affine_image :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_image :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_int64_t ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_int64_t ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_expand_space_dimension :
  pointset_powerset_octagonal_shape_int64_t -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_fold_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_map_space_dimensions :
  pointset_powerset_octagonal_shape_int64_t ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_int64_t ->
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  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_int64_t ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_ascii_dump :
  pointset_powerset_octagonal_shape_int64_t -> string
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_int64_t -> int
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_size :
  pointset_powerset_octagonal_shape_int64_t -> int
type pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_int64_t_iterator_from_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_begin_iterator :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_end_iterator :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  pointset_powerset_octagonal_shape_int64_t_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_increment_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_decrement_iterator :
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_get_disjunct :
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  octagonal_shape_int64_t
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_add_disjunct :
  pointset_powerset_octagonal_shape_int64_t ->
  octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_disjunct :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_drop_disjuncts :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t_iterator ->
  pointset_powerset_octagonal_shape_int64_t_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_int64_t_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_int64_t ->
  pointset_powerset_octagonal_shape_int64_t -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_space_dimension :
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  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_clas
  octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpq_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_Octagonal_Shape_mpq_clas
  octagonal_shape_mpq_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_mpq_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_swap :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_space_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_affine_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_relation_with_constraint :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_relation_with_generator :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_relation_with_congruence :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_empty :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_universe :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_bounded :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_contains_integer_point :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_topologically_closed :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_discrete :
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  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_topological_closure_assign :
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_pairwise_reduce :
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_omega_reduce :
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounds_from_above :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounds_from_below :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_maximize :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_minimize :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_maximize_with_point :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_minimize_with_point :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_contains_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_strictly_contains_Pointset_Powers
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_is_disjoint_from_Pointset_Powerse
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_geometrically_covers_Pointset_Pow
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_geometrically_equals_Pointset_Pow
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_equals_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_OK :
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_constraint :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_constraint -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_congruence :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_constraints :
  pointset_powerset_octagonal_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_congruences :
  pointset_powerset_octagonal_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_constraint :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_congruence :
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_constraints :
  pointset_powerset_octagonal_shape_mpq_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_refine_with_congruences :
  pointset_powerset_octagonal_shape_mpq_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_intersection_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_upper_bound_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_difference_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_concatenate_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_time_elapse_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_constrains :
  pointset_powerset_octagonal_shape_mpq_class -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_affine_image :
  pointset_powerset_octagonal_shape_mpq_class ->
```

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  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_affine_preimage :
  pointset_powerset_octagonal_shape_mpq_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounded_affine_image :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_image :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_mpq_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_image_lhs_rhs
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_generalized_affine_preimage_lhs_r
  pointset_powerset_octagonal_shape_mpq_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_space_dimensions_and_project
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_remove_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_expand_space_dimension :
  pointset_powerset_octagonal_shape_mpq_class -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_fold_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_map_space_dimensions :
  pointset_powerset_octagonal_shape_mpq_class ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_mpq_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_mpq_class ->
  int list -> complexity_class -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_ascii_dump :
  pointset_powerset_octagonal_shape_mpq_class -> string
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpq_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_size :
  pointset_powerset_octagonal_shape_mpq_class -> int
type pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpq_class_iterator_from_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_begin_iterator :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_end_iterator :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  pointset_powerset_octagonal_shape_mpq_class_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_increment_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_decrement_iterator :
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_get_disjunct :
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  octagonal_shape_mpq_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_add_disjunct :
  pointset_powerset_octagonal_shape_mpq_class ->
  octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_disjunct :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_drop_disjuncts :
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class_iterator ->
  pointset_powerset_octagonal_shape_mpq_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_BHZ03_H79_BHMZ05_widening_assign
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpq_class_BGP99_BHMZ05_extrapolation_assign
  pointset_powerset_octagonal_shape_mpq_class ->
  pointset_powerset_octagonal_shape_mpq_class -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpz_class ->
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  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_clas
  octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpz_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_Octagonal_Shape_mpz_clas
  octagonal_shape_mpz_class ->
  complexity_class ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_mpz_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_swap :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_space_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_affine_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_relation_with_constraint :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_relation_with_generator :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_relation_with_congruence :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_empty :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_universe :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_bounded :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_contains_integer_point :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_topologically_closed :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_discrete :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_topological_closure_assign :
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_pairwise_reduce :
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  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_omega_reduce :
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounds_from_above :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounds_from_below :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_maximize :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_minimize :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_maximize_with_point :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_minimize_with_point :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_contains_Pointset_Powerset_Octago
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_strictly_contains_Pointset_Powers
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_is_disjoint_from_Pointset_Powerse
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_geometrically_covers_Pointset_Pow
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_geometrically_equals_Pointset_Pow
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_equals_Pointset_Powerset_Octagona
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_OK :
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_constraint :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_congruence :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_constraints :
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  pointset_powerset_octagonal_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_congruences :
  pointset_powerset_octagonal_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_constraint :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_congruence :
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_constraints :
  pointset_powerset_octagonal_shape_mpz_class ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_refine_with_congruences :
  pointset_powerset_octagonal_shape_mpz_class ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_intersection_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_upper_bound_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_difference_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_concatenate_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_time_elapse_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_constrains :
  pointset_powerset_octagonal_shape_mpz_class -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_affine_image :
  pointset_powerset_octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_affine_preimage :
  pointset_powerset_octagonal_shape_mpz_class ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounded_affine_image :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_image :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_mpz_class ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_image_lhs_rhs
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_generalized_affine_preimage_lhs_r
  pointset_powerset_octagonal_shape_mpz_class ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_space_dimensions_and_project
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_remove_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_expand_space_dimension :
  pointset_powerset_octagonal_shape_mpz_class -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_fold_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_map_space_dimensions :
  pointset_powerset_octagonal_shape_mpz_class ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_mpz_class ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_mpz_class ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_ascii_dump :
  pointset_powerset_octagonal_shape_mpz_class -> string
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpz_class -> int
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val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_mpz_class -> int
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_size :
  pointset_powerset_octagonal_shape_mpz_class -> int
type pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_mpz_class_iterator_from_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_begin_iterator :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_end_iterator :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  pointset_powerset_octagonal_shape_mpz_class_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_increment_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_decrement_iterator :
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_get_disjunct :
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  octagonal_shape_mpz_class
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_add_disjunct :
  pointset_powerset_octagonal_shape_mpz_class ->
  octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_disjunct :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_drop_disjuncts :
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class_iterator ->
  pointset_powerset_octagonal_shape_mpz_class_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_BHZ03_H79_BHMZ05_widening_assign
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_mpz_class_BGP99_BHMZ05_extrapolation_assign
  pointset_powerset_octagonal_shape_mpz_class ->
  pointset_powerset_octagonal_shape_mpz_class -> int -> unit
val ppl_new_Pointset_Powerset_C_Polyhedron_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_Pointset_Powerset_C_Polyhedron :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_C_Polyhedron :
  polyhedron -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_Pointset_Powerset_C_Polyhedron_with_c
  pointset_powerset_c_polyhedron ->
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  complexity_class -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_constraints :
  constraint_system -> pointset_powerset_c_polyhedron
val ppl_new_Pointset_Powerset_C_Polyhedron_from_congruences :
  congruence_system -> pointset_powerset_c_polyhedron
val ppl_Pointset_Powerset_C_Polyhedron_swap :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_space_dimension :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_affine_dimension :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_relation_with_constraint :
  pointset_powerset_c_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_C_Polyhedron_relation_with_generator :
  pointset_powerset_c_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_C_Polyhedron_relation_with_congruence :
  pointset_powerset_c_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_C_Polyhedron_is_empty :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_universe :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_bounded :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_contains_integer_point :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_topologically_closed :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_discrete :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_topological_closure_assign :
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce :
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_omega_reduce :
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_bounds_from_above :
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_C_Polyhedron_bounds_from_below :
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_C_Polyhedron_maximize :
```

```
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_C_Polyhedron_minimize :
  pointset_powerset_c_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_C_Polyhedron_maximize_with_point :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_C_Polyhedron_minimize_with_point :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_C_Polyhedron_contains_Pointset_Powerset_C_Polyhedron :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_strictly_contains_Pointset_Powerset_C_Polyhedr
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_is_disjoint_from_Pointset_Powerset_C_Polyhedro
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_geometrically_covers_Pointset_Powerset_C_Polyh
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_geometrically_equals_Pointset_Powerset_C_Polyh
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_equals_Pointset_Powerset_C_Polyhedron :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_OK :
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_add_constraint :
  pointset_powerset_c_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_congruence :
  pointset_powerset_c_polyhedron ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_constraints :
  pointset_powerset_c_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_congruences :
  pointset_powerset_c_polyhedron ->
  congruence_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_constraint :
  pointset_powerset_c_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_congruence :
  pointset_powerset_c_polyhedron ->
```

```
  linear_congruence -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_constraints :
  pointset_powerset_c_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_refine_with_congruences :
  pointset_powerset_c_polyhedron ->
  congruence_system -> unit
val ppl_Pointset_Powerset_C_Polyhedron_intersection_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_difference_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_concatenate_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_time_elapse_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_upper_bound_assign_if_exact :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_simplify_using_context_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> bool
val ppl_Pointset_Powerset_C_Polyhedron_constrains :
  pointset_powerset_c_polyhedron -> int -> bool
val ppl_Pointset_Powerset_C_Polyhedron_unconstrain_space_dimension :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_unconstrain_space_dimensions :
  pointset_powerset_c_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_C_Polyhedron_affine_image :
  pointset_powerset_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_affine_preimage :
  pointset_powerset_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_bounded_affine_image :
  pointset_powerset_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_bounded_affine_preimage :
  pointset_powerset_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image :
  pointset_powerset_c_polyhedron ->
```

```
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage :
  pointset_powerset_c_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_image_lhs_rhs :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_C_Polyhedron_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_embed :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_add_space_dimensions_and_project :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_remove_space_dimensions :
  pointset_powerset_c_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_C_Polyhedron_remove_higher_space_dimensions :
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_expand_space_dimension :
  pointset_powerset_c_polyhedron -> int -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_fold_space_dimensions :
  pointset_powerset_c_polyhedron -> int list -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_map_space_dimensions :
  pointset_powerset_c_polyhedron -> (int * int) list -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_some_non_integer_points :
  pointset_powerset_c_polyhedron ->
  complexity_class -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_some_non_integer_points_2 :
  pointset_powerset_c_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_C_Polyhedron_ascii_dump :
  pointset_powerset_c_polyhedron -> string
val ppl_Pointset_Powerset_C_Polyhedron_external_memory_in_bytes :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_total_memory_in_bytes :
  pointset_powerset_c_polyhedron -> int
val ppl_Pointset_Powerset_C_Polyhedron_size :
  pointset_powerset_c_polyhedron -> int
type pointset_powerset_c_polyhedron_iterator
val ppl_new_Pointset_Powerset_C_Polyhedron_iterator_from_iterator :
  pointset_powerset_c_polyhedron_iterator ->
  pointset_powerset_c_polyhedron_iterator
val ppl_Pointset_Powerset_C_Polyhedron_begin_iterator :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator
```

```
val ppl_Pointset_Powerset_C_Polyhedron_end_iterator :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator
val ppl_Pointset_Powerset_C_Polyhedron_iterator_equals_iterator :
  pointset_powerset_c_polyhedron_iterator ->
  pointset_powerset_c_polyhedron_iterator -> bool
val ppl_Pointset_Powerset_C_Polyhedron_increment_iterator :
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_decrement_iterator :
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_get_disjunct :
  pointset_powerset_c_polyhedron_iterator -> polyhedron
val ppl_Pointset_Powerset_C_Polyhedron_add_disjunct :
  pointset_powerset_c_polyhedron -> polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron_iterator ->
  pointset_powerset_c_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BHZ03_BHRZ03_BHRZ03_widening_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BHZ03_H79_H79_widening_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BGP99_BHRZ03_extrapolation_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_Pointset_Powerset_C_Polyhedron_BGP99_H79_extrapolation_assign :
  pointset_powerset_c_polyhedron ->
  pointset_powerset_c_polyhedron -> int -> unit
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_Pointset_Powerset_NNC_Polyhedron :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_NNC_Polyhedron :
  polyhedron -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_Pointset_Powerset_NNC_Polyhedron_wi
  pointset_powerset_nnc_polyhedron ->
  complexity_class -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_constraints :
  constraint_system -> pointset_powerset_nnc_polyhedron
val ppl_new_Pointset_Powerset_NNC_Polyhedron_from_congruences :
```

```
  congruence_system -> pointset_powerset_nnc_polyhedron
val ppl_Pointset_Powerset_NNC_Polyhedron_swap :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_space_dimension :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_affine_dimension :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_relation_with_constraint :
  pointset_powerset_nnc_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_NNC_Polyhedron_relation_with_generator :
  pointset_powerset_nnc_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_NNC_Polyhedron_relation_with_congruence :
  pointset_powerset_nnc_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_NNC_Polyhedron_is_empty :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_universe :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_bounded :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_contains_integer_point :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_topologically_closed :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_discrete :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_topological_closure_assign :
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_pairwise_reduce :
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_omega_reduce :
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_bounds_from_above :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_bounds_from_below :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_maximize :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_NNC_Polyhedron_minimize :
  pointset_powerset_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_NNC_Polyhedron_maximize_with_point :
  pointset_powerset_nnc_polyhedron ->
```

```
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_NNC_Polyhedron_minimize_with_point :
  pointset_powerset_nnc_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_NNC_Polyhedron_contains_Pointset_Powerset_NNC_Polyhedron :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_strictly_contains_Pointset_Powerset_NNC_Poly
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_is_disjoint_from_Pointset_Powerset_NNC_Polyh
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_geometrically_covers_Pointset_Powerset_NNC_P
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_geometrically_equals_Pointset_Powerset_NNC_P
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_equals_Pointset_Powerset_NNC_Polyhedron :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_OK :
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_add_constraint :
  pointset_powerset_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_congruence :
  pointset_powerset_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_constraints :
  pointset_powerset_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_congruences :
  pointset_powerset_nnc_polyhedron ->
  congruence_system -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_constraint :
  pointset_powerset_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_congruence :
  pointset_powerset_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_constraints :
  pointset_powerset_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_refine_with_congruences :
  pointset_powerset_nnc_polyhedron ->
  congruence_system -> unit
```

```
val ppl_Pointset_Powerset_NNC_Polyhedron_intersection_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_upper_bound_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_difference_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_concatenate_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_time_elapse_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_upper_bound_assign_if_exact :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_simplify_using_context_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_constrains :
  pointset_powerset_nnc_polyhedron -> int -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_unconstrain_space_dimension :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_unconstrain_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_affine_image :
  pointset_powerset_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_affine_preimage :
  pointset_powerset_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_bounded_affine_image :
  pointset_powerset_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_bounded_affine_preimage :
  pointset_powerset_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_image :
  pointset_powerset_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_preimage :
  pointset_powerset_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_image_lhs_rhs :
```

```
  pointset_powerset_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_space_dimensions_and_embed :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_add_space_dimensions_and_project :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_remove_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int list -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_remove_higher_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_expand_space_dimension :
  pointset_powerset_nnc_polyhedron -> int -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_fold_space_dimensions :
  pointset_powerset_nnc_polyhedron -> int list -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_map_space_dimensions :
  pointset_powerset_nnc_polyhedron -> (int * int) list -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_some_non_integer_points :
  pointset_powerset_nnc_polyhedron ->
  complexity_class -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_some_non_integer_points_2 :
  pointset_powerset_nnc_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_ascii_dump :
  pointset_powerset_nnc_polyhedron -> string
val ppl_Pointset_Powerset_NNC_Polyhedron_external_memory_in_bytes :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_total_memory_in_bytes :
  pointset_powerset_nnc_polyhedron -> int
val ppl_Pointset_Powerset_NNC_Polyhedron_size :
  pointset_powerset_nnc_polyhedron -> int
type pointset_powerset_nnc_polyhedron_iterator
val ppl_new_Pointset_Powerset_NNC_Polyhedron_iterator_from_iterator :
  pointset_powerset_nnc_polyhedron_iterator ->
  pointset_powerset_nnc_polyhedron_iterator
val ppl_Pointset_Powerset_NNC_Polyhedron_begin_iterator :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator
val ppl_Pointset_Powerset_NNC_Polyhedron_end_iterator :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator
val ppl_Pointset_Powerset_NNC_Polyhedron_iterator_equals_iterator :
  pointset_powerset_nnc_polyhedron_iterator ->
  pointset_powerset_nnc_polyhedron_iterator -> bool
val ppl_Pointset_Powerset_NNC_Polyhedron_increment_iterator :
```

```
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_decrement_iterator :
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_get_disjunct :
  pointset_powerset_nnc_polyhedron_iterator -> polyhedron
val ppl_Pointset_Powerset_NNC_Polyhedron_add_disjunct :
  pointset_powerset_nnc_polyhedron -> polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_disjunct :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_drop_disjuncts :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron_iterator ->
  pointset_powerset_nnc_polyhedron_iterator -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BHZ03_BHRZ03_BHRZ03_widening_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BHZ03_H79_H79_widening_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BGP99_BHRZ03_extrapolation_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_Pointset_Powerset_NNC_Polyhedron_BGP99_H79_extrapolation_assign :
  pointset_powerset_nnc_polyhedron ->
  pointset_powerset_nnc_polyhedron -> int -> unit
val ppl_new_Pointset_Powerset_Grid_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Grid : grid -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Pointset_Powerset_Grid_with_complexity :
  pointset_powerset_grid ->
  complexity_class -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_Grid_with_complexity :
  grid ->
  complexity_class -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_constraints :
  constraint_system -> pointset_powerset_grid
val ppl_new_Pointset_Powerset_Grid_from_congruences :
  congruence_system -> pointset_powerset_grid
val ppl_Pointset_Powerset_Grid_swap :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_space_dimension :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_affine_dimension :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_relation_with_constraint :
  pointset_powerset_grid ->
```

```
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Grid_relation_with_generator :
  pointset_powerset_grid ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Grid_relation_with_congruence :
  pointset_powerset_grid ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Grid_is_empty : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_universe : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_bounded : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_contains_integer_point :
  pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_topologically_closed :
  pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_discrete : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_topological_closure_assign :
  pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_pairwise_reduce :
  pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_omega_reduce : pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_bounds_from_above :
  pointset_powerset_grid -> linear_expression -> bool
val ppl_Pointset_Powerset_Grid_bounds_from_below :
  pointset_powerset_grid -> linear_expression -> bool
val ppl_Pointset_Powerset_Grid_maximize :
  pointset_powerset_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Grid_minimize :
  pointset_powerset_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Grid_maximize_with_point :
  pointset_powerset_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Grid_minimize_with_point :
  pointset_powerset_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Grid_contains_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_strictly_contains_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_is_disjoint_from_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_geometrically_covers_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_geometrically_equals_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
```

```
val ppl_Pointset_Powerset_Grid_equals_Pointset_Powerset_Grid :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_OK : pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_add_constraint :
  pointset_powerset_grid -> linear_constraint -> unit
val ppl_Pointset_Powerset_Grid_add_congruence :
  pointset_powerset_grid -> linear_congruence -> unit
val ppl_Pointset_Powerset_Grid_add_constraints :
  pointset_powerset_grid -> constraint_system -> unit
val ppl_Pointset_Powerset_Grid_add_congruences :
  pointset_powerset_grid -> congruence_system -> unit
val ppl_Pointset_Powerset_Grid_refine_with_constraint :
  pointset_powerset_grid -> linear_constraint -> unit
val ppl_Pointset_Powerset_Grid_refine_with_congruence :
  pointset_powerset_grid -> linear_congruence -> unit
val ppl_Pointset_Powerset_Grid_refine_with_constraints :
  pointset_powerset_grid -> constraint_system -> unit
val ppl_Pointset_Powerset_Grid_refine_with_congruences :
  pointset_powerset_grid -> congruence_system -> unit
val ppl_Pointset_Powerset_Grid_intersection_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_upper_bound_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_difference_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_concatenate_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_time_elapse_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_upper_bound_assign_if_exact :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_simplify_using_context_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> bool
val ppl_Pointset_Powerset_Grid_constrains :
  pointset_powerset_grid -> int -> bool
val ppl_Pointset_Powerset_Grid_unconstrain_space_dimension :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_unconstrain_space_dimensions :
  pointset_powerset_grid -> int list -> unit
val ppl_Pointset_Powerset_Grid_affine_image :
  pointset_powerset_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_affine_preimage :
  pointset_powerset_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_bounded_affine_image :
  pointset_powerset_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_Pointset_Powerset_Grid_bounded_affine_preimage :
  pointset_powerset_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_image :
  pointset_powerset_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_preimage :
  pointset_powerset_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_image_lhs_rhs :
  pointset_powerset_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Grid_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Grid_add_space_dimensions_and_embed :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_add_space_dimensions_and_project :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_remove_space_dimensions :
  pointset_powerset_grid -> int list -> unit
val ppl_Pointset_Powerset_Grid_remove_higher_space_dimensions :
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_expand_space_dimension :
  pointset_powerset_grid -> int -> int -> unit
val ppl_Pointset_Powerset_Grid_fold_space_dimensions :
  pointset_powerset_grid -> int list -> int -> unit
val ppl_Pointset_Powerset_Grid_map_space_dimensions :
  pointset_powerset_grid -> (int * int) list -> unit
val ppl_Pointset_Powerset_Grid_drop_some_non_integer_points :
  pointset_powerset_grid -> complexity_class -> unit
val ppl_Pointset_Powerset_Grid_drop_some_non_integer_points_2 :
  pointset_powerset_grid ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Grid_ascii_dump : pointset_powerset_grid -> string
val ppl_Pointset_Powerset_Grid_external_memory_in_bytes :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_total_memory_in_bytes :
  pointset_powerset_grid -> int
val ppl_Pointset_Powerset_Grid_size : pointset_powerset_grid -> int
type pointset_powerset_grid_iterator
val ppl_new_Pointset_Powerset_Grid_iterator_from_iterator :
  pointset_powerset_grid_iterator ->
  pointset_powerset_grid_iterator
```

```
val ppl_Pointset_Powerset_Grid_begin_iterator :
  pointset_powerset_grid -> pointset_powerset_grid_iterator
val ppl_Pointset_Powerset_Grid_end_iterator :
  pointset_powerset_grid -> pointset_powerset_grid_iterator
val ppl_Pointset_Powerset_Grid_iterator_equals_iterator :
  pointset_powerset_grid_iterator ->
  pointset_powerset_grid_iterator -> bool
val ppl_Pointset_Powerset_Grid_increment_iterator :
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_decrement_iterator :
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_get_disjunct :
  pointset_powerset_grid_iterator -> grid
val ppl_Pointset_Powerset_Grid_add_disjunct :
  pointset_powerset_grid -> grid -> unit
val ppl_Pointset_Powerset_Grid_drop_disjunct :
  pointset_powerset_grid ->
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_drop_disjuncts :
  pointset_powerset_grid ->
  pointset_powerset_grid_iterator ->
  pointset_powerset_grid_iterator -> unit
val ppl_Pointset_Powerset_Grid_BHZ03_Grid_congruence_widening_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_BHZ03_Grid_generator_widening_assign :
  pointset_powerset_grid -> pointset_powerset_grid -> unit
val ppl_Pointset_Powerset_Grid_BGP99_congruence_extrapolation_assign :
  pointset_powerset_grid ->
  pointset_powerset_grid -> int -> unit
val ppl_Pointset_Powerset_Grid_BGP99_generator_extrapolation_assign :
  pointset_powerset_grid ->
  pointset_powerset_grid -> int -> unit
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int8_Box :
  int8_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int16_Box :
  int16_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int32_Box :
  int32_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int64_Box :
  int64_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint8_Box :
  uint8_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint16_Box :
  uint16_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint32_Box :
```

```
  uint32_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint64_Box :
  uint64_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Z_Box :
  z_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Rational_Box :
  rational_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int8_t :
  bd_shape_int8_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int16_t :
  bd_shape_int16_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int32_t :
  bd_shape_int32_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int64_t :
  bd_shape_int64_t -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_C_Polyhedron :
  polyhedron -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_NNC_Polyhedron :
  polyhedron -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Grid :
  grid -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Float_Box :
  float_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_float :
  bd_shape_float -> constraints_product_c_polyhedron_grid
```

```
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Double_Box :
  double_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_double :
  bd_shape_double -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Long_Double_Box :
  long_double_box -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Constraints_Product_C_Polyhedr
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Rational_Box_with_complexity :
  rational_box ->
```

```
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int8_t_with_complexit
  bd_shape_int8_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int16_t_with_complexi
  bd_shape_int16_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int32_t_with_complexi
  bd_shape_int32_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_int64_t_with_complexi
  bd_shape_int64_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpz_class_with_comple
  bd_shape_mpz_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_mpq_class_with_comple
  bd_shape_mpq_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int8_t_with_co
  octagonal_shape_int8_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int16_t_with_c
  octagonal_shape_int16_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int32_t_with_c
  octagonal_shape_int32_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_int64_t_with_c
  octagonal_shape_int64_t ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpz_class_with
  octagonal_shape_mpz_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_mpq_class_with
  octagonal_shape_mpq_class ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_NNC_Polyhedron_with_complexity
  polyhedron ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Grid_with_complexity :
  grid ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_float_with_complexity
```

```
  bd_shape_float ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_float_with_com
  octagonal_shape_float ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_double_with_complexit
  bd_shape_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_double_with_co
  octagonal_shape_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Long_Double_Box_with_complexit
  long_double_box ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_BD_Shape_long_double_with_comp
  bd_shape_long_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Octagonal_Shape_long_double_wi
  octagonal_shape_long_double ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_Constraints_Product_C_Polyhedr
  constraints_product_c_polyhedron_grid ->
  complexity_class -> constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_constraints :
  constraint_system ->
  constraints_product_c_polyhedron_grid
val ppl_new_Constraints_Product_C_Polyhedron_Grid_from_congruences :
  congruence_system ->
  constraints_product_c_polyhedron_grid
val ppl_Constraints_Product_C_Polyhedron_Grid_swap :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_space_dimension :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_affine_dimension :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_constraint :
  constraints_product_c_polyhedron_grid ->
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_generator :
  constraints_product_c_polyhedron_grid ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_C_Polyhedron_Grid_relation_with_congruence :
  constraints_product_c_polyhedron_grid ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_C_Polyhedron_Grid_is_empty :
  constraints_product_c_polyhedron_grid -> bool
```

```
val ppl_Constraints_Product_C_Polyhedron_Grid_is_universe :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_bounded :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_topologically_closed :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_discrete :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_topological_closure_assign :
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_bounds_from_above :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_bounds_from_below :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_maximize :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_C_Polyhedron_Grid_minimize :
  constraints_product_c_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_C_Polyhedron_Grid_maximize_with_point :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_C_Polyhedron_Grid_minimize_with_point :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_C_Polyhedron_Grid_contains_Constraints_Product_C_Polyhedr
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_strictly_contains_Constraints_Product_C
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_is_disjoint_from_Constraints_Product_C_
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_equals_Constraints_Product_C_Polyhedron
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_OK :
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_add_constraint :
  constraints_product_c_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_congruence :
  constraints_product_c_polyhedron_grid ->
  linear_congruence -> unit
```

```
val ppl_Constraints_Product_C_Polyhedron_Grid_add_constraints :
  constraints_product_c_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_congruences :
  constraints_product_c_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_constraint :
  constraints_product_c_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_congruence :
  constraints_product_c_polyhedron_grid ->
  linear_congruence -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_constraints :
  constraints_product_c_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_refine_with_congruences :
  constraints_product_c_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_intersection_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_upper_bound_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_difference_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_concatenate_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_time_elapse_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_upper_bound_assign_if_exact :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_constrains :
  constraints_product_c_polyhedron_grid -> int -> bool
val ppl_Constraints_Product_C_Polyhedron_Grid_unconstrain_space_dimension :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_unconstrain_space_dimensions :
  constraints_product_c_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_affine_image :
  constraints_product_c_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_affine_preimage :
  constraints_product_c_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_bounded_affine_image :
  constraints_product_c_polyhedron_grid ->
```

```
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_bounded_affine_preimage :
  constraints_product_c_polyhedron_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_image :
  constraints_product_c_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_preimage :
  constraints_product_c_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_image_lhs_rhs :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_generalized_affine_preimage_lhs_rhs :
  constraints_product_c_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_space_dimensions_and_embed :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_add_space_dimensions_and_project :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_remove_space_dimensions :
  constraints_product_c_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_remove_higher_space_dimensions :
  constraints_product_c_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_expand_space_dimension :
  constraints_product_c_polyhedron_grid -> int -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_fold_space_dimensions :
  constraints_product_c_polyhedron_grid -> int list -> int -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_map_space_dimensions :
  constraints_product_c_polyhedron_grid -> (int * int) list -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_drop_some_non_integer_points :
  constraints_product_c_polyhedron_grid ->
  complexity_class -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_drop_some_non_integer_points_2 :
  constraints_product_c_polyhedron_grid ->
  int list -> complexity_class -> unit
val ppl_Constraints_Product_C_Polyhedron_Grid_ascii_dump :
  constraints_product_c_polyhedron_grid -> string
val ppl_Constraints_Product_C_Polyhedron_Grid_external_memory_in_bytes :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_total_memory_in_bytes :
  constraints_product_c_polyhedron_grid -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_widening_assign_with_tokens :
  constraints_product_c_polyhedron_grid ->
```

```
  constraints_product_c_polyhedron_grid -> int -> int
val ppl_Constraints_Product_C_Polyhedron_Grid_widening_assign :
  constraints_product_c_polyhedron_grid ->
  constraints_product_c_polyhedron_grid -> unit
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int8_Box :
  int8_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int16_Box :
  int16_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int32_Box :
  int32_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int64_Box :
  int64_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint8_Box :
  uint8_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint16_Box :
  uint16_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint32_Box :
  uint32_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint64_Box :
  uint64_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Z_Box :
  z_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Rational_Box :
  rational_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int8_t :
  bd_shape_int8_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int16_t :
  bd_shape_int16_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int32_t :
  bd_shape_int32_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int64_t :
  bd_shape_int64_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_nnc_polyhedron_grid
```

```
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_C_Polyhedron :
  polyhedron -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_NNC_Polyhedron :
  polyhedron -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Grid :
  grid -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Float_Box :
  float_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_float :
  bd_shape_float -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Double_Box :
  double_box -> constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_double :
  bd_shape_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Long_Double_Box :
  long_double_box ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_long_double
  octagonal_shape_long_double ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Constraints_Product_NNC_Poly
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int8_Box_with_complexity :
  int8_box ->
```

```
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Z_Box_with_complexity :
  z_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Rational_Box_with_complexity
  rational_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int8_t_with_complex
  bd_shape_int8_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int16_t_with_comple
  bd_shape_int16_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int32_t_with_comple
  bd_shape_int32_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_int64_t_with_comple
```

```
  bd_shape_int64_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpz_class_with_comp
  bd_shape_mpz_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_mpq_class_with_comp
  bd_shape_mpq_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int8_t_with_
  octagonal_shape_int8_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int16_t_with
  octagonal_shape_int16_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int32_t_with
  octagonal_shape_int32_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_int64_t_with
  octagonal_shape_int64_t ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpz_class_wi
  octagonal_shape_mpz_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_mpq_class_wi
  octagonal_shape_mpq_class ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_C_Polyhedron_with_complexity
  polyhedron ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_NNC_Polyhedron_with_complexi
  polyhedron ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Grid_with_complexity :
  grid ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Float_Box_with_complexity :
  float_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
```

```
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_float_with_complexi
  bd_shape_float ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_float_with_c
  octagonal_shape_float ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Double_Box_with_complexity :
  double_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_double_with_complex
  bd_shape_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_double_with_
  octagonal_shape_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Long_Double_Box_with_complex
  long_double_box ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_BD_Shape_long_double_with_co
  bd_shape_long_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Octagonal_Shape_long_double_
  octagonal_shape_long_double ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_Constraints_Product_NNC_Poly
  constraints_product_nnc_polyhedron_grid ->
  complexity_class ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_constraints :
  constraint_system ->
  constraints_product_nnc_polyhedron_grid
val ppl_new_Constraints_Product_NNC_Polyhedron_Grid_from_congruences :
  congruence_system ->
  constraints_product_nnc_polyhedron_grid
val ppl_Constraints_Product_NNC_Polyhedron_Grid_swap :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_space_dimension :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_affine_dimension :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_relation_with_constraint :
  constraints_product_nnc_polyhedron_grid ->
```

```
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_NNC_Polyhedron_Grid_relation_with_generator :
  constraints_product_nnc_polyhedron_grid ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_NNC_Polyhedron_Grid_relation_with_congruence :
  constraints_product_nnc_polyhedron_grid ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_empty :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_universe :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_bounded :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_topologically_closed :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_discrete :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_topological_closure_assign :
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounds_from_above :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounds_from_below :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_maximize :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_minimize :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_maximize_with_point :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_NNC_Polyhedron_Grid_minimize_with_point :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_NNC_Polyhedron_Grid_contains_Constraints_Product_NNC_Poly
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_strictly_contains_Constraints_Product
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_is_disjoint_from_Constraints_Product_
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_equals_Constraints_Product_NNC_Polyhe
  constraints_product_nnc_polyhedron_grid ->
```

```
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_OK :
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_constraint :
  constraints_product_nnc_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_congruence :
  constraints_product_nnc_polyhedron_grid ->
  linear_congruence -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_constraints :
  constraints_product_nnc_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_congruences :
  constraints_product_nnc_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_constraint :
  constraints_product_nnc_polyhedron_grid ->
  linear_constraint -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_congruence :
  constraints_product_nnc_polyhedron_grid ->
  linear_congruence -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_constraints :
  constraints_product_nnc_polyhedron_grid ->
  constraint_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_refine_with_congruences :
  constraints_product_nnc_polyhedron_grid ->
  congruence_system -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_intersection_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_upper_bound_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_difference_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_concatenate_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_time_elapse_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_upper_bound_assign_if_exact :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_constrains :
  constraints_product_nnc_polyhedron_grid -> int -> bool
val ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrain_space_dimension :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_unconstrain_space_dimensions :
```

```
  constraints_product_nnc_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_affine_image :
  constraints_product_nnc_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_affine_preimage :
  constraints_product_nnc_polyhedron_grid ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounded_affine_image :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_bounded_affine_preimage :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_image :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_preimage :
  constraints_product_nnc_polyhedron_grid ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_image_lhs_rhs :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_generalized_affine_preimage_lhs_rhs :
  constraints_product_nnc_polyhedron_grid ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_space_dimensions_and_embed :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_add_space_dimensions_and_project :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_remove_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> int list -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_remove_higher_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_expand_space_dimension :
  constraints_product_nnc_polyhedron_grid -> int -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_fold_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> int list -> int -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_map_space_dimensions :
  constraints_product_nnc_polyhedron_grid -> (int * int) list -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_drop_some_non_integer_points :
  constraints_product_nnc_polyhedron_grid ->
  complexity_class -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_drop_some_non_integer_points_2 :
  constraints_product_nnc_polyhedron_grid ->
```

```
  int list -> complexity_class -> unit
val ppl_Constraints_Product_NNC_Polyhedron_Grid_ascii_dump :
  constraints_product_nnc_polyhedron_grid -> string
val ppl_Constraints_Product_NNC_Polyhedron_Grid_external_memory_in_bytes :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_total_memory_in_bytes :
  constraints_product_nnc_polyhedron_grid -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_widening_assign_with_tokens :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> int -> int
val ppl_Constraints_Product_NNC_Polyhedron_Grid_widening_assign :
  constraints_product_nnc_polyhedron_grid ->
  constraints_product_nnc_polyhedron_grid -> unit
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int8_Box :
  int8_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int16_Box :
  int16_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int32_Box :
  int32_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int64_Box :
  int64_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint8_Box :
  uint8_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint16_Box :
  uint16_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint32_Box :
  uint32_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint64_Box :
  uint64_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Z_Box :
  z_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Rational_Box :
  rational_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int8_t :
  bd_shape_int8_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpq_class :
```

```
  bd_shape_mpq_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_C_Polyhedron :
  polyhedron -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_NNC_Polyhedron :
  polyhedron -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid :
  grid -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Float_Box :
  float_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_float :
  bd_shape_float -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Double_Box :
  double_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_double :
  bd_shape_double -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Long_Double_Box :
  long_double_box -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraints_Product_Grid_C_Pol
```

```
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int8_t_with_complexit
  bd_shape_int8_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int16_t_with_complexi
  bd_shape_int16_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int32_t_with_complexi
  bd_shape_int32_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_int64_t_with_complexi
  bd_shape_int64_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpz_class_with_comple
  bd_shape_mpz_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_mpq_class_with_comple
  bd_shape_mpq_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
```

```
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int8_t_with_co
  octagonal_shape_int8_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int16_t_with_c
  octagonal_shape_int16_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int32_t_with_c
  octagonal_shape_int32_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_int64_t_with_c
  octagonal_shape_int64_t ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpz_class_with
  octagonal_shape_mpz_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_mpq_class_with
  octagonal_shape_mpq_class ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_NNC_Polyhedron_with_complexity
  polyhedron ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Grid_with_complexity :
  grid ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_float_with_complexity
  bd_shape_float ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_float_with_com
  octagonal_shape_float ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_double_with_complexit
  bd_shape_double ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_double_with_co
  octagonal_shape_double ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Long_Double_Box_with_complexit
  long_double_box ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_BD_Shape_long_double_with_comp
  bd_shape_long_double ->
```

```
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Octagonal_Shape_long_double_wi
  octagonal_shape_long_double ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_Constraints_Product_Grid_C_Pol
  constraints_product_grid_c_polyhedron ->
  complexity_class -> constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_constraints :
  constraint_system ->
  constraints_product_grid_c_polyhedron
val ppl_new_Constraints_Product_Grid_C_Polyhedron_from_congruences :
  congruence_system ->
  constraints_product_grid_c_polyhedron
val ppl_Constraints_Product_Grid_C_Polyhedron_swap :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_space_dimension :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_affine_dimension :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_relation_with_constraint :
  constraints_product_grid_c_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_Grid_C_Polyhedron_relation_with_generator :
  constraints_product_grid_c_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_Grid_C_Polyhedron_relation_with_congruence :
  constraints_product_grid_c_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_Grid_C_Polyhedron_is_empty :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_universe :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_bounded :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_topologically_closed :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_discrete :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_topological_closure_assign :
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_bounds_from_above :
  constraints_product_grid_c_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_bounds_from_below :
  constraints_product_grid_c_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_maximize :
  constraints_product_grid_c_polyhedron ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_C_Polyhedron_minimize :
  constraints_product_grid_c_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_C_Polyhedron_maximize_with_point :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_C_Polyhedron_minimize_with_point :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_C_Polyhedron_contains_Constraints_Product_Grid_C_Pol
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_strictly_contains_Constraints_Product_G
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_is_disjoint_from_Constraints_Product_Gr
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_equals_Constraints_Product_Grid_C_Polyh
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_OK :
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_add_constraint :
  constraints_product_grid_c_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_congruence :
  constraints_product_grid_c_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_constraints :
  constraints_product_grid_c_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_congruences :
  constraints_product_grid_c_polyhedron ->
  congruence_system -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_constraint :
  constraints_product_grid_c_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_congruence :
  constraints_product_grid_c_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_constraints :
  constraints_product_grid_c_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_refine_with_congruences :
  constraints_product_grid_c_polyhedron ->
  congruence_system -> unit
```

```
val ppl_Constraints_Product_Grid_C_Polyhedron_intersection_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_upper_bound_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_difference_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_concatenate_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_time_elapse_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_upper_bound_assign_if_exact :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_constrains :
  constraints_product_grid_c_polyhedron -> int -> bool
val ppl_Constraints_Product_Grid_C_Polyhedron_unconstrain_space_dimension :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_unconstrain_space_dimensions :
  constraints_product_grid_c_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_affine_image :
  constraints_product_grid_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_affine_preimage :
  constraints_product_grid_c_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_bounded_affine_image :
  constraints_product_grid_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_bounded_affine_preimage :
  constraints_product_grid_c_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_image :
  constraints_product_grid_c_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_preimage :
  constraints_product_grid_c_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_image_lhs_rhs :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
```

```
val ppl_Constraints_Product_Grid_C_Polyhedron_generalized_affine_preimage_lhs_rhs :
  constraints_product_grid_c_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_space_dimensions_and_embed :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_add_space_dimensions_and_project :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_remove_space_dimensions :
  constraints_product_grid_c_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_remove_higher_space_dimensions :
  constraints_product_grid_c_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_expand_space_dimension :
  constraints_product_grid_c_polyhedron -> int -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_fold_space_dimensions :
  constraints_product_grid_c_polyhedron -> int list -> int -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_map_space_dimensions :
  constraints_product_grid_c_polyhedron -> (int * int) list -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_drop_some_non_integer_points :
  constraints_product_grid_c_polyhedron ->
  complexity_class -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_drop_some_non_integer_points_2 :
  constraints_product_grid_c_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Constraints_Product_Grid_C_Polyhedron_ascii_dump :
  constraints_product_grid_c_polyhedron -> string
val ppl_Constraints_Product_Grid_C_Polyhedron_external_memory_in_bytes :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_total_memory_in_bytes :
  constraints_product_grid_c_polyhedron -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_widening_assign_with_tokens :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> int -> int
val ppl_Constraints_Product_Grid_C_Polyhedron_widening_assign :
  constraints_product_grid_c_polyhedron ->
  constraints_product_grid_c_polyhedron -> unit
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_space_dimension :
  int ->
  degenerate_element ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int8_Box :
  int8_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int16_Box :
  int16_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int32_Box :
  int32_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int64_Box :
  int64_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box :
```

```
  uint8_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box :
  uint16_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box :
  uint32_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box :
  uint64_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Z_Box :
  z_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box :
  rational_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int8_t :
  bd_shape_int8_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int16_t :
  bd_shape_int16_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int32_t :
  bd_shape_int32_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int64_t :
  bd_shape_int64_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpz_class :
  bd_shape_mpz_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpq_class :
  bd_shape_mpq_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_C_Polyhedron :
  polyhedron -> constraints_product_grid_nnc_polyhedron
```

```
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_NNC_Polyhedron :
  polyhedron -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Grid :
  grid -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Float_Box :
  float_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_float :
  bd_shape_float -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Double_Box :
  double_box -> constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_double :
  bd_shape_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Long_Double_Box :
  long_double_box ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_long_double :
  bd_shape_long_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_long_double
  octagonal_shape_long_double ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_Grid_NNC
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class ->
```

```
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Z_Box_with_complexity :
  z_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Rational_Box_with_complexity
  rational_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int8_t_with_complex
  bd_shape_int8_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int16_t_with_comple
  bd_shape_int16_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int32_t_with_comple
  bd_shape_int32_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_int64_t_with_comple
  bd_shape_int64_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpz_class_with_comp
  bd_shape_mpz_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_mpq_class_with_comp
  bd_shape_mpq_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int8_t_with_
  octagonal_shape_int8_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int16_t_with
  octagonal_shape_int16_t ->
```

```
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int32_t_with
  octagonal_shape_int32_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_int64_t_with
  octagonal_shape_int64_t ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpz_class_wi
  octagonal_shape_mpz_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_mpq_class_wi
  octagonal_shape_mpq_class ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_C_Polyhedron_with_complexity
  polyhedron ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_NNC_Polyhedron_with_complexi
  polyhedron ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Grid_with_complexity :
  grid ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Float_Box_with_complexity :
  float_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_float_with_complexi
  bd_shape_float ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_float_with_c
  octagonal_shape_float ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Double_Box_with_complexity :
  double_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_double_with_complex
  bd_shape_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_double_with_
```

```
  octagonal_shape_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Long_Double_Box_with_complex
  long_double_box ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_BD_Shape_long_double_with_co
  bd_shape_long_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Octagonal_Shape_long_double_
  octagonal_shape_long_double ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_Constraints_Product_Grid_NNC
  constraints_product_grid_nnc_polyhedron ->
  complexity_class ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_constraints :
  constraint_system ->
  constraints_product_grid_nnc_polyhedron
val ppl_new_Constraints_Product_Grid_NNC_Polyhedron_from_congruences :
  congruence_system ->
  constraints_product_grid_nnc_polyhedron
val ppl_Constraints_Product_Grid_NNC_Polyhedron_swap :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_space_dimension :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_dimension :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_relation_with_constraint :
  constraints_product_grid_nnc_polyhedron ->
  linear_constraint -> poly_con_relation list
val ppl_Constraints_Product_Grid_NNC_Polyhedron_relation_with_generator :
  constraints_product_grid_nnc_polyhedron ->
  linear_generator -> poly_gen_relation list
val ppl_Constraints_Product_Grid_NNC_Polyhedron_relation_with_congruence :
  constraints_product_grid_nnc_polyhedron ->
  linear_congruence -> poly_con_relation list
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_empty :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_universe :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_bounded :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_topologically_closed :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_discrete :
```

```
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_topological_closure_assign :
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounds_from_above :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounds_from_below :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_maximize :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_minimize :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_maximize_with_point :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_NNC_Polyhedron_minimize_with_point :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Constraints_Product_Grid_NNC_Polyhedron_contains_Constraints_Product_Grid_NNC
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_strictly_contains_Constraints_Product
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_is_disjoint_from_Constraints_Product_
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_equals_Constraints_Product_Grid_NNC_P
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_OK :
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraint :
  constraints_product_grid_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_congruence :
  constraints_product_grid_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_constraints :
  constraints_product_grid_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_congruences :
  constraints_product_grid_nnc_polyhedron ->
  congruence_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_constraint :
```

```
  constraints_product_grid_nnc_polyhedron ->
  linear_constraint -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_congruence :
  constraints_product_grid_nnc_polyhedron ->
  linear_congruence -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_constraints :
  constraints_product_grid_nnc_polyhedron ->
  constraint_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_refine_with_congruences :
  constraints_product_grid_nnc_polyhedron ->
  congruence_system -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_intersection_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_upper_bound_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_difference_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_concatenate_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_time_elapse_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_upper_bound_assign_if_exact :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_constrains :
  constraints_product_grid_nnc_polyhedron -> int -> bool
val ppl_Constraints_Product_Grid_NNC_Polyhedron_unconstrain_space_dimension :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_unconstrain_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_image :
  constraints_product_grid_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_affine_preimage :
  constraints_product_grid_nnc_polyhedron ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounded_affine_image :
  constraints_product_grid_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_bounded_affine_preimage :
  constraints_product_grid_nnc_polyhedron ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_image :
```

```
  constraints_product_grid_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_preimage :
  constraints_product_grid_nnc_polyhedron ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_image_lhs_rhs :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_generalized_affine_preimage_lhs_rhs :
  constraints_product_grid_nnc_polyhedron ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_space_dimensions_and_embed :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_add_space_dimensions_and_project :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_remove_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int list -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_remove_higher_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_expand_space_dimension :
  constraints_product_grid_nnc_polyhedron -> int -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_fold_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> int list -> int -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_map_space_dimensions :
  constraints_product_grid_nnc_polyhedron -> (int * int) list -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_drop_some_non_integer_points :
  constraints_product_grid_nnc_polyhedron ->
  complexity_class -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_drop_some_non_integer_points_2 :
  constraints_product_grid_nnc_polyhedron ->
  int list -> complexity_class -> unit
val ppl_Constraints_Product_Grid_NNC_Polyhedron_ascii_dump :
  constraints_product_grid_nnc_polyhedron -> string
val ppl_Constraints_Product_Grid_NNC_Polyhedron_external_memory_in_bytes :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_total_memory_in_bytes :
  constraints_product_grid_nnc_polyhedron -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_widening_assign_with_tokens :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> int -> int
val ppl_Constraints_Product_Grid_NNC_Polyhedron_widening_assign :
  constraints_product_grid_nnc_polyhedron ->
  constraints_product_grid_nnc_polyhedron -> unit
val ppl_new_Float_Box_from_space_dimension :
  int -> degenerate_element -> float_box
```

```
val ppl_new_Float_Box_from_Int8_Box : int8_box -> float_box
val ppl_new_Float_Box_from_Int16_Box : int16_box -> float_box
val ppl_new_Float_Box_from_Int32_Box : int32_box -> float_box
val ppl_new_Float_Box_from_Int64_Box : int64_box -> float_box
val ppl_new_Float_Box_from_Uint8_Box : uint8_box -> float_box
val ppl_new_Float_Box_from_Uint16_Box : uint16_box -> float_box
val ppl_new_Float_Box_from_Uint32_Box : uint32_box -> float_box
val ppl_new_Float_Box_from_Uint64_Box : uint64_box -> float_box
val ppl_new_Float_Box_from_Z_Box : z_box -> float_box
val ppl_new_Float_Box_from_Rational_Box : rational_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> float_box
val ppl_new_Float_Box_from_C_Polyhedron : polyhedron -> float_box
val ppl_new_Float_Box_from_NNC_Polyhedron : polyhedron -> float_box
val ppl_new_Float_Box_from_Grid : grid -> float_box
val ppl_new_Float_Box_from_Float_Box : float_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_float : bd_shape_float -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> float_box
val ppl_new_Float_Box_from_Double_Box : double_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_double : bd_shape_double -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> float_box
val ppl_new_Float_Box_from_Long_Double_Box : long_double_box -> float_box
val ppl_new_Float_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> float_box
```

```
val ppl_new_Float_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
```

```
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> float_box
val ppl_new_Float_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> float_box
val ppl_new_Float_Box_from_Grid_with_complexity :
  grid -> complexity_class -> float_box
val ppl_new_Float_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float -> complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> float_box
val ppl_new_Float_Box_from_constraints : constraint_system -> float_box
val ppl_new_Float_Box_from_congruences : congruence_system -> float_box
val ppl_new_Float_Box_from_generators : generator_system -> float_box
val ppl_Float_Box_swap : float_box -> float_box -> unit
val ppl_Float_Box_space_dimension : float_box -> int
val ppl_Float_Box_affine_dimension : float_box -> int
val ppl_Float_Box_relation_with_constraint :
  float_box ->
  linear_constraint -> poly_con_relation list
val ppl_Float_Box_relation_with_generator :
  float_box ->
  linear_generator -> poly_gen_relation list
```

```
val ppl_Float_Box_relation_with_congruence :
  float_box ->
  linear_congruence -> poly_con_relation list
val ppl_Float_Box_get_constraints : float_box -> constraint_system
val ppl_Float_Box_get_congruences : float_box -> congruence_system
val ppl_Float_Box_get_minimized_constraints : float_box -> constraint_system
val ppl_Float_Box_get_minimized_congruences : float_box -> congruence_system
val ppl_Float_Box_is_empty : float_box -> bool
val ppl_Float_Box_is_universe : float_box -> bool
val ppl_Float_Box_is_bounded : float_box -> bool
val ppl_Float_Box_contains_integer_point : float_box -> bool
val ppl_Float_Box_is_topologically_closed : float_box -> bool
val ppl_Float_Box_is_discrete : float_box -> bool
val ppl_Float_Box_topological_closure_assign : float_box -> unit
val ppl_Float_Box_bounds_from_above : float_box -> linear_expression -> bool
val ppl_Float_Box_bounds_from_below : float_box -> linear_expression -> bool
val ppl_Float_Box_maximize :
  float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Float_Box_minimize :
  float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Float_Box_maximize_with_point :
  float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Float_Box_minimize_with_point :
  float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Float_Box_frequency :
  float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Float_Box_contains_Float_Box : float_box -> float_box -> bool
val ppl_Float_Box_strictly_contains_Float_Box :
  float_box -> float_box -> bool
val ppl_Float_Box_is_disjoint_from_Float_Box : float_box -> float_box -> bool
val ppl_Float_Box_equals_Float_Box : float_box -> float_box -> bool
val ppl_Float_Box_OK : float_box -> bool
val ppl_Float_Box_add_constraint : float_box -> linear_constraint -> unit
val ppl_Float_Box_add_congruence : float_box -> linear_congruence -> unit
val ppl_Float_Box_add_constraints : float_box -> constraint_system -> unit
val ppl_Float_Box_add_congruences : float_box -> congruence_system -> unit
val ppl_Float_Box_refine_with_constraint :
  float_box -> linear_constraint -> unit
val ppl_Float_Box_refine_with_congruence :
  float_box -> linear_congruence -> unit
```

```
val ppl_Float_Box_refine_with_constraints :
  float_box -> constraint_system -> unit
val ppl_Float_Box_refine_with_congruences :
  float_box -> congruence_system -> unit
val ppl_Float_Box_intersection_assign : float_box -> float_box -> unit
val ppl_Float_Box_upper_bound_assign : float_box -> float_box -> unit
val ppl_Float_Box_difference_assign : float_box -> float_box -> unit
val ppl_Float_Box_concatenate_assign : float_box -> float_box -> unit
val ppl_Float_Box_time_elapse_assign : float_box -> float_box -> unit
val ppl_Float_Box_upper_bound_assign_if_exact :
  float_box -> float_box -> bool
val ppl_Float_Box_simplify_using_context_assign :
  float_box -> float_box -> bool
val ppl_Float_Box_constrains : float_box -> int -> bool
val ppl_Float_Box_unconstrain_space_dimension : float_box -> int -> unit
val ppl_Float_Box_unconstrain_space_dimensions :
  float_box -> int list -> unit
val ppl_Float_Box_affine_image :
  float_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_affine_preimage :
  float_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_bounded_affine_image :
  float_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_bounded_affine_preimage :
  float_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_generalized_affine_image :
  float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_generalized_affine_preimage :
  float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Float_Box_generalized_affine_image_lhs_rhs :
  float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Float_Box_generalized_affine_preimage_lhs_rhs :
  float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Float_Box_add_space_dimensions_and_embed : float_box -> int -> unit
val ppl_Float_Box_add_space_dimensions_and_project : float_box -> int -> unit
val ppl_Float_Box_remove_space_dimensions : float_box -> int list -> unit
```

```
val ppl_Float_Box_remove_higher_space_dimensions : float_box -> int -> unit
val ppl_Float_Box_expand_space_dimension : float_box -> int -> int -> unit
val ppl_Float_Box_fold_space_dimensions :
  float_box -> int list -> int -> unit
val ppl_Float_Box_map_space_dimensions :
  float_box -> (int * int) list -> unit
val ppl_Float_Box_drop_some_non_integer_points :
  float_box -> complexity_class -> unit
val ppl_Float_Box_drop_some_non_integer_points_2 :
  float_box -> int list -> complexity_class -> unit
val ppl_Float_Box_ascii_dump : float_box -> string
val ppl_Float_Box_external_memory_in_bytes : float_box -> int
val ppl_Float_Box_total_memory_in_bytes : float_box -> int
val ppl_Float_Box_CC76_widening_assign_with_tokens :
  float_box -> float_box -> int -> int
val ppl_Float_Box_CC76_widening_assign : float_box -> float_box -> unit
val ppl_Float_Box_widening_assign_with_tokens :
  float_box -> float_box -> int -> int
val ppl_Float_Box_widening_assign : float_box -> float_box -> unit
val ppl_Float_Box_limited_CC76_extrapolation_assign_with_tokens :
  float_box ->
  float_box -> constraint_system -> int -> int
val ppl_Float_Box_limited_CC76_extrapolation_assign :
  float_box ->
  float_box -> constraint_system -> unit
val ppl_Float_Box_linear_partition :
  float_box ->
  float_box ->
  float_box * pointset_powerset_nnc_polyhedron
val ppl_Float_Box_wrap_assign :
  float_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Float_Box : float_box -> bool
val ppl_termination_test_PR_Float_Box : float_box -> bool
val ppl_one_affine_ranking_function_MS_Float_Box :
  float_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Float_Box :
  float_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Float_Box : float_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Float_Box : float_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Float_Box :
  float_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Float_Box_2 : float_box -> float_box -> bool
val ppl_termination_test_PR_Float_Box_2 : float_box -> float_box -> bool
```

```
val ppl_one_affine_ranking_function_MS_Float_Box_2 :
  float_box ->
  float_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Float_Box_2 :
  float_box ->
  float_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Float_Box_2 :
  float_box -> float_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Float_Box_2 :
  float_box -> float_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Float_Box_2 :
  float_box ->
  float_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_float_from_space_dimension :
  int -> degenerate_element -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int8_Box : int8_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int16_Box : int16_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int32_Box : int32_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int64_Box : int64_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint8_Box : uint8_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint16_Box : uint16_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint32_Box : uint32_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint64_Box : uint64_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Z_Box : z_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_Rational_Box : rational_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_float
```

```
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_C_Polyhedron : polyhedron -> bd_shape_float
val ppl_new_BD_Shape_float_from_NNC_Polyhedron : polyhedron -> bd_shape_float
val ppl_new_BD_Shape_float_from_Grid : grid -> bd_shape_float
val ppl_new_BD_Shape_float_from_Float_Box : float_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_float :
  bd_shape_float -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_float
val ppl_new_BD_Shape_float_from_Double_Box : double_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_double :
  bd_shape_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Long_Double_Box :
  long_double_box -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_float
```

```
val ppl_new_BD_Shape_float_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Float_Box_with_complexity :
  float_box -> complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Double_Box_with_complexity :
```

```
  double_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_float
val ppl_new_BD_Shape_float_from_constraints :
  constraint_system -> bd_shape_float
val ppl_new_BD_Shape_float_from_congruences :
  congruence_system -> bd_shape_float
val ppl_new_BD_Shape_float_from_generators :
  generator_system -> bd_shape_float
val ppl_BD_Shape_float_swap : bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_space_dimension : bd_shape_float -> int
val ppl_BD_Shape_float_affine_dimension : bd_shape_float -> int
val ppl_BD_Shape_float_relation_with_constraint :
  bd_shape_float ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_float_relation_with_generator :
  bd_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_float_relation_with_congruence :
  bd_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_float_get_constraints : bd_shape_float -> constraint_system
val ppl_BD_Shape_float_get_congruences : bd_shape_float -> congruence_system
val ppl_BD_Shape_float_get_minimized_constraints :
  bd_shape_float -> constraint_system
val ppl_BD_Shape_float_get_minimized_congruences :
  bd_shape_float -> congruence_system
val ppl_BD_Shape_float_is_empty : bd_shape_float -> bool
val ppl_BD_Shape_float_is_universe : bd_shape_float -> bool
val ppl_BD_Shape_float_is_bounded : bd_shape_float -> bool
val ppl_BD_Shape_float_contains_integer_point : bd_shape_float -> bool
val ppl_BD_Shape_float_is_topologically_closed : bd_shape_float -> bool
val ppl_BD_Shape_float_is_discrete : bd_shape_float -> bool
val ppl_BD_Shape_float_topological_closure_assign : bd_shape_float -> unit
```

```
val ppl_BD_Shape_float_bounds_from_above :
  bd_shape_float -> linear_expression -> bool
val ppl_BD_Shape_float_bounds_from_below :
  bd_shape_float -> linear_expression -> bool
val ppl_BD_Shape_float_maximize :
  bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_float_minimize :
  bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_float_maximize_with_point :
  bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_float_minimize_with_point :
  bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_float_frequency :
  bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_float_contains_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_strictly_contains_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_is_disjoint_from_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_equals_BD_Shape_float :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_OK : bd_shape_float -> bool
val ppl_BD_Shape_float_add_constraint :
  bd_shape_float -> linear_constraint -> unit
val ppl_BD_Shape_float_add_congruence :
  bd_shape_float -> linear_congruence -> unit
val ppl_BD_Shape_float_add_constraints :
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_add_congruences :
  bd_shape_float -> congruence_system -> unit
val ppl_BD_Shape_float_refine_with_constraint :
  bd_shape_float -> linear_constraint -> unit
val ppl_BD_Shape_float_refine_with_congruence :
  bd_shape_float -> linear_congruence -> unit
val ppl_BD_Shape_float_refine_with_constraints :
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_refine_with_congruences :
  bd_shape_float -> congruence_system -> unit
val ppl_BD_Shape_float_intersection_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_upper_bound_assign :
```

```
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_difference_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_concatenate_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_time_elapse_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_upper_bound_assign_if_exact :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_simplify_using_context_assign :
  bd_shape_float -> bd_shape_float -> bool
val ppl_BD_Shape_float_constrains : bd_shape_float -> int -> bool
val ppl_BD_Shape_float_unconstrain_space_dimension :
  bd_shape_float -> int -> unit
val ppl_BD_Shape_float_unconstrain_space_dimensions :
  bd_shape_float -> int list -> unit
val ppl_BD_Shape_float_affine_image :
  bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_affine_preimage :
  bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_bounded_affine_image :
  bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_bounded_affine_preimage :
  bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_generalized_affine_image :
  bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_generalized_affine_preimage :
  bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_float_generalized_affine_image_lhs_rhs :
  bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_float_generalized_affine_preimage_lhs_rhs :
  bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_float_add_space_dimensions_and_embed :
  bd_shape_float -> int -> unit
val ppl_BD_Shape_float_add_space_dimensions_and_project :
  bd_shape_float -> int -> unit
```

```
val ppl_BD_Shape_float_remove_space_dimensions :
  bd_shape_float -> int list -> unit
val ppl_BD_Shape_float_remove_higher_space_dimensions :
  bd_shape_float -> int -> unit
val ppl_BD_Shape_float_expand_space_dimension :
  bd_shape_float -> int -> int -> unit
val ppl_BD_Shape_float_fold_space_dimensions :
  bd_shape_float -> int list -> int -> unit
val ppl_BD_Shape_float_map_space_dimensions :
  bd_shape_float -> (int * int) list -> unit
val ppl_BD_Shape_float_drop_some_non_integer_points :
  bd_shape_float -> complexity_class -> unit
val ppl_BD_Shape_float_drop_some_non_integer_points_2 :
  bd_shape_float -> int list -> complexity_class -> unit
val ppl_BD_Shape_float_ascii_dump : bd_shape_float -> string
val ppl_BD_Shape_float_external_memory_in_bytes : bd_shape_float -> int
val ppl_BD_Shape_float_total_memory_in_bytes : bd_shape_float -> int
val ppl_BD_Shape_float_BHMZ05_widening_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
val ppl_BD_Shape_float_H79_widening_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
val ppl_BD_Shape_float_BHMZ05_widening_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_H79_widening_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_widening_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
val ppl_BD_Shape_float_widening_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> int -> int
val ppl_BD_Shape_float_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> int -> int
val ppl_BD_Shape_float_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> int -> int
val ppl_BD_Shape_float_limited_BHMZ05_extrapolation_assign :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_limited_H79_extrapolation_assign :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_limited_CC76_extrapolation_assign :
  bd_shape_float ->
  bd_shape_float -> constraint_system -> unit
val ppl_BD_Shape_float_CC76_extrapolation_assign_with_tokens :
  bd_shape_float -> bd_shape_float -> int -> int
```

```
val ppl_BD_Shape_float_CC76_extrapolation_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_CC76_narrowing_assign :
  bd_shape_float -> bd_shape_float -> unit
val ppl_BD_Shape_float_linear_partition :
  bd_shape_float ->
  bd_shape_float ->
  bd_shape_float * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_float_wrap_assign :
  bd_shape_float ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_float : bd_shape_float -> bool
val ppl_termination_test_PR_BD_Shape_float : bd_shape_float -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_float :
  bd_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_float :
  bd_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_float :
  bd_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_float :
  bd_shape_float -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_float :
  bd_shape_float -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> bool
val ppl_termination_test_PR_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_float_2 :
  bd_shape_float ->
  bd_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_float_2 :
  bd_shape_float ->
  bd_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_float_2 :
  bd_shape_float -> bd_shape_float -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_float_2 :
  bd_shape_float ->
  bd_shape_float -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_float_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int8_Box :
  int8_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int16_Box :
```

```
  int16_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int32_Box :
  int32_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int64_Box :
  int64_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint8_Box :
  uint8_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint16_Box :
  uint16_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint32_Box :
  uint32_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint64_Box :
  uint64_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Z_Box : z_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Rational_Box :
  rational_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_C_Polyhedron :
  polyhedron -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Grid : grid -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Float_Box :
  float_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_float :
```

```
  bd_shape_float -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Double_Box :
  double_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Long_Double_Box :
  long_double_box -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int16_t_with_complexity :
```

```
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_float
```

```
val ppl_new_Octagonal_Shape_float_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_constraints :
  constraint_system -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_congruences :
  congruence_system -> octagonal_shape_float
val ppl_new_Octagonal_Shape_float_from_generators :
  generator_system -> octagonal_shape_float
val ppl_Octagonal_Shape_float_swap :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_space_dimension : octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_affine_dimension : octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_relation_with_constraint :
  octagonal_shape_float ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_float_relation_with_generator :
  octagonal_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_float_relation_with_congruence :
  octagonal_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_float_get_constraints :
  octagonal_shape_float -> constraint_system
val ppl_Octagonal_Shape_float_get_congruences :
  octagonal_shape_float -> congruence_system
val ppl_Octagonal_Shape_float_get_minimized_constraints :
  octagonal_shape_float -> constraint_system
val ppl_Octagonal_Shape_float_get_minimized_congruences :
  octagonal_shape_float -> congruence_system
val ppl_Octagonal_Shape_float_is_empty : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_universe : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_bounded : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_contains_integer_point :
```

```
  octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_topologically_closed :
  octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_discrete : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_topological_closure_assign :
  octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_bounds_from_above :
  octagonal_shape_float -> linear_expression -> bool
val ppl_Octagonal_Shape_float_bounds_from_below :
  octagonal_shape_float -> linear_expression -> bool
val ppl_Octagonal_Shape_float_maximize :
  octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_float_minimize :
  octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_float_maximize_with_point :
  octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_float_minimize_with_point :
  octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_float_frequency :
  octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_float_contains_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_strictly_contains_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_is_disjoint_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_equals_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_OK : octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_add_constraint :
  octagonal_shape_float -> linear_constraint -> unit
val ppl_Octagonal_Shape_float_add_congruence :
  octagonal_shape_float -> linear_congruence -> unit
val ppl_Octagonal_Shape_float_add_constraints :
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_add_congruences :
  octagonal_shape_float -> congruence_system -> unit
val ppl_Octagonal_Shape_float_refine_with_constraint :
  octagonal_shape_float -> linear_constraint -> unit
val ppl_Octagonal_Shape_float_refine_with_congruence :
  octagonal_shape_float -> linear_congruence -> unit
val ppl_Octagonal_Shape_float_refine_with_constraints :
```

```
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_refine_with_congruences :
  octagonal_shape_float -> congruence_system -> unit
val ppl_Octagonal_Shape_float_intersection_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_upper_bound_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_difference_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_concatenate_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_time_elapse_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_upper_bound_assign_if_exact :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_simplify_using_context_assign :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_Octagonal_Shape_float_constrains :
  octagonal_shape_float -> int -> bool
val ppl_Octagonal_Shape_float_unconstrain_space_dimension :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_unconstrain_space_dimensions :
  octagonal_shape_float -> int list -> unit
val ppl_Octagonal_Shape_float_affine_image :
  octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_affine_preimage :
  octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_bounded_affine_image :
  octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_bounded_affine_preimage :
  octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_generalized_affine_image :
  octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_generalized_affine_preimage :
  octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_float_generalized_affine_image_lhs_rhs :
  octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
```

```
val ppl_Octagonal_Shape_float_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_float_add_space_dimensions_and_embed :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_add_space_dimensions_and_project :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_remove_space_dimensions :
  octagonal_shape_float -> int list -> unit
val ppl_Octagonal_Shape_float_remove_higher_space_dimensions :
  octagonal_shape_float -> int -> unit
val ppl_Octagonal_Shape_float_expand_space_dimension :
  octagonal_shape_float -> int -> int -> unit
val ppl_Octagonal_Shape_float_fold_space_dimensions :
  octagonal_shape_float -> int list -> int -> unit
val ppl_Octagonal_Shape_float_map_space_dimensions :
  octagonal_shape_float -> (int * int) list -> unit
val ppl_Octagonal_Shape_float_drop_some_non_integer_points :
  octagonal_shape_float -> complexity_class -> unit
val ppl_Octagonal_Shape_float_drop_some_non_integer_points_2 :
  octagonal_shape_float ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_float_ascii_dump : octagonal_shape_float -> string
val ppl_Octagonal_Shape_float_external_memory_in_bytes :
  octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_total_memory_in_bytes :
  octagonal_shape_float -> int
val ppl_Octagonal_Shape_float_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> int -> int
val ppl_Octagonal_Shape_float_BHMZ05_widening_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_widening_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> int -> int
val ppl_Octagonal_Shape_float_widening_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> constraint_system -> int -> int
val ppl_Octagonal_Shape_float_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> constraint_system -> int -> int
val ppl_Octagonal_Shape_float_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_float ->
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_limited_CC76_extrapolation_assign :
  octagonal_shape_float ->
```

```
  octagonal_shape_float -> constraint_system -> unit
val ppl_Octagonal_Shape_float_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_float ->
  octagonal_shape_float -> int -> int
val ppl_Octagonal_Shape_float_CC76_extrapolation_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_CC76_narrowing_assign :
  octagonal_shape_float -> octagonal_shape_float -> unit
val ppl_Octagonal_Shape_float_linear_partition :
  octagonal_shape_float ->
  octagonal_shape_float ->
  octagonal_shape_float * pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_float_wrap_assign :
  octagonal_shape_float ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_float :
  octagonal_shape_float -> bool
val ppl_termination_test_PR_Octagonal_Shape_float :
  octagonal_shape_float -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_float :
  octagonal_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_float :
  octagonal_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_float :
  octagonal_shape_float -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_float :
  octagonal_shape_float ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_termination_test_PR_Octagonal_Shape_float_2 :
  octagonal_shape_float -> octagonal_shape_float -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float -> polyhedron
```

```
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_float_2 :
  octagonal_shape_float ->
  octagonal_shape_float ->
  polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Float_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Float_Box :
  float_box -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Pointset_Powerset_Float_Box_with_complex
  pointset_powerset_float_box ->
  complexity_class -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_constraints :
  constraint_system -> pointset_powerset_float_box
val ppl_new_Pointset_Powerset_Float_Box_from_congruences :
  congruence_system -> pointset_powerset_float_box
val ppl_Pointset_Powerset_Float_Box_swap :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_space_dimension :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_affine_dimension :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_relation_with_constraint :
  pointset_powerset_float_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Float_Box_relation_with_generator :
  pointset_powerset_float_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Float_Box_relation_with_congruence :
  pointset_powerset_float_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Float_Box_is_empty :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_universe :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_bounded :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_contains_integer_point :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_topologically_closed :
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_discrete :
  pointset_powerset_float_box -> bool
```

```
val ppl_Pointset_Powerset_Float_Box_topological_closure_assign :
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_pairwise_reduce :
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_omega_reduce :
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_bounds_from_above :
  pointset_powerset_float_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Float_Box_bounds_from_below :
  pointset_powerset_float_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Float_Box_maximize :
  pointset_powerset_float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Float_Box_minimize :
  pointset_powerset_float_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Float_Box_maximize_with_point :
  pointset_powerset_float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Float_Box_minimize_with_point :
  pointset_powerset_float_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Float_Box_contains_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_strictly_contains_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_is_disjoint_from_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_geometrically_covers_Pointset_Powerset_Float_Box
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_geometrically_equals_Pointset_Powerset_Float_Box
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_equals_Pointset_Powerset_Float_Box :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_OK : pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_add_constraint :
  pointset_powerset_float_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Float_Box_add_congruence :
  pointset_powerset_float_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Float_Box_add_constraints :
  pointset_powerset_float_box -> constraint_system -> unit
```

```
val ppl_Pointset_Powerset_Float_Box_add_congruences :
  pointset_powerset_float_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_constraint :
  pointset_powerset_float_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_congruence :
  pointset_powerset_float_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_constraints :
  pointset_powerset_float_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Float_Box_refine_with_congruences :
  pointset_powerset_float_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Float_Box_intersection_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_upper_bound_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_difference_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_concatenate_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_time_elapse_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> unit
val ppl_Pointset_Powerset_Float_Box_upper_bound_assign_if_exact :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_simplify_using_context_assign :
  pointset_powerset_float_box ->
  pointset_powerset_float_box -> bool
val ppl_Pointset_Powerset_Float_Box_constrains :
  pointset_powerset_float_box -> int -> bool
val ppl_Pointset_Powerset_Float_Box_unconstrain_space_dimension :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_unconstrain_space_dimensions :
  pointset_powerset_float_box -> int list -> unit
val ppl_Pointset_Powerset_Float_Box_affine_image :
  pointset_powerset_float_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_affine_preimage :
  pointset_powerset_float_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_bounded_affine_image :
  pointset_powerset_float_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_bounded_affine_preimage :
  pointset_powerset_float_box ->
  int ->
```

```
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_image :
  pointset_powerset_float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_preimage :
  pointset_powerset_float_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Float_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_float_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Float_Box_add_space_dimensions_and_embed :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_add_space_dimensions_and_project :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_remove_space_dimensions :
  pointset_powerset_float_box -> int list -> unit
val ppl_Pointset_Powerset_Float_Box_remove_higher_space_dimensions :
  pointset_powerset_float_box -> int -> unit
val ppl_Pointset_Powerset_Float_Box_expand_space_dimension :
  pointset_powerset_float_box -> int -> int -> unit
val ppl_Pointset_Powerset_Float_Box_fold_space_dimensions :
  pointset_powerset_float_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Float_Box_map_space_dimensions :
  pointset_powerset_float_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Float_Box_drop_some_non_integer_points :
  pointset_powerset_float_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Float_Box_drop_some_non_integer_points_2 :
  pointset_powerset_float_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Float_Box_ascii_dump :
  pointset_powerset_float_box -> string
val ppl_Pointset_Powerset_Float_Box_external_memory_in_bytes :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_total_memory_in_bytes :
  pointset_powerset_float_box -> int
val ppl_Pointset_Powerset_Float_Box_size : pointset_powerset_float_box -> int
type pointset_powerset_float_box_iterator
val ppl_new_Pointset_Powerset_Float_Box_iterator_from_iterator :
  pointset_powerset_float_box_iterator ->
  pointset_powerset_float_box_iterator
val ppl_Pointset_Powerset_Float_Box_begin_iterator :
  pointset_powerset_float_box ->
```

```
  pointset_powerset_float_box_iterator
val ppl_Pointset_Powerset_Float_Box_end_iterator :
  pointset_powerset_float_box ->
  pointset_powerset_float_box_iterator
val ppl_Pointset_Powerset_Float_Box_iterator_equals_iterator :
  pointset_powerset_float_box_iterator ->
  pointset_powerset_float_box_iterator -> bool
val ppl_Pointset_Powerset_Float_Box_increment_iterator :
  pointset_powerset_float_box_iterator -> unit
val ppl_Pointset_Powerset_Float_Box_decrement_iterator :
  pointset_powerset_float_box_iterator -> unit
val ppl_Pointset_Powerset_Float_Box_get_disjunct :
  pointset_powerset_float_box_iterator -> float_box
val ppl_Pointset_Powerset_Float_Box_add_disjunct :
  pointset_powerset_float_box -> float_box -> unit
val ppl_Pointset_Powerset_Float_Box_drop_disjunct :
  pointset_powerset_float_box ->
  pointset_powerset_float_box_iterator -> unit
val ppl_Pointset_Powerset_Float_Box_drop_disjuncts :
  pointset_powerset_float_box ->
  pointset_powerset_float_box_iterator ->
  pointset_powerset_float_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_float_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_Pointset_Powerset_BD_Shape_float :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_BD_Shape_float :
  bd_shape_float -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_Pointset_Powerset_BD_Shape_float_wi
  pointset_powerset_bd_shape_float ->
  complexity_class -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_float
val ppl_new_Pointset_Powerset_BD_Shape_float_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_float
val ppl_Pointset_Powerset_BD_Shape_float_swap :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_space_dimension :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_affine_dimension :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_relation_with_constraint :
  pointset_powerset_bd_shape_float ->
```

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  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_float_relation_with_generator :
  pointset_powerset_bd_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_float_relation_with_congruence :
  pointset_powerset_bd_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_float_is_empty :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_universe :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_bounded :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_contains_integer_point :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_topologically_closed :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_discrete :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_topological_closure_assign :
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_pairwise_reduce :
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_omega_reduce :
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_bounds_from_above :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_float_bounds_from_below :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_float_maximize :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_float_minimize :
  pointset_powerset_bd_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_float_maximize_with_point :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_float_minimize_with_point :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_float_contains_Pointset_Powerset_BD_Shape_float :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_strictly_contains_Pointset_Powerset_BD_Shape
```

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  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_is_disjoint_from_Pointset_Powerset_BD_Shape_
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_geometrically_covers_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_geometrically_equals_Pointset_Powerset_BD_Sh
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_equals_Pointset_Powerset_BD_Shape_float :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_OK :
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_add_constraint :
  pointset_powerset_bd_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_congruence :
  pointset_powerset_bd_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_constraints :
  pointset_powerset_bd_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_congruences :
  pointset_powerset_bd_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_constraint :
  pointset_powerset_bd_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_congruence :
  pointset_powerset_bd_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_constraints :
  pointset_powerset_bd_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_refine_with_congruences :
  pointset_powerset_bd_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_float_intersection_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_upper_bound_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_difference_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_concatenate_assign :
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  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_time_elapse_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_simplify_using_context_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> bool
val ppl_Pointset_Powerset_BD_Shape_float_constrains :
  pointset_powerset_bd_shape_float -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_float_unconstrain_space_dimension :
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_float -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_float_affine_image :
  pointset_powerset_bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_affine_preimage :
  pointset_powerset_bd_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_bounded_affine_image :
  pointset_powerset_bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_bounded_affine_preimage :
  pointset_powerset_bd_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_image :
  pointset_powerset_bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_preimage :
  pointset_powerset_bd_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_float_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_add_space_dimensions_and_project :
```

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  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_remove_space_dimensions :
  pointset_powerset_bd_shape_float -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_float_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_expand_space_dimension :
  pointset_powerset_bd_shape_float -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_fold_space_dimensions :
  pointset_powerset_bd_shape_float -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_map_space_dimensions :
  pointset_powerset_bd_shape_float -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_some_non_integer_points :
  pointset_powerset_bd_shape_float ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_float ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_float_ascii_dump :
  pointset_powerset_bd_shape_float -> string
val ppl_Pointset_Powerset_BD_Shape_float_external_memory_in_bytes :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_total_memory_in_bytes :
  pointset_powerset_bd_shape_float -> int
val ppl_Pointset_Powerset_BD_Shape_float_size :
  pointset_powerset_bd_shape_float -> int
type pointset_powerset_bd_shape_float_iterator
val ppl_new_Pointset_Powerset_BD_Shape_float_iterator_from_iterator :
  pointset_powerset_bd_shape_float_iterator ->
  pointset_powerset_bd_shape_float_iterator
val ppl_Pointset_Powerset_BD_Shape_float_begin_iterator :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator
val ppl_Pointset_Powerset_BD_Shape_float_end_iterator :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator
val ppl_Pointset_Powerset_BD_Shape_float_iterator_equals_iterator :
  pointset_powerset_bd_shape_float_iterator ->
  pointset_powerset_bd_shape_float_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_float_increment_iterator :
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_decrement_iterator :
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_get_disjunct :
  pointset_powerset_bd_shape_float_iterator ->
  bd_shape_float
val ppl_Pointset_Powerset_BD_Shape_float_add_disjunct :
  pointset_powerset_bd_shape_float ->
  bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_disjunct :
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  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_drop_disjuncts :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float_iterator ->
  pointset_powerset_bd_shape_float_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_float_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_float ->
  pointset_powerset_bd_shape_float -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Octagonal_Shape_float :
  octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_float ->
  complexity_class ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_Octagonal_Shape_float_with_c
  octagonal_shape_float ->
  complexity_class ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_float
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_float
val ppl_Pointset_Powerset_Octagonal_Shape_float_swap :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_space_dimension :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_affine_dimension :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_relation_with_constraint :
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  pointset_powerset_octagonal_shape_float ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_float_relation_with_generator :
  pointset_powerset_octagonal_shape_float ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_float_relation_with_congruence :
  pointset_powerset_octagonal_shape_float ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_empty :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_universe :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_bounded :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_contains_integer_point :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_topologically_closed :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_discrete :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_topological_closure_assign :
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_pairwise_reduce :
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_omega_reduce :
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounds_from_above :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounds_from_below :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_maximize :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_minimize :
  pointset_powerset_octagonal_shape_float ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_maximize_with_point :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_float_minimize_with_point :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_float_contains_Pointset_Powerset_Octagonal_
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
```

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val ppl_Pointset_Powerset_Octagonal_Shape_float_strictly_contains_Pointset_Powerset_O
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_is_disjoint_from_Pointset_Powerset_Oc
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_geometrically_covers_Pointset_Powerse
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_geometrically_equals_Pointset_Powerse
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_equals_Pointset_Powerset_Octagonal_Sh
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_OK :
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_constraint :
  pointset_powerset_octagonal_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_congruence :
  pointset_powerset_octagonal_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_constraints :
  pointset_powerset_octagonal_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_congruences :
  pointset_powerset_octagonal_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_constraint :
  pointset_powerset_octagonal_shape_float ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_congruence :
  pointset_powerset_octagonal_shape_float ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_constraints :
  pointset_powerset_octagonal_shape_float ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_refine_with_congruences :
  pointset_powerset_octagonal_shape_float ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_intersection_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_upper_bound_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_difference_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
```

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val ppl_Pointset_Powerset_Octagonal_Shape_float_concatenate_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_time_elapse_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_constrains :
  pointset_powerset_octagonal_shape_float -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_affine_image :
  pointset_powerset_octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_affine_preimage :
  pointset_powerset_octagonal_shape_float ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounded_affine_image :
  pointset_powerset_octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_float ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_image :
  pointset_powerset_octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_float ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_octagonal_shape_float ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_float -> int -> unit
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_remove_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_expand_space_dimension :
  pointset_powerset_octagonal_shape_float -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_fold_space_dimensions :
  pointset_powerset_octagonal_shape_float -> int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_map_space_dimensions :
  pointset_powerset_octagonal_shape_float -> (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_float ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_float ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_ascii_dump :
  pointset_powerset_octagonal_shape_float -> string
val ppl_Pointset_Powerset_Octagonal_Shape_float_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_float -> int
val ppl_Pointset_Powerset_Octagonal_Shape_float_size :
  pointset_powerset_octagonal_shape_float -> int
type pointset_powerset_octagonal_shape_float_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_float_iterator_from_iterator :
  pointset_powerset_octagonal_shape_float_iterator ->
  pointset_powerset_octagonal_shape_float_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_float_begin_iterator :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_float_end_iterator :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_float_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_float_iterator ->
  pointset_powerset_octagonal_shape_float_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_float_increment_iterator :
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_decrement_iterator :
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_get_disjunct :
  pointset_powerset_octagonal_shape_float_iterator ->
  octagonal_shape_float
val ppl_Pointset_Powerset_Octagonal_Shape_float_add_disjunct :
  pointset_powerset_octagonal_shape_float ->
  octagonal_shape_float -> unit
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_disjunct :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_drop_disjuncts :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float_iterator ->
  pointset_powerset_octagonal_shape_float_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_float_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_float ->
  pointset_powerset_octagonal_shape_float -> int -> unit
val ppl_new_Double_Box_from_space_dimension :
  int -> degenerate_element -> double_box
val ppl_new_Double_Box_from_Int8_Box : int8_box -> double_box
val ppl_new_Double_Box_from_Int16_Box : int16_box -> double_box
val ppl_new_Double_Box_from_Int32_Box : int32_box -> double_box
val ppl_new_Double_Box_from_Int64_Box : int64_box -> double_box
val ppl_new_Double_Box_from_Uint8_Box : uint8_box -> double_box
val ppl_new_Double_Box_from_Uint16_Box : uint16_box -> double_box
val ppl_new_Double_Box_from_Uint32_Box : uint32_box -> double_box
val ppl_new_Double_Box_from_Uint64_Box : uint64_box -> double_box
val ppl_new_Double_Box_from_Z_Box : z_box -> double_box
val ppl_new_Double_Box_from_Rational_Box : rational_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_int8_t : bd_shape_int8_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_int16_t : bd_shape_int16_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_int32_t : bd_shape_int32_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_int64_t : bd_shape_int64_t -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> double_box
val ppl_new_Double_Box_from_C_Polyhedron : polyhedron -> double_box
val ppl_new_Double_Box_from_NNC_Polyhedron : polyhedron -> double_box
```

```
val ppl_new_Double_Box_from_Grid : grid -> double_box
val ppl_new_Double_Box_from_Float_Box : float_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_float : bd_shape_float -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> double_box
val ppl_new_Double_Box_from_Double_Box : double_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_double : bd_shape_double -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> double_box
val ppl_new_Double_Box_from_Long_Double_Box : long_double_box -> double_box
val ppl_new_Double_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> double_box
val ppl_new_Double_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Int16_Box_with_complexity :
  int16_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Int32_Box_with_complexity :
  int32_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Int64_Box_with_complexity :
  int64_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint8_Box_with_complexity :
  uint8_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint16_Box_with_complexity :
  uint16_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint32_Box_with_complexity :
  uint32_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Uint64_Box_with_complexity :
  uint64_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_Rational_Box_with_complexity :
  rational_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
```

```
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_C_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> double_box
val ppl_new_Double_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron -> complexity_class -> double_box
val ppl_new_Double_Box_from_Grid_with_complexity :
  grid -> complexity_class -> double_box
val ppl_new_Double_Box_from_Float_Box_with_complexity :
  float_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Double_Box_with_complexity :
  double_box -> complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> double_box
```

```
val ppl_new_Double_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> double_box
val ppl_new_Double_Box_from_constraints : constraint_system -> double_box
val ppl_new_Double_Box_from_congruences : congruence_system -> double_box
val ppl_new_Double_Box_from_generators : generator_system -> double_box
val ppl_Double_Box_swap : double_box -> double_box -> unit
val ppl_Double_Box_space_dimension : double_box -> int
val ppl_Double_Box_affine_dimension : double_box -> int
val ppl_Double_Box_relation_with_constraint :
  double_box ->
  linear_constraint -> poly_con_relation list
val ppl_Double_Box_relation_with_generator :
  double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Double_Box_relation_with_congruence :
  double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Double_Box_get_constraints : double_box -> constraint_system
val ppl_Double_Box_get_congruences : double_box -> congruence_system
val ppl_Double_Box_get_minimized_constraints :
  double_box -> constraint_system
val ppl_Double_Box_get_minimized_congruences :
  double_box -> congruence_system
val ppl_Double_Box_is_empty : double_box -> bool
val ppl_Double_Box_is_universe : double_box -> bool
val ppl_Double_Box_is_bounded : double_box -> bool
val ppl_Double_Box_contains_integer_point : double_box -> bool
val ppl_Double_Box_is_topologically_closed : double_box -> bool
val ppl_Double_Box_is_discrete : double_box -> bool
val ppl_Double_Box_topological_closure_assign : double_box -> unit
val ppl_Double_Box_bounds_from_above :
  double_box -> linear_expression -> bool
val ppl_Double_Box_bounds_from_below :
  double_box -> linear_expression -> bool
val ppl_Double_Box_maximize :
  double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Double_Box_minimize :
  double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Double_Box_maximize_with_point :
  double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Double_Box_minimize_with_point :
  double_box ->
  linear_expression ->
```

```
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Double_Box_frequency :
  double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Double_Box_contains_Double_Box : double_box -> double_box -> bool
val ppl_Double_Box_strictly_contains_Double_Box :
  double_box -> double_box -> bool
val ppl_Double_Box_is_disjoint_from_Double_Box :
  double_box -> double_box -> bool
val ppl_Double_Box_equals_Double_Box : double_box -> double_box -> bool
val ppl_Double_Box_OK : double_box -> bool
val ppl_Double_Box_add_constraint : double_box -> linear_constraint -> unit
val ppl_Double_Box_add_congruence : double_box -> linear_congruence -> unit
val ppl_Double_Box_add_constraints : double_box -> constraint_system -> unit
val ppl_Double_Box_add_congruences : double_box -> congruence_system -> unit
val ppl_Double_Box_refine_with_constraint :
  double_box -> linear_constraint -> unit
val ppl_Double_Box_refine_with_congruence :
  double_box -> linear_congruence -> unit
val ppl_Double_Box_refine_with_constraints :
  double_box -> constraint_system -> unit
val ppl_Double_Box_refine_with_congruences :
  double_box -> congruence_system -> unit
val ppl_Double_Box_intersection_assign : double_box -> double_box -> unit
val ppl_Double_Box_upper_bound_assign : double_box -> double_box -> unit
val ppl_Double_Box_difference_assign : double_box -> double_box -> unit
val ppl_Double_Box_concatenate_assign : double_box -> double_box -> unit
val ppl_Double_Box_time_elapse_assign : double_box -> double_box -> unit
val ppl_Double_Box_upper_bound_assign_if_exact :
  double_box -> double_box -> bool
val ppl_Double_Box_simplify_using_context_assign :
  double_box -> double_box -> bool
val ppl_Double_Box_constrains : double_box -> int -> bool
val ppl_Double_Box_unconstrain_space_dimension : double_box -> int -> unit
val ppl_Double_Box_unconstrain_space_dimensions :
  double_box -> int list -> unit
val ppl_Double_Box_affine_image :
  double_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_affine_preimage :
  double_box -> int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_bounded_affine_image :
  double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_bounded_affine_preimage :
  double_box ->
  int ->
```

```
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_generalized_affine_image :
  double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_generalized_affine_preimage :
  double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Double_Box_generalized_affine_image_lhs_rhs :
  double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Double_Box_generalized_affine_preimage_lhs_rhs :
  double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Double_Box_add_space_dimensions_and_embed : double_box -> int -> unit
val ppl_Double_Box_add_space_dimensions_and_project :
  double_box -> int -> unit
val ppl_Double_Box_remove_space_dimensions : double_box -> int list -> unit
val ppl_Double_Box_remove_higher_space_dimensions : double_box -> int -> unit
val ppl_Double_Box_expand_space_dimension : double_box -> int -> int -> unit
val ppl_Double_Box_fold_space_dimensions :
  double_box -> int list -> int -> unit
val ppl_Double_Box_map_space_dimensions :
  double_box -> (int * int) list -> unit
val ppl_Double_Box_drop_some_non_integer_points :
  double_box -> complexity_class -> unit
val ppl_Double_Box_drop_some_non_integer_points_2 :
  double_box -> int list -> complexity_class -> unit
val ppl_Double_Box_ascii_dump : double_box -> string
val ppl_Double_Box_external_memory_in_bytes : double_box -> int
val ppl_Double_Box_total_memory_in_bytes : double_box -> int
val ppl_Double_Box_CC76_widening_assign_with_tokens :
  double_box -> double_box -> int -> int
val ppl_Double_Box_CC76_widening_assign : double_box -> double_box -> unit
val ppl_Double_Box_widening_assign_with_tokens :
  double_box -> double_box -> int -> int
val ppl_Double_Box_widening_assign : double_box -> double_box -> unit
val ppl_Double_Box_limited_CC76_extrapolation_assign_with_tokens :
  double_box ->
  double_box -> constraint_system -> int -> int
val ppl_Double_Box_limited_CC76_extrapolation_assign :
  double_box ->
  double_box -> constraint_system -> unit
val ppl_Double_Box_linear_partition :
  double_box ->
```

```
  double_box ->
  double_box * pointset_powerset_nnc_polyhedron
val ppl_Double_Box_wrap_assign :
  double_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Double_Box : double_box -> bool
val ppl_termination_test_PR_Double_Box : double_box -> bool
val ppl_one_affine_ranking_function_MS_Double_Box :
  double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Double_Box :
  double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Double_Box : double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Double_Box : double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Double_Box :
  double_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Double_Box_2 : double_box -> double_box -> bool
val ppl_termination_test_PR_Double_Box_2 : double_box -> double_box -> bool
val ppl_one_affine_ranking_function_MS_Double_Box_2 :
  double_box ->
  double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Double_Box_2 :
  double_box ->
  double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Double_Box_2 :
  double_box -> double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Double_Box_2 :
  double_box -> double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Double_Box_2 :
  double_box ->
  double_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_double_from_space_dimension :
  int -> degenerate_element -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int8_Box : int8_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int16_Box : int16_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int32_Box : int32_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int64_Box : int64_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint8_Box : uint8_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint16_Box : uint16_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint32_Box : uint32_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint64_Box : uint64_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Z_Box : z_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_Rational_Box :
  rational_box -> bd_shape_double
```

```
val ppl_new_BD_Shape_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_C_Polyhedron : polyhedron -> bd_shape_double
val ppl_new_BD_Shape_double_from_NNC_Polyhedron :
  polyhedron -> bd_shape_double
val ppl_new_BD_Shape_double_from_Grid : grid -> bd_shape_double
val ppl_new_BD_Shape_double_from_Float_Box : float_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_float :
  bd_shape_float -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_double
val ppl_new_BD_Shape_double_from_Double_Box : double_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_double :
  bd_shape_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Long_Double_Box :
  long_double_box -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int16_Box_with_complexity :
  int16_box ->
```

```
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Z_Box_with_complexity :
  z_box -> complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
```

```
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Grid_with_complexity :
  grid -> complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_double
val ppl_new_BD_Shape_double_from_constraints :
  constraint_system -> bd_shape_double
val ppl_new_BD_Shape_double_from_congruences :
  congruence_system -> bd_shape_double
val ppl_new_BD_Shape_double_from_generators :
```

```
  generator_system -> bd_shape_double
val ppl_BD_Shape_double_swap : bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_space_dimension : bd_shape_double -> int
val ppl_BD_Shape_double_affine_dimension : bd_shape_double -> int
val ppl_BD_Shape_double_relation_with_constraint :
  bd_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_double_relation_with_generator :
  bd_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_double_relation_with_congruence :
  bd_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_double_get_constraints :
  bd_shape_double -> constraint_system
val ppl_BD_Shape_double_get_congruences :
  bd_shape_double -> congruence_system
val ppl_BD_Shape_double_get_minimized_constraints :
  bd_shape_double -> constraint_system
val ppl_BD_Shape_double_get_minimized_congruences :
  bd_shape_double -> congruence_system
val ppl_BD_Shape_double_is_empty : bd_shape_double -> bool
val ppl_BD_Shape_double_is_universe : bd_shape_double -> bool
val ppl_BD_Shape_double_is_bounded : bd_shape_double -> bool
val ppl_BD_Shape_double_contains_integer_point : bd_shape_double -> bool
val ppl_BD_Shape_double_is_topologically_closed : bd_shape_double -> bool
val ppl_BD_Shape_double_is_discrete : bd_shape_double -> bool
val ppl_BD_Shape_double_topological_closure_assign : bd_shape_double -> unit
val ppl_BD_Shape_double_bounds_from_above :
  bd_shape_double -> linear_expression -> bool
val ppl_BD_Shape_double_bounds_from_below :
  bd_shape_double -> linear_expression -> bool
val ppl_BD_Shape_double_maximize :
  bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_double_minimize :
  bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_double_maximize_with_point :
  bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_double_minimize_with_point :
  bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_double_frequency :
  bd_shape_double ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_BD_Shape_double_contains_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_strictly_contains_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_is_disjoint_from_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_equals_BD_Shape_double :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_OK : bd_shape_double -> bool
val ppl_BD_Shape_double_add_constraint :
  bd_shape_double -> linear_constraint -> unit
val ppl_BD_Shape_double_add_congruence :
  bd_shape_double -> linear_congruence -> unit
val ppl_BD_Shape_double_add_constraints :
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_add_congruences :
  bd_shape_double -> congruence_system -> unit
val ppl_BD_Shape_double_refine_with_constraint :
  bd_shape_double -> linear_constraint -> unit
val ppl_BD_Shape_double_refine_with_congruence :
  bd_shape_double -> linear_congruence -> unit
val ppl_BD_Shape_double_refine_with_constraints :
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_refine_with_congruences :
  bd_shape_double -> congruence_system -> unit
val ppl_BD_Shape_double_intersection_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_upper_bound_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_difference_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_concatenate_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_time_elapse_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_upper_bound_assign_if_exact :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_simplify_using_context_assign :
  bd_shape_double -> bd_shape_double -> bool
val ppl_BD_Shape_double_constrains : bd_shape_double -> int -> bool
val ppl_BD_Shape_double_unconstrain_space_dimension :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_unconstrain_space_dimensions :
  bd_shape_double -> int list -> unit
val ppl_BD_Shape_double_affine_image :
  bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
```

```
val ppl_BD_Shape_double_affine_preimage :
  bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_bounded_affine_image :
  bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_bounded_affine_preimage :
  bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_generalized_affine_image :
  bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_generalized_affine_preimage :
  bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_double_generalized_affine_image_lhs_rhs :
  bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_double_generalized_affine_preimage_lhs_rhs :
  bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_double_add_space_dimensions_and_embed :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_add_space_dimensions_and_project :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_remove_space_dimensions :
  bd_shape_double -> int list -> unit
val ppl_BD_Shape_double_remove_higher_space_dimensions :
  bd_shape_double -> int -> unit
val ppl_BD_Shape_double_expand_space_dimension :
  bd_shape_double -> int -> int -> unit
val ppl_BD_Shape_double_fold_space_dimensions :
  bd_shape_double -> int list -> int -> unit
val ppl_BD_Shape_double_map_space_dimensions :
  bd_shape_double -> (int * int) list -> unit
val ppl_BD_Shape_double_drop_some_non_integer_points :
  bd_shape_double -> complexity_class -> unit
val ppl_BD_Shape_double_drop_some_non_integer_points_2 :
  bd_shape_double -> int list -> complexity_class -> unit
val ppl_BD_Shape_double_ascii_dump : bd_shape_double -> string
val ppl_BD_Shape_double_external_memory_in_bytes : bd_shape_double -> int
val ppl_BD_Shape_double_total_memory_in_bytes : bd_shape_double -> int
val ppl_BD_Shape_double_BHMZ05_widening_assign_with_tokens :
```

```
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_H79_widening_assign_with_tokens :
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_BHMZ05_widening_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_H79_widening_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_widening_assign_with_tokens :
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_widening_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> int -> int
val ppl_BD_Shape_double_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> int -> int
val ppl_BD_Shape_double_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> int -> int
val ppl_BD_Shape_double_limited_BHMZ05_extrapolation_assign :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_limited_H79_extrapolation_assign :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_limited_CC76_extrapolation_assign :
  bd_shape_double ->
  bd_shape_double -> constraint_system -> unit
val ppl_BD_Shape_double_CC76_extrapolation_assign_with_tokens :
  bd_shape_double -> bd_shape_double -> int -> int
val ppl_BD_Shape_double_CC76_extrapolation_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_CC76_narrowing_assign :
  bd_shape_double -> bd_shape_double -> unit
val ppl_BD_Shape_double_linear_partition :
  bd_shape_double ->
  bd_shape_double ->
  bd_shape_double * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_double_wrap_assign :
  bd_shape_double ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_double : bd_shape_double -> bool
val ppl_termination_test_PR_BD_Shape_double : bd_shape_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_double :
```

```
  bd_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_double :
  bd_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_double :
  bd_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_double :
  bd_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_double :
  bd_shape_double -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_double_2 :
  bd_shape_double -> bd_shape_double -> bool
val ppl_termination_test_PR_BD_Shape_double_2 :
  bd_shape_double -> bd_shape_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_double_2 :
  bd_shape_double ->
  bd_shape_double -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_double_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int8_Box :
  int8_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int16_Box :
  int16_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int32_Box :
  int32_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int64_Box :
  int64_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint8_Box :
  uint8_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint16_Box :
  uint16_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint32_Box :
  uint32_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint64_Box :
  uint64_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Z_Box :
  z_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Rational_Box :
```

```
  rational_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_C_Polyhedron :
  polyhedron -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Grid : grid -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Float_Box :
  float_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Double_Box :
  double_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Long_Double_Box :
  long_double_box -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> octagonal_shape_double
```

```
val ppl_new_Octagonal_Shape_double_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
```

```
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_Octagonal_Shape_long_double_with_complexity :
```

```
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_constraints :
  constraint_system -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_congruences :
  congruence_system -> octagonal_shape_double
val ppl_new_Octagonal_Shape_double_from_generators :
  generator_system -> octagonal_shape_double
val ppl_Octagonal_Shape_double_swap :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_space_dimension :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_affine_dimension :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_relation_with_constraint :
  octagonal_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_double_relation_with_generator :
  octagonal_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_double_relation_with_congruence :
  octagonal_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_double_get_constraints :
  octagonal_shape_double -> constraint_system
val ppl_Octagonal_Shape_double_get_congruences :
  octagonal_shape_double -> congruence_system
val ppl_Octagonal_Shape_double_get_minimized_constraints :
  octagonal_shape_double -> constraint_system
val ppl_Octagonal_Shape_double_get_minimized_congruences :
  octagonal_shape_double -> congruence_system
val ppl_Octagonal_Shape_double_is_empty : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_universe : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_bounded : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_contains_integer_point :
  octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_topologically_closed :
  octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_discrete : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_topological_closure_assign :
  octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_bounds_from_above :
  octagonal_shape_double -> linear_expression -> bool
val ppl_Octagonal_Shape_double_bounds_from_below :
  octagonal_shape_double -> linear_expression -> bool
val ppl_Octagonal_Shape_double_maximize :
  octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
```

```
val ppl_Octagonal_Shape_double_minimize :
  octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_double_maximize_with_point :
  octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_double_minimize_with_point :
  octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_double_frequency :
  octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_double_contains_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_strictly_contains_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_is_disjoint_from_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_equals_Octagonal_Shape_double :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_OK : octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_add_constraint :
  octagonal_shape_double -> linear_constraint -> unit
val ppl_Octagonal_Shape_double_add_congruence :
  octagonal_shape_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_double_add_constraints :
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_add_congruences :
  octagonal_shape_double -> congruence_system -> unit
val ppl_Octagonal_Shape_double_refine_with_constraint :
  octagonal_shape_double -> linear_constraint -> unit
val ppl_Octagonal_Shape_double_refine_with_congruence :
  octagonal_shape_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_double_refine_with_constraints :
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_refine_with_congruences :
  octagonal_shape_double -> congruence_system -> unit
val ppl_Octagonal_Shape_double_intersection_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_upper_bound_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_difference_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_concatenate_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_time_elapse_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
```

```
val ppl_Octagonal_Shape_double_upper_bound_assign_if_exact :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_simplify_using_context_assign :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_Octagonal_Shape_double_constrains :
  octagonal_shape_double -> int -> bool
val ppl_Octagonal_Shape_double_unconstrain_space_dimension :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_unconstrain_space_dimensions :
  octagonal_shape_double -> int list -> unit
val ppl_Octagonal_Shape_double_affine_image :
  octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_affine_preimage :
  octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_bounded_affine_image :
  octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_bounded_affine_preimage :
  octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_generalized_affine_image :
  octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_generalized_affine_preimage :
  octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_double_generalized_affine_image_lhs_rhs :
  octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_double_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_double_add_space_dimensions_and_embed :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_add_space_dimensions_and_project :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_remove_space_dimensions :
  octagonal_shape_double -> int list -> unit
val ppl_Octagonal_Shape_double_remove_higher_space_dimensions :
  octagonal_shape_double -> int -> unit
val ppl_Octagonal_Shape_double_expand_space_dimension :
  octagonal_shape_double -> int -> int -> unit
```

```
val ppl_Octagonal_Shape_double_fold_space_dimensions :
  octagonal_shape_double -> int list -> int -> unit
val ppl_Octagonal_Shape_double_map_space_dimensions :
  octagonal_shape_double -> (int * int) list -> unit
val ppl_Octagonal_Shape_double_drop_some_non_integer_points :
  octagonal_shape_double -> complexity_class -> unit
val ppl_Octagonal_Shape_double_drop_some_non_integer_points_2 :
  octagonal_shape_double ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_double_ascii_dump : octagonal_shape_double -> string
val ppl_Octagonal_Shape_double_external_memory_in_bytes :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_total_memory_in_bytes :
  octagonal_shape_double -> int
val ppl_Octagonal_Shape_double_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> int -> int
val ppl_Octagonal_Shape_double_BHMZ05_widening_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_widening_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> int -> int
val ppl_Octagonal_Shape_double_widening_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> int -> int
val ppl_Octagonal_Shape_double_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> int -> int
val ppl_Octagonal_Shape_double_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_limited_CC76_extrapolation_assign :
  octagonal_shape_double ->
  octagonal_shape_double -> constraint_system -> unit
val ppl_Octagonal_Shape_double_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_double ->
  octagonal_shape_double -> int -> int
val ppl_Octagonal_Shape_double_CC76_extrapolation_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_CC76_narrowing_assign :
  octagonal_shape_double -> octagonal_shape_double -> unit
val ppl_Octagonal_Shape_double_linear_partition :
  octagonal_shape_double ->
  octagonal_shape_double ->
  octagonal_shape_double * pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_double_wrap_assign :
  octagonal_shape_double ->
```

```
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_double :
  octagonal_shape_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_double :
  octagonal_shape_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_double :
  octagonal_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_double :
  octagonal_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double :
  octagonal_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_double :
  octagonal_shape_double ->
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_double_2 :
  octagonal_shape_double -> octagonal_shape_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_double_2 :
  octagonal_shape_double ->
  octagonal_shape_double ->
  polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Double_Box_from_space_dimension :
  int -> degenerate_element -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_Double_Box :
  double_box -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_Pointset_Powerset_Double_Box_with_compl
  pointset_powerset_double_box ->
  complexity_class -> pointset_powerset_double_box
```

```
val ppl_new_Pointset_Powerset_Double_Box_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_constraints :
  constraint_system -> pointset_powerset_double_box
val ppl_new_Pointset_Powerset_Double_Box_from_congruences :
  congruence_system -> pointset_powerset_double_box
val ppl_Pointset_Powerset_Double_Box_swap :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_space_dimension :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_affine_dimension :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_relation_with_constraint :
  pointset_powerset_double_box ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Double_Box_relation_with_generator :
  pointset_powerset_double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Double_Box_relation_with_congruence :
  pointset_powerset_double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Double_Box_is_empty :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_universe :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_bounded :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_contains_integer_point :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_topologically_closed :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_discrete :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_topological_closure_assign :
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_pairwise_reduce :
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_omega_reduce :
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_bounds_from_above :
  pointset_powerset_double_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Double_Box_bounds_from_below :
  pointset_powerset_double_box -> linear_expression -> bool
val ppl_Pointset_Powerset_Double_Box_maximize :
  pointset_powerset_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Double_Box_minimize :
```

```
  pointset_powerset_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Double_Box_maximize_with_point :
  pointset_powerset_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Double_Box_minimize_with_point :
  pointset_powerset_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Double_Box_contains_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_strictly_contains_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_is_disjoint_from_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_geometrically_covers_Pointset_Powerset_Double_Bo
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_geometrically_equals_Pointset_Powerset_Double_Bo
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_equals_Pointset_Powerset_Double_Box :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_OK :
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_add_constraint :
  pointset_powerset_double_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Double_Box_add_congruence :
  pointset_powerset_double_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Double_Box_add_constraints :
  pointset_powerset_double_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Double_Box_add_congruences :
  pointset_powerset_double_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_constraint :
  pointset_powerset_double_box -> linear_constraint -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_congruence :
  pointset_powerset_double_box -> linear_congruence -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_constraints :
  pointset_powerset_double_box -> constraint_system -> unit
val ppl_Pointset_Powerset_Double_Box_refine_with_congruences :
  pointset_powerset_double_box -> congruence_system -> unit
val ppl_Pointset_Powerset_Double_Box_intersection_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
```

```
val ppl_Pointset_Powerset_Double_Box_upper_bound_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_difference_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_concatenate_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_time_elapse_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> unit
val ppl_Pointset_Powerset_Double_Box_upper_bound_assign_if_exact :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_simplify_using_context_assign :
  pointset_powerset_double_box ->
  pointset_powerset_double_box -> bool
val ppl_Pointset_Powerset_Double_Box_constrains :
  pointset_powerset_double_box -> int -> bool
val ppl_Pointset_Powerset_Double_Box_unconstrain_space_dimension :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_unconstrain_space_dimensions :
  pointset_powerset_double_box -> int list -> unit
val ppl_Pointset_Powerset_Double_Box_affine_image :
  pointset_powerset_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_affine_preimage :
  pointset_powerset_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_bounded_affine_image :
  pointset_powerset_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_bounded_affine_preimage :
  pointset_powerset_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_generalized_affine_image :
  pointset_powerset_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_generalized_affine_preimage :
  pointset_powerset_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Double_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
```

```
val ppl_Pointset_Powerset_Double_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Double_Box_add_space_dimensions_and_embed :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_add_space_dimensions_and_project :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_remove_space_dimensions :
  pointset_powerset_double_box -> int list -> unit
val ppl_Pointset_Powerset_Double_Box_remove_higher_space_dimensions :
  pointset_powerset_double_box -> int -> unit
val ppl_Pointset_Powerset_Double_Box_expand_space_dimension :
  pointset_powerset_double_box -> int -> int -> unit
val ppl_Pointset_Powerset_Double_Box_fold_space_dimensions :
  pointset_powerset_double_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Double_Box_map_space_dimensions :
  pointset_powerset_double_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Double_Box_drop_some_non_integer_points :
  pointset_powerset_double_box -> complexity_class -> unit
val ppl_Pointset_Powerset_Double_Box_drop_some_non_integer_points_2 :
  pointset_powerset_double_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Double_Box_ascii_dump :
  pointset_powerset_double_box -> string
val ppl_Pointset_Powerset_Double_Box_external_memory_in_bytes :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_total_memory_in_bytes :
  pointset_powerset_double_box -> int
val ppl_Pointset_Powerset_Double_Box_size :
  pointset_powerset_double_box -> int
type pointset_powerset_double_box_iterator
val ppl_new_Pointset_Powerset_Double_Box_iterator_from_iterator :
  pointset_powerset_double_box_iterator ->
  pointset_powerset_double_box_iterator
val ppl_Pointset_Powerset_Double_Box_begin_iterator :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator
val ppl_Pointset_Powerset_Double_Box_end_iterator :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator
val ppl_Pointset_Powerset_Double_Box_iterator_equals_iterator :
  pointset_powerset_double_box_iterator ->
  pointset_powerset_double_box_iterator -> bool
val ppl_Pointset_Powerset_Double_Box_increment_iterator :
  pointset_powerset_double_box_iterator -> unit
val ppl_Pointset_Powerset_Double_Box_decrement_iterator :
  pointset_powerset_double_box_iterator -> unit
val ppl_Pointset_Powerset_Double_Box_get_disjunct :
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  pointset_powerset_double_box_iterator -> double_box
val ppl_Pointset_Powerset_Double_Box_add_disjunct :
  pointset_powerset_double_box -> double_box -> unit
val ppl_Pointset_Powerset_Double_Box_drop_disjunct :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator -> unit
val ppl_Pointset_Powerset_Double_Box_drop_disjuncts :
  pointset_powerset_double_box ->
  pointset_powerset_double_box_iterator ->
  pointset_powerset_double_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_double_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_Pointset_Powerset_BD_Shape_double
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_BD_Shape_double :
  bd_shape_double -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_Pointset_Powerset_BD_Shape_double_
  pointset_powerset_bd_shape_double ->
  complexity_class -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_constraints :
  constraint_system -> pointset_powerset_bd_shape_double
val ppl_new_Pointset_Powerset_BD_Shape_double_from_congruences :
  congruence_system -> pointset_powerset_bd_shape_double
val ppl_Pointset_Powerset_BD_Shape_double_swap :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_space_dimension :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_affine_dimension :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_relation_with_constraint :
  pointset_powerset_bd_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_double_relation_with_generator :
  pointset_powerset_bd_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_double_relation_with_congruence :
  pointset_powerset_bd_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_double_is_empty :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_universe :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_bounded :
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  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_contains_integer_point :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_topologically_closed :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_discrete :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_topological_closure_assign :
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_pairwise_reduce :
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_omega_reduce :
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_bounds_from_above :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_double_bounds_from_below :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_double_maximize :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_double_minimize :
  pointset_powerset_bd_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_double_maximize_with_point :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_double_minimize_with_point :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_double_contains_Pointset_Powerset_BD_Shape_double
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_strictly_contains_Pointset_Powerset_BD_Shap
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_is_disjoint_from_Pointset_Powerset_BD_Shape
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_geometrically_covers_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_geometrically_equals_Pointset_Powerset_BD_S
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_equals_Pointset_Powerset_BD_Shape_double :
  pointset_powerset_bd_shape_double ->
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  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_OK :
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_add_constraint :
  pointset_powerset_bd_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_congruence :
  pointset_powerset_bd_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_constraints :
  pointset_powerset_bd_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_congruences :
  pointset_powerset_bd_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_constraint :
  pointset_powerset_bd_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_congruence :
  pointset_powerset_bd_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_constraints :
  pointset_powerset_bd_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_refine_with_congruences :
  pointset_powerset_bd_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_double_intersection_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_upper_bound_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_difference_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_concatenate_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_time_elapse_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_simplify_using_context_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> bool
val ppl_Pointset_Powerset_BD_Shape_double_constrains :
  pointset_powerset_bd_shape_double -> int -> bool
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val ppl_Pointset_Powerset_BD_Shape_double_unconstrain_space_dimension :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_double_affine_image :
  pointset_powerset_bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_affine_preimage :
  pointset_powerset_bd_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_bounded_affine_image :
  pointset_powerset_bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_bounded_affine_preimage :
  pointset_powerset_bd_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_image :
  pointset_powerset_bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_preimage :
  pointset_powerset_bd_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_double_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_remove_space_dimensions :
  pointset_powerset_bd_shape_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_double_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_expand_space_dimension :
  pointset_powerset_bd_shape_double -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_fold_space_dimensions :
  pointset_powerset_bd_shape_double -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_map_space_dimensions :
  pointset_powerset_bd_shape_double -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_some_non_integer_points :
  pointset_powerset_bd_shape_double ->
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  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_double_ascii_dump :
  pointset_powerset_bd_shape_double -> string
val ppl_Pointset_Powerset_BD_Shape_double_external_memory_in_bytes :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_total_memory_in_bytes :
  pointset_powerset_bd_shape_double -> int
val ppl_Pointset_Powerset_BD_Shape_double_size :
  pointset_powerset_bd_shape_double -> int
type pointset_powerset_bd_shape_double_iterator
val ppl_new_Pointset_Powerset_BD_Shape_double_iterator_from_iterator :
  pointset_powerset_bd_shape_double_iterator ->
  pointset_powerset_bd_shape_double_iterator
val ppl_Pointset_Powerset_BD_Shape_double_begin_iterator :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator
val ppl_Pointset_Powerset_BD_Shape_double_end_iterator :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator
val ppl_Pointset_Powerset_BD_Shape_double_iterator_equals_iterator :
  pointset_powerset_bd_shape_double_iterator ->
  pointset_powerset_bd_shape_double_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_double_increment_iterator :
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_decrement_iterator :
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_get_disjunct :
  pointset_powerset_bd_shape_double_iterator ->
  bd_shape_double
val ppl_Pointset_Powerset_BD_Shape_double_add_disjunct :
  pointset_powerset_bd_shape_double ->
  bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_disjunct :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_drop_disjuncts :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double_iterator ->
  pointset_powerset_bd_shape_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BGP99_BHMZ05_extrapolation_assign :
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  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_double_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_double ->
  pointset_powerset_bd_shape_double -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Octagonal_Shape_double :
  octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_Octagonal_Shape_double_with
  octagonal_shape_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_double
val ppl_Pointset_Powerset_Octagonal_Shape_double_swap :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_space_dimension :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_affine_dimension :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_relation_with_constraint :
  pointset_powerset_octagonal_shape_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_double_relation_with_generator :
  pointset_powerset_octagonal_shape_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_double_relation_with_congruence :
  pointset_powerset_octagonal_shape_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_empty :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_universe :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_bounded :
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  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_contains_integer_point :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_topologically_closed :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_discrete :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_topological_closure_assign :
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_pairwise_reduce :
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_omega_reduce :
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounds_from_above :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounds_from_below :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_maximize :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_minimize :
  pointset_powerset_octagonal_shape_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_maximize_with_point :
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_double_minimize_with_point :
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_double_contains_Pointset_Powerset_Octagonal
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_strictly_contains_Pointset_Powerset_
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_is_disjoint_from_Pointset_Powerset_O
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_geometrically_covers_Pointset_Powers
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_geometrically_equals_Pointset_Powers
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_equals_Pointset_Powerset_Octagonal_S
  pointset_powerset_octagonal_shape_double ->
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  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_OK :
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_constraint :
  pointset_powerset_octagonal_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_congruence :
  pointset_powerset_octagonal_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_constraints :
  pointset_powerset_octagonal_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_congruences :
  pointset_powerset_octagonal_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_constraint :
  pointset_powerset_octagonal_shape_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_congruence :
  pointset_powerset_octagonal_shape_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_constraints :
  pointset_powerset_octagonal_shape_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_refine_with_congruences :
  pointset_powerset_octagonal_shape_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_intersection_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_upper_bound_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_difference_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_concatenate_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_time_elapse_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_constrains :
  pointset_powerset_octagonal_shape_double -> int -> bool
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_double_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_affine_image :
  pointset_powerset_octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_affine_preimage :
  pointset_powerset_octagonal_shape_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounded_affine_image :
  pointset_powerset_octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_image :
  pointset_powerset_octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_image_lhs_rhs :
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_generalized_affine_preimage_lhs_rhs
  pointset_powerset_octagonal_shape_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_space_dimensions_and_embed :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_space_dimensions_and_project :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_remove_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_remove_higher_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_expand_space_dimension :
  pointset_powerset_octagonal_shape_double -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_fold_space_dimensions :
  pointset_powerset_octagonal_shape_double -> int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_map_space_dimensions :
  pointset_powerset_octagonal_shape_double ->
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_some_non_integer_points :
```

```
  pointset_powerset_octagonal_shape_double ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_some_non_integer_points_2 :
  pointset_powerset_octagonal_shape_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_ascii_dump :
  pointset_powerset_octagonal_shape_double -> string
val ppl_Pointset_Powerset_Octagonal_Shape_double_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_double_size :
  pointset_powerset_octagonal_shape_double -> int
type pointset_powerset_octagonal_shape_double_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_double_iterator_from_iterator :
  pointset_powerset_octagonal_shape_double_iterator ->
  pointset_powerset_octagonal_shape_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_double_begin_iterator :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_double_end_iterator :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_double_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_double_iterator ->
  pointset_powerset_octagonal_shape_double_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_double_increment_iterator :
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_decrement_iterator :
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_get_disjunct :
  pointset_powerset_octagonal_shape_double_iterator ->
  octagonal_shape_double
val ppl_Pointset_Powerset_Octagonal_Shape_double_add_disjunct :
  pointset_powerset_octagonal_shape_double ->
  octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_disjunct :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_drop_disjuncts :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double_iterator ->
  pointset_powerset_octagonal_shape_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_double_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_octagonal_shape_double ->
  pointset_powerset_octagonal_shape_double -> int -> unit
```

```
val ppl_new_Long_Double_Box_from_space_dimension :
  int -> degenerate_element -> long_double_box
val ppl_new_Long_Double_Box_from_Int8_Box : int8_box -> long_double_box
val ppl_new_Long_Double_Box_from_Int16_Box : int16_box -> long_double_box
val ppl_new_Long_Double_Box_from_Int32_Box : int32_box -> long_double_box
val ppl_new_Long_Double_Box_from_Int64_Box : int64_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint8_Box : uint8_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint16_Box : uint16_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint32_Box : uint32_box -> long_double_box
val ppl_new_Long_Double_Box_from_Uint64_Box : uint64_box -> long_double_box
val ppl_new_Long_Double_Box_from_Z_Box : z_box -> long_double_box
val ppl_new_Long_Double_Box_from_Rational_Box :
  rational_box -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int8_t :
  bd_shape_int8_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int16_t :
  bd_shape_int16_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int32_t :
  bd_shape_int32_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int64_t :
  bd_shape_int64_t -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> long_double_box
val ppl_new_Long_Double_Box_from_C_Polyhedron : polyhedron -> long_double_box
val ppl_new_Long_Double_Box_from_NNC_Polyhedron :
  polyhedron -> long_double_box
val ppl_new_Long_Double_Box_from_Grid : grid -> long_double_box
val ppl_new_Long_Double_Box_from_Float_Box : float_box -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_float :
  bd_shape_float -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_float :
  octagonal_shape_float -> long_double_box
val ppl_new_Long_Double_Box_from_Double_Box : double_box -> long_double_box
```

```
val ppl_new_Long_Double_Box_from_BD_Shape_double :
  bd_shape_double -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_double :
  octagonal_shape_double -> long_double_box
val ppl_new_Long_Double_Box_from_Long_Double_Box :
  long_double_box -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_long_double :
  bd_shape_long_double -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> long_double_box
val ppl_new_Long_Double_Box_from_Int8_Box_with_complexity :
  int8_box -> complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Z_Box_with_complexity :
  z_box -> complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> long_double_box
```

```
val ppl_new_Long_Double_Box_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Grid_with_complexity :
  grid -> complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> long_double_box
```

```
val ppl_new_Long_Double_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> long_double_box
val ppl_new_Long_Double_Box_from_constraints :
  constraint_system -> long_double_box
val ppl_new_Long_Double_Box_from_congruences :
  congruence_system -> long_double_box
val ppl_new_Long_Double_Box_from_generators :
  generator_system -> long_double_box
val ppl_Long_Double_Box_swap : long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_space_dimension : long_double_box -> int
val ppl_Long_Double_Box_affine_dimension : long_double_box -> int
val ppl_Long_Double_Box_relation_with_constraint :
  long_double_box ->
  linear_constraint -> poly_con_relation list
val ppl_Long_Double_Box_relation_with_generator :
  long_double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Long_Double_Box_relation_with_congruence :
  long_double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Long_Double_Box_get_constraints :
  long_double_box -> constraint_system
val ppl_Long_Double_Box_get_congruences :
  long_double_box -> congruence_system
val ppl_Long_Double_Box_get_minimized_constraints :
  long_double_box -> constraint_system
val ppl_Long_Double_Box_get_minimized_congruences :
  long_double_box -> congruence_system
val ppl_Long_Double_Box_is_empty : long_double_box -> bool
val ppl_Long_Double_Box_is_universe : long_double_box -> bool
val ppl_Long_Double_Box_is_bounded : long_double_box -> bool
val ppl_Long_Double_Box_contains_integer_point : long_double_box -> bool
val ppl_Long_Double_Box_is_topologically_closed : long_double_box -> bool
val ppl_Long_Double_Box_is_discrete : long_double_box -> bool
val ppl_Long_Double_Box_topological_closure_assign : long_double_box -> unit
val ppl_Long_Double_Box_bounds_from_above :
  long_double_box -> linear_expression -> bool
val ppl_Long_Double_Box_bounds_from_below :
  long_double_box -> linear_expression -> bool
val ppl_Long_Double_Box_maximize :
  long_double_box ->
```

```
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Long_Double_Box_minimize :
  long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Long_Double_Box_maximize_with_point :
  long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Long_Double_Box_minimize_with_point :
  long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Long_Double_Box_frequency :
  long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Long_Double_Box_contains_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_strictly_contains_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_is_disjoint_from_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_equals_Long_Double_Box :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_OK : long_double_box -> bool
val ppl_Long_Double_Box_add_constraint :
  long_double_box -> linear_constraint -> unit
val ppl_Long_Double_Box_add_congruence :
  long_double_box -> linear_congruence -> unit
val ppl_Long_Double_Box_add_constraints :
  long_double_box -> constraint_system -> unit
val ppl_Long_Double_Box_add_congruences :
  long_double_box -> congruence_system -> unit
val ppl_Long_Double_Box_refine_with_constraint :
  long_double_box -> linear_constraint -> unit
val ppl_Long_Double_Box_refine_with_congruence :
  long_double_box -> linear_congruence -> unit
val ppl_Long_Double_Box_refine_with_constraints :
  long_double_box -> constraint_system -> unit
val ppl_Long_Double_Box_refine_with_congruences :
  long_double_box -> congruence_system -> unit
val ppl_Long_Double_Box_intersection_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_upper_bound_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_difference_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_concatenate_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_time_elapse_assign :
```

```
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_upper_bound_assign_if_exact :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_simplify_using_context_assign :
  long_double_box -> long_double_box -> bool
val ppl_Long_Double_Box_constrains : long_double_box -> int -> bool
val ppl_Long_Double_Box_unconstrain_space_dimension :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_unconstrain_space_dimensions :
  long_double_box -> int list -> unit
val ppl_Long_Double_Box_affine_image :
  long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_affine_preimage :
  long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_bounded_affine_image :
  long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_bounded_affine_preimage :
  long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_generalized_affine_image :
  long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_generalized_affine_preimage :
  long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Long_Double_Box_generalized_affine_image_lhs_rhs :
  long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Long_Double_Box_generalized_affine_preimage_lhs_rhs :
  long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Long_Double_Box_add_space_dimensions_and_embed :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_add_space_dimensions_and_project :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_remove_space_dimensions :
  long_double_box -> int list -> unit
val ppl_Long_Double_Box_remove_higher_space_dimensions :
  long_double_box -> int -> unit
val ppl_Long_Double_Box_expand_space_dimension :
  long_double_box -> int -> int -> unit
```

```
val ppl_Long_Double_Box_fold_space_dimensions :
  long_double_box -> int list -> int -> unit
val ppl_Long_Double_Box_map_space_dimensions :
  long_double_box -> (int * int) list -> unit
val ppl_Long_Double_Box_drop_some_non_integer_points :
  long_double_box -> complexity_class -> unit
val ppl_Long_Double_Box_drop_some_non_integer_points_2 :
  long_double_box -> int list -> complexity_class -> unit
val ppl_Long_Double_Box_ascii_dump : long_double_box -> string
val ppl_Long_Double_Box_external_memory_in_bytes : long_double_box -> int
val ppl_Long_Double_Box_total_memory_in_bytes : long_double_box -> int
val ppl_Long_Double_Box_CC76_widening_assign_with_tokens :
  long_double_box -> long_double_box -> int -> int
val ppl_Long_Double_Box_CC76_widening_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_widening_assign_with_tokens :
  long_double_box -> long_double_box -> int -> int
val ppl_Long_Double_Box_widening_assign :
  long_double_box -> long_double_box -> unit
val ppl_Long_Double_Box_limited_CC76_extrapolation_assign_with_tokens :
  long_double_box ->
  long_double_box -> constraint_system -> int -> int
val ppl_Long_Double_Box_limited_CC76_extrapolation_assign :
  long_double_box ->
  long_double_box -> constraint_system -> unit
val ppl_Long_Double_Box_linear_partition :
  long_double_box ->
  long_double_box ->
  long_double_box * pointset_powerset_nnc_polyhedron
val ppl_Long_Double_Box_wrap_assign :
  long_double_box ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Long_Double_Box : long_double_box -> bool
val ppl_termination_test_PR_Long_Double_Box : long_double_box -> bool
val ppl_one_affine_ranking_function_MS_Long_Double_Box :
  long_double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Long_Double_Box :
  long_double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Long_Double_Box :
  long_double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Long_Double_Box :
  long_double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box :
  long_double_box -> polyhedron * polyhedron
val ppl_termination_test_MS_Long_Double_Box_2 :
```

```
  long_double_box -> long_double_box -> bool
val ppl_termination_test_PR_Long_Double_Box_2 :
  long_double_box -> long_double_box -> bool
val ppl_one_affine_ranking_function_MS_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> polyhedron
val ppl_all_affine_ranking_functions_PR_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Long_Double_Box_2 :
  long_double_box ->
  long_double_box -> polyhedron * polyhedron
val ppl_new_BD_Shape_long_double_from_space_dimension :
  int -> degenerate_element -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int8_Box :
  int8_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int16_Box :
  int16_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int32_Box :
  int32_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int64_Box :
  int64_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint8_Box :
  uint8_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint16_Box :
  uint16_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint32_Box :
  uint32_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint64_Box :
  uint64_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Z_Box : z_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Rational_Box :
  rational_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> bd_shape_long_double
```

```
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_C_Polyhedron :
  polyhedron -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_NNC_Polyhedron :
  polyhedron -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Grid : grid -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Float_Box :
  float_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_float :
  bd_shape_float -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Double_Box :
  double_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_double :
  bd_shape_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_double :
  octagonal_shape_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Long_Double_Box :
  long_double_box -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> bd_shape_long_double
```

```
val ppl_new_BD_Shape_long_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int16_t_with_complexity :
  octagonal_shape_int16_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int32_t_with_complexity :
  octagonal_shape_int32_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_int64_t_with_complexity :
  octagonal_shape_int64_t ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpz_class_with_complexity :
  octagonal_shape_mpz_class ->
```

```
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_mpq_class_with_complexity :
  octagonal_shape_mpq_class ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Grid_with_complexity :
  grid ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_Octagonal_Shape_long_double_with_complexity :
  octagonal_shape_long_double ->
  complexity_class -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_constraints :
  constraint_system -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_congruences :
  congruence_system -> bd_shape_long_double
val ppl_new_BD_Shape_long_double_from_generators :
  generator_system -> bd_shape_long_double
val ppl_BD_Shape_long_double_swap :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_space_dimension : bd_shape_long_double -> int
```

```
val ppl_BD_Shape_long_double_affine_dimension : bd_shape_long_double -> int
val ppl_BD_Shape_long_double_relation_with_constraint :
  bd_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_BD_Shape_long_double_relation_with_generator :
  bd_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_BD_Shape_long_double_relation_with_congruence :
  bd_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_BD_Shape_long_double_get_constraints :
  bd_shape_long_double -> constraint_system
val ppl_BD_Shape_long_double_get_congruences :
  bd_shape_long_double -> congruence_system
val ppl_BD_Shape_long_double_get_minimized_constraints :
  bd_shape_long_double -> constraint_system
val ppl_BD_Shape_long_double_get_minimized_congruences :
  bd_shape_long_double -> congruence_system
val ppl_BD_Shape_long_double_is_empty : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_universe : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_bounded : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_contains_integer_point :
  bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_topologically_closed :
  bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_discrete : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_topological_closure_assign :
  bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_bounds_from_above :
  bd_shape_long_double -> linear_expression -> bool
val ppl_BD_Shape_long_double_bounds_from_below :
  bd_shape_long_double -> linear_expression -> bool
val ppl_BD_Shape_long_double_maximize :
  bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_long_double_minimize :
  bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_BD_Shape_long_double_maximize_with_point :
  bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_long_double_minimize_with_point :
  bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_BD_Shape_long_double_frequency :
  bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
```

```
val ppl_BD_Shape_long_double_contains_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_strictly_contains_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_is_disjoint_from_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_equals_BD_Shape_long_double :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_OK : bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_add_constraint :
  bd_shape_long_double -> linear_constraint -> unit
val ppl_BD_Shape_long_double_add_congruence :
  bd_shape_long_double -> linear_congruence -> unit
val ppl_BD_Shape_long_double_add_constraints :
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_add_congruences :
  bd_shape_long_double -> congruence_system -> unit
val ppl_BD_Shape_long_double_refine_with_constraint :
  bd_shape_long_double -> linear_constraint -> unit
val ppl_BD_Shape_long_double_refine_with_congruence :
  bd_shape_long_double -> linear_congruence -> unit
val ppl_BD_Shape_long_double_refine_with_constraints :
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_refine_with_congruences :
  bd_shape_long_double -> congruence_system -> unit
val ppl_BD_Shape_long_double_intersection_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_upper_bound_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_difference_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_concatenate_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_time_elapse_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_upper_bound_assign_if_exact :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_simplify_using_context_assign :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_BD_Shape_long_double_constrains : bd_shape_long_double -> int -> bool
val ppl_BD_Shape_long_double_unconstrain_space_dimension :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_unconstrain_space_dimensions :
  bd_shape_long_double -> int list -> unit
val ppl_BD_Shape_long_double_affine_image :
  bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_affine_preimage :
```

```
  bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_bounded_affine_image :
  bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_bounded_affine_preimage :
  bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_generalized_affine_image :
  bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_generalized_affine_preimage :
  bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_BD_Shape_long_double_generalized_affine_image_lhs_rhs :
  bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_long_double_generalized_affine_preimage_lhs_rhs :
  bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_BD_Shape_long_double_add_space_dimensions_and_embed :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_add_space_dimensions_and_project :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_remove_space_dimensions :
  bd_shape_long_double -> int list -> unit
val ppl_BD_Shape_long_double_remove_higher_space_dimensions :
  bd_shape_long_double -> int -> unit
val ppl_BD_Shape_long_double_expand_space_dimension :
  bd_shape_long_double -> int -> int -> unit
val ppl_BD_Shape_long_double_fold_space_dimensions :
  bd_shape_long_double -> int list -> int -> unit
val ppl_BD_Shape_long_double_map_space_dimensions :
  bd_shape_long_double -> (int * int) list -> unit
val ppl_BD_Shape_long_double_drop_some_non_integer_points :
  bd_shape_long_double -> complexity_class -> unit
val ppl_BD_Shape_long_double_drop_some_non_integer_points_2 :
  bd_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_BD_Shape_long_double_ascii_dump : bd_shape_long_double -> string
val ppl_BD_Shape_long_double_external_memory_in_bytes :
  bd_shape_long_double -> int
val ppl_BD_Shape_long_double_total_memory_in_bytes :
  bd_shape_long_double -> int
```

```
val ppl_BD_Shape_long_double_BHMZ05_widening_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_H79_widening_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_BHMZ05_widening_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_H79_widening_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_widening_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_widening_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> int -> int
val ppl_BD_Shape_long_double_limited_H79_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> int -> int
val ppl_BD_Shape_long_double_limited_CC76_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> int -> int
val ppl_BD_Shape_long_double_limited_BHMZ05_extrapolation_assign :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_limited_H79_extrapolation_assign :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_limited_CC76_extrapolation_assign :
  bd_shape_long_double ->
  bd_shape_long_double -> constraint_system -> unit
val ppl_BD_Shape_long_double_CC76_extrapolation_assign_with_tokens :
  bd_shape_long_double ->
  bd_shape_long_double -> int -> int
val ppl_BD_Shape_long_double_CC76_extrapolation_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_CC76_narrowing_assign :
  bd_shape_long_double -> bd_shape_long_double -> unit
val ppl_BD_Shape_long_double_linear_partition :
  bd_shape_long_double ->
  bd_shape_long_double ->
  bd_shape_long_double * pointset_powerset_nnc_polyhedron
val ppl_BD_Shape_long_double_wrap_assign :
  bd_shape_long_double ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
```

```
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_BD_Shape_long_double :
  bd_shape_long_double -> bool
val ppl_termination_test_PR_BD_Shape_long_double :
  bd_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_long_double :
  bd_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_long_double :
  bd_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_long_double :
  bd_shape_long_double -> polyhedron * polyhedron
val ppl_termination_test_MS_BD_Shape_long_double_2 :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_termination_test_PR_BD_Shape_long_double_2 :
  bd_shape_long_double -> bd_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_BD_Shape_long_double_2 :
  bd_shape_long_double ->
  bd_shape_long_double -> polyhedron * polyhedron
val ppl_new_Octagonal_Shape_long_double_from_space_dimension :
  int -> degenerate_element -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int8_Box :
  int8_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int16_Box :
  int16_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int32_Box :
  int32_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int64_Box :
  int64_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint8_Box :
  uint8_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint16_Box :
  uint16_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint32_Box :
```

```
  uint32_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint64_Box :
  uint64_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Z_Box :
  z_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Rational_Box :
  rational_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int8_t :
  bd_shape_int8_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int16_t :
  bd_shape_int16_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int32_t :
  bd_shape_int32_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int64_t :
  bd_shape_int64_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpz_class :
  bd_shape_mpz_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpq_class :
  bd_shape_mpq_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int8_t :
  octagonal_shape_int8_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int16_t :
  octagonal_shape_int16_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int32_t :
  octagonal_shape_int32_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int64_t :
  octagonal_shape_int64_t -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpz_class :
  octagonal_shape_mpz_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpq_class :
  octagonal_shape_mpq_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_C_Polyhedron :
  polyhedron -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_NNC_Polyhedron :
  polyhedron -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Grid :
  grid -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Float_Box :
  float_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_float :
  bd_shape_float -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_float :
  octagonal_shape_float -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Double_Box :
  double_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_double :
  bd_shape_double -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_double :
```

```
  octagonal_shape_double -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Long_Double_Box :
  long_double_box -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_long_double :
  bd_shape_long_double -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int8_Box_with_complexity :
  int8_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int16_Box_with_complexity :
  int16_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int32_Box_with_complexity :
  int32_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Int64_Box_with_complexity :
  int64_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint8_Box_with_complexity :
  uint8_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint16_Box_with_complexity :
  uint16_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint32_Box_with_complexity :
  uint32_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Uint64_Box_with_complexity :
  uint64_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Z_Box_with_complexity :
  z_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Rational_Box_with_complexity :
  rational_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int8_t_with_complexity :
  bd_shape_int8_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int16_t_with_complexity :
  bd_shape_int16_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int32_t_with_complexity :
  bd_shape_int32_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_int64_t_with_complexity :
  bd_shape_int64_t ->
  complexity_class -> octagonal_shape_long_double
```

```
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpz_class_with_complexity :
  bd_shape_mpz_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_mpq_class_with_complexity :
  bd_shape_mpq_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int8_t_with_complexity :
  octagonal_shape_int8_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int16_t_with_complexity
  octagonal_shape_int16_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int32_t_with_complexity
  octagonal_shape_int32_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_int64_t_with_complexity
  octagonal_shape_int64_t ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpz_class_with_complexit
  octagonal_shape_mpz_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_mpq_class_with_complexit
  octagonal_shape_mpq_class ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_C_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_NNC_Polyhedron_with_complexity :
  polyhedron ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Grid_with_complexity :
  grid ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Float_Box_with_complexity :
  float_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_float_with_complexity :
  bd_shape_float ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_float_with_complexity :
  octagonal_shape_float ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Double_Box_with_complexity :
  double_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_double_with_complexity :
  bd_shape_double ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_double_with_complexity :
  octagonal_shape_double ->
```

```
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_BD_Shape_long_double_with_complexity :
  bd_shape_long_double ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_Octagonal_Shape_long_double_with_complex
  octagonal_shape_long_double ->
  complexity_class -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_constraints :
  constraint_system -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_congruences :
  congruence_system -> octagonal_shape_long_double
val ppl_new_Octagonal_Shape_long_double_from_generators :
  generator_system -> octagonal_shape_long_double
val ppl_Octagonal_Shape_long_double_swap :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_space_dimension :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_affine_dimension :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_relation_with_constraint :
  octagonal_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_Octagonal_Shape_long_double_relation_with_generator :
  octagonal_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_Octagonal_Shape_long_double_relation_with_congruence :
  octagonal_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_Octagonal_Shape_long_double_get_constraints :
  octagonal_shape_long_double -> constraint_system
val ppl_Octagonal_Shape_long_double_get_congruences :
  octagonal_shape_long_double -> congruence_system
val ppl_Octagonal_Shape_long_double_get_minimized_constraints :
  octagonal_shape_long_double -> constraint_system
val ppl_Octagonal_Shape_long_double_get_minimized_congruences :
  octagonal_shape_long_double -> congruence_system
val ppl_Octagonal_Shape_long_double_is_empty :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_universe :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_bounded :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_contains_integer_point :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_topologically_closed :
```

```
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_discrete :
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_topological_closure_assign :
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_bounds_from_above :
  octagonal_shape_long_double -> linear_expression -> bool
val ppl_Octagonal_Shape_long_double_bounds_from_below :
  octagonal_shape_long_double -> linear_expression -> bool
val ppl_Octagonal_Shape_long_double_maximize :
  octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_long_double_minimize :
  octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Octagonal_Shape_long_double_maximize_with_point :
  octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_long_double_minimize_with_point :
  octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Octagonal_Shape_long_double_frequency :
  octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t * Gmp.Z.t
val ppl_Octagonal_Shape_long_double_contains_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_strictly_contains_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_is_disjoint_from_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_equals_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_OK : octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_add_constraint :
  octagonal_shape_long_double -> linear_constraint -> unit
val ppl_Octagonal_Shape_long_double_add_congruence :
  octagonal_shape_long_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_long_double_add_constraints :
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_add_congruences :
  octagonal_shape_long_double -> congruence_system -> unit
val ppl_Octagonal_Shape_long_double_refine_with_constraint :
  octagonal_shape_long_double -> linear_constraint -> unit
```

```
val ppl_Octagonal_Shape_long_double_refine_with_congruence :
  octagonal_shape_long_double -> linear_congruence -> unit
val ppl_Octagonal_Shape_long_double_refine_with_constraints :
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_refine_with_congruences :
  octagonal_shape_long_double -> congruence_system -> unit
val ppl_Octagonal_Shape_long_double_intersection_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_upper_bound_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_difference_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_concatenate_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_time_elapse_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_upper_bound_assign_if_exact :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_simplify_using_context_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_Octagonal_Shape_long_double_constrains :
  octagonal_shape_long_double -> int -> bool
val ppl_Octagonal_Shape_long_double_unconstrain_space_dimension :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_unconstrain_space_dimensions :
  octagonal_shape_long_double -> int list -> unit
val ppl_Octagonal_Shape_long_double_affine_image :
  octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_affine_preimage :
  octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_bounded_affine_image :
  octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_bounded_affine_preimage :
  octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_image :
  octagonal_shape_long_double ->
  int ->
```

```
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_preimage :
  octagonal_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_image_lhs_rhs :
  octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_long_double_generalized_affine_preimage_lhs_rhs :
  octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Octagonal_Shape_long_double_add_space_dimensions_and_embed :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_add_space_dimensions_and_project :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_remove_space_dimensions :
  octagonal_shape_long_double -> int list -> unit
val ppl_Octagonal_Shape_long_double_remove_higher_space_dimensions :
  octagonal_shape_long_double -> int -> unit
val ppl_Octagonal_Shape_long_double_expand_space_dimension :
  octagonal_shape_long_double -> int -> int -> unit
val ppl_Octagonal_Shape_long_double_fold_space_dimensions :
  octagonal_shape_long_double -> int list -> int -> unit
val ppl_Octagonal_Shape_long_double_map_space_dimensions :
  octagonal_shape_long_double -> (int * int) list -> unit
val ppl_Octagonal_Shape_long_double_drop_some_non_integer_points :
  octagonal_shape_long_double -> complexity_class -> unit
val ppl_Octagonal_Shape_long_double_drop_some_non_integer_points_2 :
  octagonal_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_Octagonal_Shape_long_double_ascii_dump :
  octagonal_shape_long_double -> string
val ppl_Octagonal_Shape_long_double_external_memory_in_bytes :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_total_memory_in_bytes :
  octagonal_shape_long_double -> int
val ppl_Octagonal_Shape_long_double_BHMZ05_widening_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> int -> int
val ppl_Octagonal_Shape_long_double_BHMZ05_widening_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_widening_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> int -> int
val ppl_Octagonal_Shape_long_double_widening_assign :
  octagonal_shape_long_double ->
```

```
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_limited_BHMZ05_extrapolation_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_long_double_limited_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  constraint_system -> int -> int
val ppl_Octagonal_Shape_long_double_limited_BHMZ05_extrapolation_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_limited_CC76_extrapolation_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> constraint_system -> unit
val ppl_Octagonal_Shape_long_double_CC76_extrapolation_assign_with_tokens :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> int -> int
val ppl_Octagonal_Shape_long_double_CC76_extrapolation_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_CC76_narrowing_assign :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Octagonal_Shape_long_double_linear_partition :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  octagonal_shape_long_double *
  pointset_powerset_nnc_polyhedron
val ppl_Octagonal_Shape_long_double_wrap_assign :
  octagonal_shape_long_double ->
  int list ->
  bounded_integer_type_width ->
  bounded_integer_type_representation ->
  bounded_integer_type_overflow ->
  constraint_system -> int -> int -> unit
val ppl_termination_test_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_long_double :
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_long_double :
  octagonal_shape_long_double ->
```

```
  polyhedron * polyhedron
val ppl_termination_test_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_termination_test_PR_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool
val ppl_one_affine_ranking_function_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool * linear_generator
val ppl_one_affine_ranking_function_PR_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> bool * linear_generator
val ppl_all_affine_ranking_functions_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_ranking_functions_PR_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double -> polyhedron
val ppl_all_affine_quasi_ranking_functions_MS_Octagonal_Shape_long_double_2 :
  octagonal_shape_long_double ->
  octagonal_shape_long_double ->
  polyhedron * polyhedron
val ppl_new_Pointset_Powerset_Long_Double_Box_from_space_dimension :
  int ->
  degenerate_element -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Pointset_Powerset_Long_Double_Box
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Long_Double_Box :
  long_double_box -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Pointset_Powerset_Long_Double_Box_
  pointset_powerset_long_double_box ->
  complexity_class -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_Long_Double_Box_with_complexity :
  long_double_box ->
  complexity_class -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_constraints :
  constraint_system -> pointset_powerset_long_double_box
val ppl_new_Pointset_Powerset_Long_Double_Box_from_congruences :
  congruence_system -> pointset_powerset_long_double_box
val ppl_Pointset_Powerset_Long_Double_Box_swap :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_space_dimension :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_affine_dimension :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_relation_with_constraint :
  pointset_powerset_long_double_box ->
```

```
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Long_Double_Box_relation_with_generator :
  pointset_powerset_long_double_box ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Long_Double_Box_relation_with_congruence :
  pointset_powerset_long_double_box ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Long_Double_Box_is_empty :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_universe :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_bounded :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_contains_integer_point :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_topologically_closed :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_discrete :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_topological_closure_assign :
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_pairwise_reduce :
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_omega_reduce :
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_bounds_from_above :
  pointset_powerset_long_double_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Long_Double_Box_bounds_from_below :
  pointset_powerset_long_double_box ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Long_Double_Box_maximize :
  pointset_powerset_long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Long_Double_Box_minimize :
  pointset_powerset_long_double_box ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Long_Double_Box_maximize_with_point :
  pointset_powerset_long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Long_Double_Box_minimize_with_point :
  pointset_powerset_long_double_box ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Long_Double_Box_contains_Pointset_Powerset_Long_Double_Box
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_strictly_contains_Pointset_Powerset_Long_Do
```

```
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_is_disjoint_from_Pointset_Powerset_Long_Dou
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_geometrically_covers_Pointset_Powerset_Long
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_geometrically_equals_Pointset_Powerset_Long
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_equals_Pointset_Powerset_Long_Double_Box :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_OK :
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_add_constraint :
  pointset_powerset_long_double_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_congruence :
  pointset_powerset_long_double_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_constraints :
  pointset_powerset_long_double_box ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_congruences :
  pointset_powerset_long_double_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_constraint :
  pointset_powerset_long_double_box ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_congruence :
  pointset_powerset_long_double_box ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_constraints :
  pointset_powerset_long_double_box ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_refine_with_congruences :
  pointset_powerset_long_double_box ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Long_Double_Box_intersection_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_upper_bound_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_difference_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_concatenate_assign :
```

```
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_time_elapse_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_upper_bound_assign_if_exact :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_simplify_using_context_assign :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box -> bool
val ppl_Pointset_Powerset_Long_Double_Box_constrains :
  pointset_powerset_long_double_box -> int -> bool
val ppl_Pointset_Powerset_Long_Double_Box_unconstrain_space_dimension :
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_unconstrain_space_dimensions :
  pointset_powerset_long_double_box -> int list -> unit
val ppl_Pointset_Powerset_Long_Double_Box_affine_image :
  pointset_powerset_long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_affine_preimage :
  pointset_powerset_long_double_box ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_bounded_affine_image :
  pointset_powerset_long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_bounded_affine_preimage :
  pointset_powerset_long_double_box ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_image :
  pointset_powerset_long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_preimage :
  pointset_powerset_long_double_box ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_image_lhs_rhs :
  pointset_powerset_long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Long_Double_Box_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_long_double_box ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_space_dimensions_and_embed :
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_add_space_dimensions_and_project :
```

```
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_remove_space_dimensions :
  pointset_powerset_long_double_box -> int list -> unit
val ppl_Pointset_Powerset_Long_Double_Box_remove_higher_space_dimensions :
  pointset_powerset_long_double_box -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_expand_space_dimension :
  pointset_powerset_long_double_box -> int -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_fold_space_dimensions :
  pointset_powerset_long_double_box -> int list -> int -> unit
val ppl_Pointset_Powerset_Long_Double_Box_map_space_dimensions :
  pointset_powerset_long_double_box -> (int * int) list -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_some_non_integer_points :
  pointset_powerset_long_double_box ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_some_non_integer_points_2 :
  pointset_powerset_long_double_box ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Long_Double_Box_ascii_dump :
  pointset_powerset_long_double_box -> string
val ppl_Pointset_Powerset_Long_Double_Box_external_memory_in_bytes :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_total_memory_in_bytes :
  pointset_powerset_long_double_box -> int
val ppl_Pointset_Powerset_Long_Double_Box_size :
  pointset_powerset_long_double_box -> int
type pointset_powerset_long_double_box_iterator
val ppl_new_Pointset_Powerset_Long_Double_Box_iterator_from_iterator :
  pointset_powerset_long_double_box_iterator ->
  pointset_powerset_long_double_box_iterator
val ppl_Pointset_Powerset_Long_Double_Box_begin_iterator :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator
val ppl_Pointset_Powerset_Long_Double_Box_end_iterator :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator
val ppl_Pointset_Powerset_Long_Double_Box_iterator_equals_iterator :
  pointset_powerset_long_double_box_iterator ->
  pointset_powerset_long_double_box_iterator -> bool
val ppl_Pointset_Powerset_Long_Double_Box_increment_iterator :
  pointset_powerset_long_double_box_iterator -> unit
val ppl_Pointset_Powerset_Long_Double_Box_decrement_iterator :
  pointset_powerset_long_double_box_iterator -> unit
val ppl_Pointset_Powerset_Long_Double_Box_get_disjunct :
  pointset_powerset_long_double_box_iterator ->
  long_double_box
val ppl_Pointset_Powerset_Long_Double_Box_add_disjunct :
  pointset_powerset_long_double_box ->
  long_double_box -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_disjunct :
```

```
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator -> unit
val ppl_Pointset_Powerset_Long_Double_Box_drop_disjuncts :
  pointset_powerset_long_double_box ->
  pointset_powerset_long_double_box_iterator ->
  pointset_powerset_long_double_box_iterator -> unit
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_Pointset_Powerset_BD_Shape_lo
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_BD_Shape_long_double :
  bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_Pointset_Powerset_BD_Shape_lo
  pointset_powerset_bd_shape_long_double ->
  complexity_class ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_BD_Shape_long_double_with_com
  bd_shape_long_double ->
  complexity_class ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_constraints :
  constraint_system ->
  pointset_powerset_bd_shape_long_double
val ppl_new_Pointset_Powerset_BD_Shape_long_double_from_congruences :
  congruence_system ->
  pointset_powerset_bd_shape_long_double
val ppl_Pointset_Powerset_BD_Shape_long_double_swap :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_space_dimension :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_affine_dimension :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_constraint :
  pointset_powerset_bd_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_generator :
  pointset_powerset_bd_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_BD_Shape_long_double_relation_with_congruence :
  pointset_powerset_bd_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_BD_Shape_long_double_is_empty :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_universe :
  pointset_powerset_bd_shape_long_double -> bool
```

```
val ppl_Pointset_Powerset_BD_Shape_long_double_is_bounded :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_contains_integer_point :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_topologically_closed :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_discrete :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_topological_closure_assign :
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_pairwise_reduce :
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_omega_reduce :
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_bounds_from_above :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_bounds_from_below :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_maximize :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_long_double_minimize :
  pointset_powerset_bd_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_BD_Shape_long_double_maximize_with_point :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_long_double_minimize_with_point :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_BD_Shape_long_double_contains_Pointset_Powerset_BD_Shape_lo
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_strictly_contains_Pointset_Powerset_BD
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_is_disjoint_from_Pointset_Powerset_BD_
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_geometrically_covers_Pointset_Powerset
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_geometrically_equals_Pointset_Powerset
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_equals_Pointset_Powerset_BD_Shape_long
```

```
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_OK :
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_add_constraint :
  pointset_powerset_bd_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_congruence :
  pointset_powerset_bd_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_constraints :
  pointset_powerset_bd_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_congruences :
  pointset_powerset_bd_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_constraint :
  pointset_powerset_bd_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_congruence :
  pointset_powerset_bd_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_constraints :
  pointset_powerset_bd_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_refine_with_congruences :
  pointset_powerset_bd_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_intersection_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_upper_bound_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_difference_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_concatenate_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_time_elapse_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_upper_bound_assign_if_exact :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_simplify_using_context_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_constrains :
```

```
  pointset_powerset_bd_shape_long_double -> int -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_unconstrain_space_dimension :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_unconstrain_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_affine_image :
  pointset_powerset_bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_affine_preimage :
  pointset_powerset_bd_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_bounded_affine_image :
  pointset_powerset_bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_bounded_affine_preimage :
  pointset_powerset_bd_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_image :
  pointset_powerset_bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_preimage :
  pointset_powerset_bd_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_image_lhs_rhs :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_generalized_affine_preimage_lhs_rhs :
  pointset_powerset_bd_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_space_dimensions_and_embed :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_add_space_dimensions_and_project :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_remove_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_remove_higher_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_expand_space_dimension :
  pointset_powerset_bd_shape_long_double -> int -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_fold_space_dimensions :
  pointset_powerset_bd_shape_long_double -> int list -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_map_space_dimensions :
  pointset_powerset_bd_shape_long_double -> (int * int) list -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_some_non_integer_points :
```

```
  pointset_powerset_bd_shape_long_double ->
  complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_some_non_integer_points_2 :
  pointset_powerset_bd_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_ascii_dump :
  pointset_powerset_bd_shape_long_double -> string
val ppl_Pointset_Powerset_BD_Shape_long_double_external_memory_in_bytes :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_total_memory_in_bytes :
  pointset_powerset_bd_shape_long_double -> int
val ppl_Pointset_Powerset_BD_Shape_long_double_size :
  pointset_powerset_bd_shape_long_double -> int
type pointset_powerset_bd_shape_long_double_iterator
val ppl_new_Pointset_Powerset_BD_Shape_long_double_iterator_from_iterator :
  pointset_powerset_bd_shape_long_double_iterator ->
  pointset_powerset_bd_shape_long_double_iterator
val ppl_Pointset_Powerset_BD_Shape_long_double_begin_iterator :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator
val ppl_Pointset_Powerset_BD_Shape_long_double_end_iterator :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator
val ppl_Pointset_Powerset_BD_Shape_long_double_iterator_equals_iterator :
  pointset_powerset_bd_shape_long_double_iterator ->
  pointset_powerset_bd_shape_long_double_iterator -> bool
val ppl_Pointset_Powerset_BD_Shape_long_double_increment_iterator :
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_decrement_iterator :
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_get_disjunct :
  pointset_powerset_bd_shape_long_double_iterator ->
  bd_shape_long_double
val ppl_Pointset_Powerset_BD_Shape_long_double_add_disjunct :
  pointset_powerset_bd_shape_long_double ->
  bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_disjunct :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_drop_disjuncts :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double_iterator ->
  pointset_powerset_bd_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_BHZ03_H79_BHMZ05_widening_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_BHZ03_H79_H79_widening_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> unit
```

```
val ppl_Pointset_Powerset_BD_Shape_long_double_BGP99_BHMZ05_extrapolation_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_BD_Shape_long_double_BGP99_H79_extrapolation_assign :
  pointset_powerset_bd_shape_long_double ->
  pointset_powerset_bd_shape_long_double -> int -> unit
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_space_dimension :
  int ->
  degenerate_element ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Pointset_Powerset_Octa
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Octagonal_Shape_long_d
  octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Pointset_Powerset_Octa
  pointset_powerset_octagonal_shape_long_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_Octagonal_Shape_long_d
  octagonal_shape_long_double ->
  complexity_class ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_constraints :
  constraint_system ->
  pointset_powerset_octagonal_shape_long_double
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_from_congruences :
  congruence_system ->
  pointset_powerset_octagonal_shape_long_double
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_swap :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_space_dimension :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_dimension :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_relation_with_constraint :
  pointset_powerset_octagonal_shape_long_double ->
  linear_constraint -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_relation_with_generator :
  pointset_powerset_octagonal_shape_long_double ->
  linear_generator -> poly_gen_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_relation_with_congruence :
  pointset_powerset_octagonal_shape_long_double ->
  linear_congruence -> poly_con_relation list
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_empty :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_universe :
  pointset_powerset_octagonal_shape_long_double -> bool
```

```
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_bounded :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_contains_integer_point :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_topologically_closed :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_discrete :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_topological_closure_assign :
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_pairwise_reduce :
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_omega_reduce :
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounds_from_above :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounds_from_below :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_maximize :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_minimize :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression -> bool * Gmp.Z.t * Gmp.Z.t * bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_maximize_with_point :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_minimize_with_point :
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  bool * Gmp.Z.t * Gmp.Z.t * bool * linear_generator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_contains_Pointset_Powerset_Octa
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_strictly_contains_Pointset_Powe
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_is_disjoint_from_Pointset_Power
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_geometrically_covers_Pointset_P
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_geometrically_equals_Pointset_P
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_equals_Pointset_Powerset_Octago
```

```
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_OK :
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_constraint :
  pointset_powerset_octagonal_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_congruence :
  pointset_powerset_octagonal_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_constraints :
  pointset_powerset_octagonal_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_congruences :
  pointset_powerset_octagonal_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_constraint :
  pointset_powerset_octagonal_shape_long_double ->
  linear_constraint -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_congruence :
  pointset_powerset_octagonal_shape_long_double ->
  linear_congruence -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_constraints :
  pointset_powerset_octagonal_shape_long_double ->
  constraint_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_refine_with_congruences :
  pointset_powerset_octagonal_shape_long_double ->
  congruence_system -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_intersection_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_upper_bound_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_difference_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_concatenate_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_time_elapse_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_upper_bound_assign_if_exact :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_simplify_using_context_assign :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_constrains :
```

```
  pointset_powerset_octagonal_shape_long_double -> int -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_unconstrain_space_dimension :
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_unconstrain_space_dimensions :
  pointset_powerset_octagonal_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_image :
  pointset_powerset_octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_affine_preimage :
  pointset_powerset_octagonal_shape_long_double ->
  int -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounded_affine_image :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_bounded_affine_preimage :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  linear_expression -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage :
  pointset_powerset_octagonal_shape_long_double ->
  int ->
  relation_symbol -> linear_expression -> Gmp.Z.t -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_image_lhs_rh
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_generalized_affine_preimage_lhs
  pointset_powerset_octagonal_shape_long_double ->
  linear_expression ->
  relation_symbol -> linear_expression -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_space_dimensions_and_embed
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_space_dimensions_and_projec
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_remove_space_dimensions :
  pointset_powerset_octagonal_shape_long_double -> int list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_remove_higher_space_dimensions
  pointset_powerset_octagonal_shape_long_double -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_expand_space_dimension :
  pointset_powerset_octagonal_shape_long_double -> int -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_fold_space_dimensions :
  pointset_powerset_octagonal_shape_long_double ->
  int list -> int -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_map_space_dimensions :
  pointset_powerset_octagonal_shape_long_double ->
```

```
  (int * int) list -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_some_non_integer_points :
  pointset_powerset_octagonal_shape_long_double ->
  complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_some_non_integer_points_2
  pointset_powerset_octagonal_shape_long_double ->
  int list -> complexity_class -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_ascii_dump :
  pointset_powerset_octagonal_shape_long_double -> string
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_external_memory_in_bytes :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_total_memory_in_bytes :
  pointset_powerset_octagonal_shape_long_double -> int
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_size :
  pointset_powerset_octagonal_shape_long_double -> int
type pointset_powerset_octagonal_shape_long_double_iterator
val ppl_new_Pointset_Powerset_Octagonal_Shape_long_double_iterator_from_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator ->
  pointset_powerset_octagonal_shape_long_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_begin_iterator :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_end_iterator :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_iterator_equals_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator ->
  pointset_powerset_octagonal_shape_long_double_iterator -> bool
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_increment_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_decrement_iterator :
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_get_disjunct :
  pointset_powerset_octagonal_shape_long_double_iterator ->
  octagonal_shape_long_double
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_add_disjunct :
  pointset_powerset_octagonal_shape_long_double ->
  octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjunct :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_drop_disjuncts :
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double_iterator ->
  pointset_powerset_octagonal_shape_long_double_iterator -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_BHZ03_H79_BHMZ05_widening_assig
  pointset_powerset_octagonal_shape_long_double ->
  pointset_powerset_octagonal_shape_long_double -> unit
val ppl_Pointset_Powerset_Octagonal_Shape_long_double_BGP99_BHMZ05_extrapolation_assi
```

```
pointset_powerset_octagonal_shape_long_double ->
pointset_powerset_octagonal_shape_long_double -> int -> unit
```

Compilation and Installation

When the Parma Polyhedra Library is configured, it tests for the existence of the OCaml system. If OCaml is correctly installed in a standard location, things are arranged so that the OCaml interface is built and installed.

3 GNU General Public License

Version 3, 29 June 2007

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5 Module Index

5.1 Modules

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6 Module Documentation

6.1 OCaml Language Interface

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