The Parma Polyhedra Library C Language Interface Developer'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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All the declarations needed for using the PPL's C interface (preprocessor symbols, data types, variables and functions) are collected in the header file `ppl_c.h`. This file, which is designed to work with pre-ANSI and ANSI C compilers as well as C99 and C++ compilers, should be included, either directly or via some other header file, with the directive

```
#include <ppl_c.h>
```

If this directive does not work, then your compiler is unable to find the file `ppl_c.h`. So check that the library is installed (if it is not installed, you may want to `make install`, perhaps with root privileges) in the right place (if not you may want to reconfigure the library using the appropriate pathname for the `--prefix` option); and that your compiler knows where it is installed (if not you should add the path to the directory where `ppl_c.h` is located to the compiler's include file search path; this is usually done with the `-I` option).

The name space of the PPL's C interface is `PPL_*` for preprocessor symbols, enumeration values and variables; and `ppl_*` for data types and function names. The interface systematically uses *opaque data types* (generic pointers that completely hide the internal representations from the client code) and provides all required access functions. By using just the interface, the client code can exploit all the functionalities of the library yet avoid directly manipulating the library's data structures. The advantages are that (1) applications do not depend on the internals of the library (these may change from release to release), and (2) the interface invariants can be thoroughly checked (by the access functions).

Note

> All functions taking as input argument an opaque pointer datatype assume that such an argument is actually *referring to a valid PPL object*. For instance, a function with an argument having type `ppl_MIP_Problem_t` will expect a valid MIP_Problem object, previously initialized by calling, e.g., `ppl_new_MIP_Problem`. If that is not the case (e.g., if a null pointer is passed in), the behavior is undefined.

The PPL's C interface is initialized by means of the `ppl_initialize` function. This function must be called *before using any other interface of the library*. The application can release the resources allocated by the library by calling the `ppl_finalize` function. After this function is called *no other interface of the library may be used* until the interface is re-initialized using `ppl_initialize`.

Any application using the PPL should make sure that only the intended version(s) of the library are ever used. The version used can be checked at compile-time thanks to the macros PPL_VERSION_MAJOR, PPL_VERSION_MINOR, PPL_VERSION_REVISION and PPL_VERSION_BETA, which give, respectively major, minor, revision and beta numbers of the PPL version. This is an example of their use:

```
#if PPL_VERSION_MAJOR == 0 && PPL_VERSION_MINOR < 6
```

```
# error "PPL version 0.6 or following is required"
#endif
```

Compile-time checking, however, is not normally enough, particularly in an environment where there is dynamic linking. Run-time checking can be performed by means of the functions `ppl_version_major`, `ppl_version_minor`, `ppl_version_revision`, and `ppl_version_beta`. The PPL's C interface also provides functions `ppl_version`, returning character string containing the full version number, and `ppl_banner`, returning a string that, in addition, provides (pointers to) other useful information for the library user.

All programs using the PPL's C interface must link with the following libraries: `libppl_c` (PPL's C interface), `libppl` (PPL's core), `libgmpxx` (GMP's C++ interface), and `libgmp` (GMP's library core). On most Unix-like systems, this is done by adding `-lppl_c`, `-lppl`, `-lgmpxx`, and `-lgmp` to the compiler's or linker's command line. For example:

```
gcc myprogram.o -lppl_c -lppl -lgmpxx -lgmp
```

If this does not work, it means that your compiler/linker is not finding the libraries where it expects. Again, this could be because you forgot to install the library or you installed it in a non-standard location. In the latter case you will need to use the appropriate options (usually `-L`) and, if you use shared libraries, some sort of run-time path selection mechanisms. Consult your compiler's documentation for details. Notice that the PPL is built using `Libtool` and an application can exploit this fact to significantly simplify the linking phase. See Libtool's documentation for details. Those working under Linux can find a lot of useful information on how to use program libraries (including static, shared, and dynamically loaded libraries) in the `Program Library HOWTO`.

For examples on how to use the functions provided by the C interface, you are referred to the directory `demos/ppl_lpsol/` in the source distribution. It contains a *Mixed Integer (Linear) Programming* solver written in C. In order to use this solver you will need to install `GLPK` (the GNU Linear Programming Kit): this is used to read linear programs in MPS format.

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Version 3, 29 June 2007

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4 Module Index

4.1 Modules

Here is a list of all modules:

5 Namespace Index

5.1 Namespace List

Here is a list of all namespaces with brief descriptions:

6 Class Index

6.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

7 File Index

7.1 File List

Here is a list of all files with brief descriptions:

8 Module Documentation

8.1 C Language Interface

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

8.2 Library Initialization and Finalization

Functions

- int ppl_initialize (void)

  Initializes the Parma Polyhedra Library. This function must be called before any other function.

- int ppl_finalize (void)

  Finalizes the Parma Polyhedra Library. This function must be called after any other function.

- int ppl_set_rounding_for_PPL (void)

  Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly.

- int ppl_restore_pre_PPL_rounding (void)

  Sets the FPU rounding mode as it was before initialization of the PPL.

- int ppl_irrational_precision (unsigned *p)

  Writes to `p` *the precision parameter used for irrational calculations.*

- int ppl_set_irrational_precision (unsigned p)

Sets the precision parameter used for irrational calculations.

8.2.1 Detailed Description

Functions for initialization/finalization of the library, as well as setting/resetting of floating-point rounding mode.

8.2.2 Function Documentation

8.2.2.1 int ppl_finalize (void)

Finalizes the Parma Polyhedra Library. This function must be called after any other function.

Returns

`PPL_ERROR_INVALID_ARGUMENT` if the library was already finalized.

Definition at line 243 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::saved_cxx_Variable_output_function.

8.2.2.2 int ppl_initialize (void)

Initializes the Parma Polyhedra Library. This function must be called before any other function.

Returns

`PPL_ERROR_INVALID_ARGUMENT` if the library was already initialized.

Definition at line 181 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::c_variable_default_output_function(), Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function, Parma_Polyhedra_Library::Interfaces::C::cxx_Variable_output_function(), and Parma_Polyhedra_Library::Interfaces::C::saved_cxx_Variable_output_function.

8.2.2.3 int ppl_irrational_precision (unsigned * *p*)

Writes to `p` the precision parameter used for irrational calculations.

Definition at line 328 of file ppl_c_implementation_common.cc.

8.2.2.4 int ppl_restore_pre_PPL_rounding (void)

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.

Definition at line 321 of file ppl_c_implementation_common.cc.

8.2.2.5 int ppl_set_irrational_precision (unsigned *p*)

Sets the precision parameter used for irrational calculations.

If `p` is less than or equal to `INT_MAX`, sets the precision parameter used for irrational calculations to `p`. Then, in the 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`.

Definition at line 335 of file ppl_c_implementation_common.cc.

8.2.2.6 int ppl_set_rounding_for_PPL (void)

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 been previously called.

Definition at line 314 of file ppl_c_implementation_common.cc.

8.3 Version Checking

Defines

- #define PPL_VERSION "0.11.2"

  A string containing the PPL version.

- #define PPL_VERSION_MAJOR 0

  The major number of the PPL version.

- #define PPL_VERSION_MINOR 11

  The minor number of the PPL version.

- #define PPL_VERSION_REVISION 2

  The revision number of the PPL version.

- #define PPL_VERSION_BETA 0

  The beta number of the PPL version. This is zero for official releases and nonzero for development snapshots.

Functions

- int ppl_version_major (void)

  Returns the major number of the PPL version.

- int ppl_version_minor (void)

  Returns the minor number of the PPL version.

- int ppl_version_revision (void)

  Returns the revision number of the PPL version.

- int ppl_version_beta (void)

  Returns the beta number of the PPL version.

- int ppl_version (const char **p)

  Writes to `*p` a pointer to a character string containing the PPL version.

- int ppl_banner (const char **p)

  Writes to `*p` a pointer to a character string containing the PPL banner.

8.3.1 Detailed Description

Symbolic constants and functions related to library version checking.

8.3.2 Define Documentation

8.3.2.1 #define PPL_VERSION "0.11.2"

A string containing the PPL version.

Let `M` and `m` denote the numbers associated to PPL_VERSION_MAJOR and PPL_VERSION_MINOR, respectively. The format of PPL_VERSION is `M "." m` if both PPL_VERSION_REVISION (`r`) and PPL_VERSION_BETA (`b`)are zero, `M "." m "pre" b` if PPL_VERSION_REVISION is zero and PPL_VERSION_BETA is not zero, `M "." m "." r` if PPL_VERSION_REVISION is not zero and PPL_VERSION_BETA is zero, `M "." m "." r "pre" b` if neither PPL_VERSION_REVISION nor PPL_VERSION_BETA are zero.

Definition at line 38 of file ppl_c_version.h.

8.3.2.2 #define PPL_VERSION_BETA 0

The beta number of the PPL version. This is zero for official releases and nonzero for development snapshots.

Definition at line 63 of file ppl_c_version.h.

8.3.2.3 #define PPL_VERSION_MAJOR 0

The major number of the PPL version.

Definition at line 44 of file ppl_c_version.h.

8.3.2.4 #define PPL_VERSION_MINOR 11

The minor number of the PPL version.

Definition at line 50 of file ppl_c_version.h.

8.3.2.5 #define PPL_VERSION_REVISION 2

The revision number of the PPL version.

Definition at line 56 of file ppl_c_version.h.

8.3.3 Function Documentation

8.3.3.1 int ppl_banner (const char ** *p*)

Writes to $*p$ a pointer to a character string containing the PPL banner.

The banner provides 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.

Definition at line 376 of file ppl_c_implementation_common.cc.

8.3.3.2 int ppl_version (const char ** *p*)

Writes to $*p$ a pointer to a character string containing the PPL version.

Definition at line 366 of file ppl_c_implementation_common.cc.

8.3.3.3 int ppl_version_beta (void)

Returns the beta number of the PPL version.

Definition at line 360 of file ppl_c_implementation_common.cc.

8.3.3.4 int ppl_version_major (void)

Returns the major number of the PPL version.

Definition at line 342 of file ppl_c_implementation_common.cc.

8.3.3.5 int ppl_version_minor (void)

Returns the minor number of the PPL version.

Definition at line 348 of file ppl_c_implementation_common.cc.

8.3.3.6 int ppl_version_revision (void)

Returns the revision number of the PPL version.

Definition at line 354 of file ppl_c_implementation_common.cc.

8.4 Error Handling

Enumerations

- enum ppl_enum_error_code {

  PPL_ERROR_OUT_OF_MEMORY, PPL_ERROR_INVALID_ARGUMENT, PPL_ERROR_-DOMAIN_ERROR, PPL_ERROR_LENGTH_ERROR,

  PPL_ARITHMETIC_OVERFLOW, PPL_STDIO_ERROR, PPL_ERROR_INTERNAL_ERROR, PPL_ERROR_UNKNOWN_STANDARD_EXCEPTION,

  PPL_ERROR_UNEXPECTED_ERROR, PPL_TIMEOUT_EXCEPTION, PPL_ERROR_LOGIC_-ERROR }

  Defines the error codes that any function may return.

Functions

- int ppl_set_error_handler (void(∗h)(enum ppl_enum_error_code code, const char ∗description))

  Installs the user-defined error handler pointed at by `h`.

8.4.1 Detailed Description

Symbolic constants and functions related to error reporting/handling.

8.4.2 Enumeration Type Documentation

8.4.2.1 enum ppl_enum_error_code

Defines the error codes that any function may return.

Enumerator:

PPL_ERROR_OUT_OF_MEMORY The virtual memory available to the process has been exhausted.

PPL_ERROR_INVALID_ARGUMENT A function has been invoked with an invalid argument.

PPL_ERROR_DOMAIN_ERROR A function has been invoked outside its domain of definition.

PPL_ERROR_LENGTH_ERROR The construction of an object that would exceed its maximum permitted size was attempted.

PPL_ARITHMETIC_OVERFLOW An arithmetic overflow occurred and the computation was consequently interrupted. This can *only* happen in library's incarnations using bounded integers as coefficients.

PPL_STDIO_ERROR An error occurred during a C input/output operation. A more precise indication of what went wrong is available via `errno`.

PPL_ERROR_INTERNAL_ERROR An internal error that was diagnosed by the PPL itself. This indicates a bug in the PPL.

PPL_ERROR_UNKNOWN_STANDARD_EXCEPTION A standard exception has been raised by the C++ run-time environment. This indicates a bug in the PPL.

PPL_ERROR_UNEXPECTED_ERROR A totally unknown, totally unexpected error happened. This indicates a bug in the PPL.

PPL_TIMEOUT_EXCEPTION An exception has been raised by the PPL as a timeout previously set by the user has expired.

PPL_ERROR_LOGIC_ERROR The client program attempted to use the PPL in a way that violates its internal logic. This happens, for instance, when the client attempts to use the timeout facilities on a system that does not support them.

Definition at line 298 of file ppl_c_header.h.

8.4.3 Function Documentation

8.4.3.1 int ppl_set_error_handler (void(∗)(enum ppl_enum_error_code code, const char ∗description) *h*)

Installs the user-defined error handler pointed at by `h`.

The error handler takes an error code and a textual description that gives further information about the actual error. The C string containing the textual description is read-only and its existence is not guaranteed after the handler has returned.

8.5 Handling

Functions

- int ppl_set_timeout (unsigned time)

  Sets the timeout for computations whose completion could require an exponential amount of time.

- int ppl_reset_timeout (void)

  Resets the timeout time so that the computation is not interrupted.

- int ppl_set_deterministic_timeout (unsigned weight)

  Sets a threshold for computations whose completion could require an exponential amount of time.

- int ppl_reset_deterministic_timeout (void)

  Resets the deterministic timeout so that the computation is not interrupted.

8.5.1 Detailed Description

Functions for setting and resetting timeouts.

8.5.2 Function Documentation

8.5.2.1 int ppl_reset_deterministic_timeout (void)

Resets the deterministic timeout so that the computation is not interrupted.

Definition at line 301 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reset_deterministic_timeout().

8.5.2.2 int ppl_reset_timeout (void)

Resets the timeout time so that the computation is not interrupted.

Definition at line 270 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reset_timeout().

8.5.2.3 int ppl_set_deterministic_timeout (unsigned *weight*)

Sets a threshold for computations whose completion could require an exponential amount of time.

Parameters

weight The maximum computational weight allowed. It must be strictly greater than zero.

Computations taking exponential time will be interrupted some time after reaching the `weight` complexity threshold. If the computation is interrupted that way, the interrupted function will return error code `PPL_TIMEOUT_EXCEPTION`. Otherwise, if the computation completes without being interrupted, then the deterministic timeout should be reset by calling `ppl_reset_deterministic_timeout()`.

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.).

Warning

The weight mechanism is under alpha testing. In particular, there is still no clear relation between the weight threshold and the actual computational complexity. As a consequence, client applications should be ready to reconsider the tuning of these weight thresholds when upgrading to newer version of the PPL.

Definition at line 283 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reset_deterministic_timeout().

8.5.2.4 int ppl_set_timeout (unsigned *time*)

Sets the timeout for computations whose completion could require an exponential amount of time.

Parameters

time The number of hundreths of seconds. It must be strictly greater than zero.

Computations taking exponential time will be interrupted some time after `time` hundreths of seconds have elapsed since the call to the timeout setting function. If the computation is interrupted that way, the interrupted function will return error code `PPL_TIMEOUT_EXCEPTION`. Otherwise, if the computation completes without being interrupted, then the timeout should be reset by calling `ppl_reset_timeout()`.

Definition at line 252 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reset_timeout().

8.6 Library Datatypes

Typedefs for the library datatypes and related symbolic constants.

Typedefs

- typedef size_t ppl_dimension_type

  An unsigned integral type for representing space dimensions.

- typedef const char * ppl_io_variable_output_function_type (ppl_dimension_type var)

  The type of output functions used for printing variables.

- typedef struct ppl_Polyhedron_tag * ppl_Polyhedron_t

  Opaque pointer.

- typedef struct ppl_Polyhedron_tag const * ppl_const_Polyhedron_t

  Opaque pointer to const object.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_tag * ppl_Pointset_Powerset_C_Polyhedron_t

  Opaque pointer.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_tag const * ppl_const_Pointset_Powerset_C_Polyhedron_t

  Opaque pointer to const object.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_iterator_tag * ppl_Pointset_Powerset_C_Polyhedron_iterator_t

  Opaque pointer.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_iterator_tag const * ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t

  Opaque pointer to const object.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag * ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t

  Opaque pointer.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag const * ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t

  Opaque pointer to const object.

Enumerations

- enum ppl_enum_Constraint_Type {

  PPL_CONSTRAINT_TYPE_LESS_THAN, PPL_CONSTRAINT_TYPE_LESS_OR_EQUAL, PPL_CONSTRAINT_TYPE_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_OR_EQUAL,

  PPL_CONSTRAINT_TYPE_GREATER_THAN }

  Describes the relations represented by a constraint.

- enum ppl_enum_Generator_Type { PPL_GENERATOR_TYPE_LINE, PPL_GENERATOR_TYPE_RAY, PPL_GENERATOR_TYPE_POINT, PPL_GENERATOR_TYPE_CLOSURE_POINT }

  Describes the different kinds of generators.

- enum ppl_enum_Grid_Generator_Type { PPL_GRID_GENERATOR_TYPE_LINE, PPL_GRID_GENERATOR_TYPE_PARAMETER, PPL_GRID_GENERATOR_TYPE_POINT }

  Describes the different kinds of grid generators.

- enum ppl_enum_Bounded_Integer_Type_Width {

  PPL_BITS_8, PPL_BITS_16, PPL_BITS_32, PPL_BITS_64,

  PPL_BITS_128 }

  Widths of bounded integer types.

- enum ppl_enum_Bounded_Integer_Type_Representation { PPL_UNSIGNED, PPL_SIGNED_2_COMPLEMENT }

  Representation of bounded integer types.

- enum ppl_enum_Bounded_Integer_Type_Overflow { PPL_OVERFLOW_WRAPS, PPL_OVERFLOW_UNDEFINED, PPL_OVERFLOW_IMPOSSIBLE }

  Overflow behavior of bounded integer types.

Functions

- int ppl_max_space_dimension (ppl_dimension_type *m)

  Writes to `m` the maximum space dimension this library can handle.

- int ppl_not_a_dimension (ppl_dimension_type *m)

  Writes to `m` a value that does not designate a valid dimension.

- int ppl_io_print_variable (ppl_dimension_type var)

  Pretty-prints `var` *to* `stdout`.

- int ppl_io_fprint_variable (FILE *stream, ppl_dimension_type var)

  Pretty-prints `var` *to the given output* `stream`.

- int ppl_io_asprint_variable (char **strp, ppl_dimension_type var)

  Pretty-prints `var` *to a malloc-allocated string, a pointer to which is returned via* `strp`.

- int ppl_io_set_variable_output_function (ppl_io_variable_output_function_type *p)

  Sets the output function to be used for printing variables to `p`.

- int ppl_io_get_variable_output_function (ppl_io_variable_output_function_type **pp)

  Writes a pointer to the current variable output function to `pp`.

- char * ppl_io_wrap_string (const char *src, unsigned indent_depth, unsigned preferred_first_line_-length, unsigned preferred_line_length)

  Utility function for the wrapping of lines of text.

Variables

- unsigned int PPL_COMPLEXITY_CLASS_POLYNOMIAL

  Code of the worst-case polynomial complexity class.

- unsigned int PPL_COMPLEXITY_CLASS_SIMPLEX

  Code of the worst-case exponential but typically polynomial complexity class.

- unsigned int PPL_COMPLEXITY_CLASS_ANY

  Code of the universal complexity class.

- unsigned int PPL_POLY_CON_RELATION_IS_DISJOINT

  Individual bit saying that the polyhedron and the set of points satisfying the constraint are disjoint.

- unsigned int PPL_POLY_CON_RELATION_STRICTLY_INTERSECTS

  Individual bit saying that the polyhedron intersects the set of points satisfying the constraint, but it is not included in it.

- unsigned int PPL_POLY_CON_RELATION_IS_INCLUDED

  Individual bit saying that the polyhedron is included in the set of points satisfying the constraint.

- unsigned int PPL_POLY_CON_RELATION_SATURATES

  Individual bit saying that the polyhedron is included in the set of points saturating the constraint.

- unsigned int PPL_POLY_GEN_RELATION_SUBSUMES

  Individual bit saying that adding the generator would not change the polyhedron.

8.6.1 Detailed Description

Typedefs for the library datatypes and related symbolic constants. The datatypes provided by the library should be manipulated by means of the corresponding opaque pointer types and the functions working on them.

Note

To simplify the detection of common programming mistakes, we provide both pointer-to-const and pointer-to-nonconst opaque pointers, with implicit conversions mapping each pointer-to-nonconst to the corresponding pointer-to-const when needed. The user of the C interface is therefore recommended to adopt the pointer-to-const type whenever read-only access is meant.

8.6.2 Typedef Documentation

8.6.2.1 typedef struct ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag const* ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t

Opaque pointer to const object.

Definition at line 1498 of file C_interface.dox.

8.6.2.2 typedef struct ppl_Pointset_Powerset_C_Polyhedron_iterator_tag const* ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t

Opaque pointer to const object.

Definition at line 1484 of file C_interface.dox.

8.6.2.3 typedef struct ppl_Pointset_Powerset_C_Polyhedron_tag const* ppl_const_Pointset_Powerset_C_Polyhedron_t

Opaque pointer to const object.

Definition at line 1470 of file C_interface.dox.

8.6.2.4 typedef struct ppl_Polyhedron_tag const* ppl_const_Polyhedron_t

Opaque pointer to const object.

Definition at line 48 of file C_interface.dox.

8.6.2.5 typedef size_t ppl_dimension_type

An unsigned integral type for representing space dimensions.

Definition at line 454 of file ppl_c_header.h.

8.6.2.6 typedef const char* ppl_io_variable_output_function_type(ppl_dimension_type var)

The type of output functions used for printing variables.

An output function for variables must write a textual representation for `var` to a character buffer, null-terminate it, and return a pointer to the beginning of the buffer. In case the operation fails, 0 should be returned and perhaps `errno` should be set in a meaningful way. The library does nothing with the buffer, besides printing its contents.

Definition at line 498 of file ppl_c_header.h.

8.6.2.7 typedef struct ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag* ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t

Opaque pointer.

Definition at line 1494 of file C_interface.dox.

8.6.2.8 typedef struct ppl_Pointset_Powerset_C_Polyhedron_iterator_tag* ppl_Pointset_Powerset_C_Polyhedron_iterator_t

Opaque pointer.

Definition at line 1480 of file C_interface.dox.

8.6.2.9 typedef struct ppl_Pointset_Powerset_C_Polyhedron_tag* ppl_Pointset_Powerset_C_Polyhedron_t

Opaque pointer.

Definition at line 1466 of file C_interface.dox.

8.6.2.10 typedef struct ppl_Polyhedron_tag* ppl_Polyhedron_t

Opaque pointer.

Definition at line 45 of file C_interface.dox.

8.6.3 Enumeration Type Documentation

8.6.3.1 enum ppl_enum_Bounded_Integer_Type_Overflow

Overflow behavior of bounded integer types.

Enumerator:

PPL_OVERFLOW_WRAPS On overflow, wrapping takes place. This means that, for a w-bit bounded integer, the computation happens modulo 2^w.

PPL_OVERFLOW_UNDEFINED On overflow, the result is undefined. This simply means that the result of the operation resulting in an overflow can take any value.

Note

Even though something more serious can happen in the system being analyzed ---due to, e.g., C's undefined behavior---, here we are only concerned with the results of arithmetic operations. It is the responsibility of the analyzer to ensure that other manifestations of undefined behavior are conservatively approximated.

PPL_OVERFLOW_IMPOSSIBLE Overflow is impossible. This is for the analysis of languages where overflow is trapped before it affects the state, for which, thus, any indication that an overflow may have affected the state is necessarily due to the imprecision of the analysis.

Definition at line 2362 of file ppl_c_header.h.

8.6.3.2 enum ppl_enum_Bounded_Integer_Type_Representation

Representation of bounded integer types.

Enumerator:

PPL_UNSIGNED Unsigned binary.

PPL_SIGNED_2_COMPLEMENT Signed binary where negative values are represented by the two's complement of the absolute value.

Definition at line 2349 of file ppl_c_header.h.

8.6.3.3 enum ppl_enum_Bounded_Integer_Type_Width

Widths of bounded integer types.

Enumerator:

PPL_BITS_8 8 bits.

PPL_BITS_16 16 bits.

PPL_BITS_32 32 bits.

PPL_BITS_64 64 bits.

PPL_BITS_128 128 bits.

Definition at line 2333 of file ppl_c_header.h.

8.6.3.4 enum ppl_enum_Constraint_Type

Describes the relations represented by a constraint.

Enumerator:

PPL_CONSTRAINT_TYPE_LESS_THAN The constraint is of the form $e < 0$.

PPL_CONSTRAINT_TYPE_LESS_OR_EQUAL The constraint is of the form $e \leq 0$.

PPL_CONSTRAINT_TYPE_EQUAL The constraint is of the form $e = 0$.

PPL_CONSTRAINT_TYPE_GREATER_OR_EQUAL The constraint is of the form $e \geq 0$.

PPL_CONSTRAINT_TYPE_GREATER_THAN The constraint is of the form $e > 0$.

Definition at line 1082 of file ppl_c_header.h.

8.6.3.5 enum ppl_enum_Generator_Type

Describes the different kinds of generators.

Enumerator:

PPL_GENERATOR_TYPE_LINE The generator is a line.

PPL_GENERATOR_TYPE_RAY The generator is a ray.

PPL_GENERATOR_TYPE_POINT The generator is a point.

PPL_GENERATOR_TYPE_CLOSURE_POINT The generator is a closure point.

Definition at line 1392 of file ppl_c_header.h.

8.6.3.6 enum ppl_enum_Grid_Generator_Type

Describes the different kinds of grid generators.

Enumerator:

PPL_GRID_GENERATOR_TYPE_LINE The grid generator is a line.

PPL_GRID_GENERATOR_TYPE_PARAMETER The grid generator is a parameter.

PPL_GRID_GENERATOR_TYPE_POINT The grid generator is a point.

Definition at line 1984 of file ppl_c_header.h.

8.6.4 Function Documentation

8.6.4.1 int ppl_io_asprint_variable (char ** *strp*, ppl_dimension_type *var*)

Pretty-prints `var` to a malloc-allocated string, a pointer to which is returned via `strp`.

Definition at line 2608 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function, PPL_ERROR_OUT_OF_MEMORY, and PPL_STDIO_ERROR.

8.6.4.2 int ppl_io_fprint_variable (FILE * *stream*, ppl_dimension_type *var*)

Pretty-prints `var` to the given output `stream`.

Definition at line 2599 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function, and PPL_STDIO_ERROR.

8.6.4.3 int ppl_io_get_variable_output_function (ppl_io_variable_output_function_type ** *pp*)

Writes a pointer to the current variable output function to `pp`.

Definition at line 2672 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function.

8.6.4.4 int ppl_io_print_variable (ppl_dimension_type *var*)

Pretty-prints `var` to `stdout`.

Definition at line 2590 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function, and PPL_STDIO_ERROR.

8.6.4.5 int ppl_io_set_variable_output_function (ppl_io_variable_output_function_type * *p*)

Sets the output function to be used for printing variables to `p`.

Definition at line 2664 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function.

8.6.4.6 char* ppl_io_wrap_string (const char * *src*, unsigned *indent_depth*, unsigned *preferred_first_line_length*, unsigned *preferred_line_length*)

Utility function for the wrapping of lines of text.

Parameters

src The source string holding the text to wrap.

indent_depth The indentation depth.

preferred_first_line_length The preferred length for the first line of text.

preferred_line_length The preferred length for all the lines but the first one.

Returns

The wrapped string in a malloc-allocated buffer.

Definition at line 2653 of file ppl_c_implementation_common.cc.

8.6.4.7 int ppl_max_space_dimension (ppl_dimension_type * *m*)

Writes to `m` the maximum space dimension this library can handle.

Definition at line 383 of file ppl_c_implementation_common.cc.

8.6.4.8 int ppl_not_a_dimension (ppl_dimension_type * *m*)

Writes to `m` a value that does not designate a valid dimension.

Definition at line 390 of file ppl_c_implementation_common.cc.

8.6.5 Variable Documentation

8.6.5.1 unsigned int PPL_COMPLEXITY_CLASS_ANY

Code of the universal complexity class.

Definition at line 149 of file ppl_c_implementation_common.cc.

8.6.5.2 unsigned int PPL_COMPLEXITY_CLASS_POLYNOMIAL

Code of the worst-case polynomial complexity class.

Definition at line 147 of file ppl_c_implementation_common.cc.

8.6.5.3 unsigned int PPL_COMPLEXITY_CLASS_SIMPLEX

Code of the worst-case exponential but typically polynomial complexity class.

Definition at line 148 of file ppl_c_implementation_common.cc.

8.6.5.4 unsigned int PPL_POLY_CON_RELATION_IS_DISJOINT

Individual bit saying that the polyhedron and the set of points satisfying the constraint are disjoint.

Definition at line 140 of file ppl_c_implementation_common.cc.

8.6.5.5 unsigned int PPL_POLY_CON_RELATION_IS_INCLUDED

Individual bit saying that the polyhedron is included in the set of points satisfying the constraint.

Definition at line 142 of file ppl_c_implementation_common.cc.

8.6.5.6 unsigned int PPL_POLY_CON_RELATION_SATURATES

Individual bit saying that the polyhedron is included in the set of points saturating the constraint.

Definition at line 143 of file ppl_c_implementation_common.cc.

8.6.5.7 unsigned int PPL_POLY_CON_RELATION_STRICTLY_INTERSECTS

Individual bit saying that the polyhedron intersects the set of points satisfying the constraint, but it is not included in it.

Definition at line 141 of file ppl_c_implementation_common.cc.

8.6.5.8 unsigned int PPL_POLY_GEN_RELATION_SUBSUMES

Individual bit saying that adding the generator would not change the polyhedron.

Definition at line 145 of file ppl_c_implementation_common.cc.

9 Namespace Documentation

9.1 Parma_Polyhedra_Library Namespace Reference

Namespaces

- namespace Interfaces

9.2 Parma_Polyhedra_Library::Interfaces Namespace Reference

Namespaces

- namespace C

9.3 Parma_Polyhedra_Library::Interfaces::C Namespace Reference

Classes

- class Array_Partial_Function_Wrapper

  A class to wrap an array of fixed length into a partial function interface suitable for the map_space_dimension() methods.

- class timeout_exception
- class deterministic_timeout_exception

Typedefs

- typedef const char * c_variable_output_function_type (ppl_dimension_type var)
- typedef void(* error_handler_type)(enum ppl_enum_error_code code, const char *description)
- typedef Constraint_System::const_iterator Constraint_System_const_iterator
- typedef Generator_System::const_iterator Generator_System_const_iterator
- typedef Congruence_System::const_iterator Congruence_System_const_iterator
- typedef Grid_Generator_System::const_iterator Grid_Generator_System_const_iterator
- typedef PIP_Tree_Node::Artificial_Parameter Artificial_Parameter
- typedef PIP_Tree_Node::Artificial_Parameter_Sequence Artificial_Parameter_Sequence
- typedef PIP_Tree_Node::Artificial_Parameter_Sequence::const_iterator Artificial_Parameter_Sequence_const_iterator

Functions

- const char * c_variable_default_output_function (ppl_dimension_type var)
- void cxx_Variable_output_function (std::ostream &s, const Variable &v)
- void notify_error (enum ppl_enum_error_code code, const char *description)
- void reset_timeout ()
- void reset_deterministic_timeout ()
- Relation_Symbol relation_symbol (enum ppl_enum_Constraint_Type t)
- Bounded_Integer_Type_Width bounded_integer_type_width (enum ppl_enum_Bounded_Integer_Type_Width w)
- Bounded_Integer_Type_Representation bounded_integer_type_representation (enum ppl_enum_Bounded_Integer_Type_Representation r)
- mpz_class & reinterpret_mpz_class (mpz_t n)

  Reinterpret an mpz_t as mpz_class.

- const Coefficient * to_const (ppl_const_Coefficient_t x)
- Coefficient * to_nonconst (ppl_Coefficient_t x)
- ppl_const_Coefficient_t to_const (const Coefficient *x)
- ppl_Coefficient_t to_nonconst (Coefficient *x)
- const Linear_Expression * to_const (ppl_const_Linear_Expression_t x)
- Linear_Expression * to_nonconst (ppl_Linear_Expression_t x)
- ppl_const_Linear_Expression_t to_const (const Linear_Expression *x)
- ppl_Linear_Expression_t to_nonconst (Linear_Expression *x)
- const Constraint * to_const (ppl_const_Constraint_t x)
- Constraint * to_nonconst (ppl_Constraint_t x)
- ppl_const_Constraint_t to_const (const Constraint *x)

- ppl_const_Grid_Generator_System_const_iterator_t to_const (const Grid_Generator_System_const_iterator *x)
- ppl_Grid_Generator_System_const_iterator_t to_nonconst (Grid_Generator_System_const_iterator *x)
- const Artificial_Parameter * to_const (ppl_const_Artificial_Parameter_t x)
- Artificial_Parameter * to_nonconst (ppl_Artificial_Parameter_t x)
- ppl_const_Artificial_Parameter_t to_const (const Artificial_Parameter *x)
- ppl_Artificial_Parameter_t to_nonconst (Artificial_Parameter *x)
- const Artificial_Parameter_Sequence * to_const (ppl_const_Artificial_Parameter_Sequence_t x)
- Artificial_Parameter_Sequence * to_nonconst (ppl_Artificial_Parameter_Sequence_t x)
- ppl_const_Artificial_Parameter_Sequence_t to_const (const Artificial_Parameter_Sequence *x)
- ppl_Artificial_Parameter_Sequence_t to_nonconst (Artificial_Parameter_Sequence *x)
- const Artificial_Parameter_Sequence_const_iterator * to_const (ppl_const_Artificial_Parameter_Sequence_const_iterator_t x)
- Artificial_Parameter_Sequence_const_iterator * to_nonconst (ppl_Artificial_Parameter_Sequence_const_iterator_t x)
- ppl_const_Artificial_Parameter_Sequence_const_iterator_t to_const (const Artificial_Parameter_Sequence_const_iterator *x)
- ppl_Artificial_Parameter_Sequence_const_iterator_t to_nonconst (Artificial_Parameter_Sequence_const_iterator *x)
- const MIP_Problem * to_const (ppl_const_MIP_Problem_t x)
- MIP_Problem * to_nonconst (ppl_MIP_Problem_t x)
- ppl_const_MIP_Problem_t to_const (const MIP_Problem *x)
- ppl_MIP_Problem_t to_nonconst (MIP_Problem *x)
- const PIP_Problem * to_const (ppl_const_PIP_Problem_t x)
- PIP_Problem * to_nonconst (ppl_PIP_Problem_t x)
- ppl_const_PIP_Problem_t to_const (const PIP_Problem *x)
- ppl_PIP_Problem_t to_nonconst (PIP_Problem *x)
- const PIP_Tree_Node * to_const (ppl_const_PIP_Tree_Node_t x)
- PIP_Tree_Node * to_nonconst (ppl_PIP_Tree_Node_t x)
- ppl_const_PIP_Tree_Node_t to_const (const PIP_Tree_Node *x)
- ppl_PIP_Tree_Node_t to_nonconst (PIP_Tree_Node *x)
- const PIP_Decision_Node * to_const (ppl_const_PIP_Decision_Node_t x)
- PIP_Decision_Node * to_nonconst (ppl_PIP_Decision_Node_t x)
- ppl_const_PIP_Decision_Node_t to_const (const PIP_Decision_Node *x)
- ppl_PIP_Decision_Node_t to_nonconst (PIP_Decision_Node *x)
- const PIP_Solution_Node * to_const (ppl_const_PIP_Solution_Node_t x)
- PIP_Solution_Node * to_nonconst (ppl_PIP_Solution_Node_t x)
- ppl_const_PIP_Solution_Node_t to_const (const PIP_Solution_Node *x)
- ppl_PIP_Solution_Node_t to_nonconst (PIP_Solution_Node *x)
- Bounded_Integer_Type_Overflow bounded_integer_type_overflow (enum ppl_enum_Bounded_Integer_Type_Overflow o)

Variables

- error_handler_type user_error_handler = 0
- ppl_io_variable_output_function_type * c_variable_output_function
- Variable::output_function_type * saved_cxx_Variable_output_function

9.3.1 Typedef Documentation

9.3.1.1 typedef PIP_Tree_Node::Artificial_Parameter Parma_Polyhedra_-Library::Interfaces::C::Artificial_Parameter

Definition at line 80 of file ppl_c_implementation_common.inlines.hh.

9.3.1.2 typedef PIP_Tree_Node::Artificial_Parameter_Sequence Parma_Polyhedra_-Library::Interfaces::C::Artificial_Parameter_Sequence

Definition at line 84 of file ppl_c_implementation_common.inlines.hh.

9.3.1.3 typedef PIP_Tree_Node::Artificial_Parameter_Sequence::const_iterator Parma_Polyhedra_Library::Interfaces::C::Artificial_Parameter_Sequence_const_iterator

Definition at line 89 of file ppl_c_implementation_common.inlines.hh.

9.3.1.4 typedef const char* Parma_Polyhedra_Library::Interfaces::C::c_variable_output_-function_type(ppl_dimension_type var)

Definition at line 81 of file ppl_c_implementation_common.cc.

9.3.1.5 typedef Congruence_System::const_iterator Parma_Polyhedra_-Library::Interfaces::C::Congruence_System_const_iterator

Definition at line 66 of file ppl_c_implementation_common.inlines.hh.

9.3.1.6 typedef Constraint_System::const_iterator Parma_Polyhedra_-Library::Interfaces::C::Constraint_System_const_iterator

Definition at line 50 of file ppl_c_implementation_common.inlines.hh.

9.3.1.7 typedef void(* Parma_Polyhedra_Library::Interfaces::C::error_handler_type)(enum ppl_enum_error_code code, const char *description)

Definition at line 42 of file ppl_c_implementation_common.defs.hh.

9.3.1.8 typedef Generator_System::const_iterator Parma_Polyhedra_Library::Interfaces::C::Generator_System_const_iterator

Definition at line 58 of file ppl_c_implementation_common.inlines.hh.

9.3.1.9 typedef Grid_Generator_System::const_iterator Parma_Polyhedra_Library::Interfaces::C::Grid_Generator_System_const_iterator

Definition at line 75 of file ppl_c_implementation_common.inlines.hh.

9.3.2 Function Documentation

9.3.2.1 Bounded_Integer_Type_Overflow Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_overflow (enum ppl_enum_Bounded_Integer_Type_Overflow *o*) `[inline]`

Definition at line 152 of file ppl_c_implementation_common.inlines.hh.

References PPL_OVERFLOW_IMPOSSIBLE, PPL_OVERFLOW_UNDEFINED, and PPL_OVERFLOW_WRAPS.

9.3.2.2 Bounded_Integer_Type_Representation Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_representation (enum ppl_enum_Bounded_Integer_Type_Representation *r*) `[inline]`

Definition at line 140 of file ppl_c_implementation_common.inlines.hh.

References PPL_SIGNED_2_COMPLEMENT, and PPL_UNSIGNED.

9.3.2.3 Bounded_Integer_Type_Width Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_width (enum ppl_enum_Bounded_Integer_Type_Width *w*) `[inline]`

Definition at line 122 of file ppl_c_implementation_common.inlines.hh.

References PPL_BITS_128, PPL_BITS_16, PPL_BITS_32, PPL_BITS_64, and PPL_BITS_8.

9.3.2.4 const char* Parma_Polyhedra_Library::Interfaces::C::c_variable_default_output_function (ppl_dimension_type *var*)

Definition at line 32 of file ppl_c_implementation_common.cc.

References CONVERSION, FORMAT, and user_error_handler.

Referenced by ppl_initialize().

9.3.2.5 void Parma_Polyhedra_Library::Interfaces::C::cxx_Variable_output_function (std::ostream & *s*, const Variable & *v*)

Definition at line 71 of file ppl_c_implementation_common.cc.

References c_variable_output_function.

Referenced by ppl_initialize().

9.3.2.6 void Parma_Polyhedra_Library::Interfaces::C::notify_error (enum ppl_enum_error_code *code*, const char * *description*)

9.3.2.7 mpz_class& Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class (mpz_t *n*) [inline]

Reinterpret an mpz_t as mpz_class.

Definition at line 38 of file ppl_c_implementation_common.inlines.hh.

Referenced by ppl_assign_Coefficient_from_mpz_t(), ppl_Coefficient_max(), ppl_Coefficient_min(), ppl_Coefficient_to_mpz_t(), and ppl_new_Coefficient_from_mpz_t().

9.3.2.8 Relation_Symbol Parma_Polyhedra_Library::Interfaces::C::relation_symbol (enum ppl_enum_Constraint_Type *t*) [inline]

Definition at line 104 of file ppl_c_implementation_common.inlines.hh.

References PPL_CONSTRAINT_TYPE_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_OR_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_THAN, PPL_CONSTRAINT_TYPE_LESS_OR_EQUAL, and PPL_CONSTRAINT_TYPE_LESS_THAN.

9.3.2.9 void Parma_Polyhedra_Library::Interfaces::C::reset_deterministic_timeout ()

Referenced by ppl_reset_deterministic_timeout(), and ppl_set_deterministic_timeout().

9.3.2.10 void Parma_Polyhedra_Library::Interfaces::C::reset_timeout ()

Referenced by ppl_reset_timeout(), and ppl_set_timeout().

9.3.2.11 ppl_const_PIP_Solution_Node_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Solution_Node * x) [inline]

Definition at line 101 of file ppl_c_implementation_common.inlines.hh.

9.3.2.12 const PIP_Solution_Node* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Solution_Node_t x) [inline]

Definition at line 101 of file ppl_c_implementation_common.inlines.hh.

9.3.2.13 ppl_const_PIP_Decision_Node_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Decision_Node * x) [inline]

Definition at line 99 of file ppl_c_implementation_common.inlines.hh.

9.3.2.14 const PIP_Decision_Node* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Decision_Node_t x) [inline]

Definition at line 99 of file ppl_c_implementation_common.inlines.hh.

9.3.2.15 ppl_const_PIP_Tree_Node_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Tree_Node * x) [inline]

Definition at line 97 of file ppl_c_implementation_common.inlines.hh.

9.3.2.16 const PIP_Tree_Node* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Tree_Node_t x) [inline]

Definition at line 97 of file ppl_c_implementation_common.inlines.hh.

9.3.2.17 ppl_const_PIP_Problem_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Problem * x) [inline]

Definition at line 95 of file ppl_c_implementation_common.inlines.hh.

9.3.2.18 const PIP_Problem* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Problem_t x) [inline]

Definition at line 95 of file ppl_c_implementation_common.inlines.hh.

9.3.2.19 ppl_const_MIP_Problem_t Parma_Polyhedra_Library::Interfaces::C::to_const (const MIP_Problem * x) [inline]

Definition at line 93 of file ppl_c_implementation_common.inlines.hh.

9.3.2.20 const MIP_Problem* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_MIP_Problem_t x) [inline]

Definition at line 93 of file ppl_c_implementation_common.inlines.hh.

9.3.2.21 ppl_const_Artificial_Parameter_Sequence_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Artificial_Parameter_Sequence_const_iterator * x) [inline]

Definition at line 91 of file ppl_c_implementation_common.inlines.hh.

9.3.2.22 const Artificial_Parameter_Sequence_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Artificial_Parameter_Sequence_const_iterator_t x) [inline]

Definition at line 91 of file ppl_c_implementation_common.inlines.hh.

9.3.2.23 ppl_const_Artificial_Parameter_Sequence_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Artificial_Parameter_Sequence * x) [inline]

Definition at line 86 of file ppl_c_implementation_common.inlines.hh.

9.3.2.24 const Artificial_Parameter_Sequence* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Artificial_Parameter_Sequence_t x) [inline]

Definition at line 86 of file ppl_c_implementation_common.inlines.hh.

9.3.2.25 ppl_const_Artificial_Parameter_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Artificial_Parameter * x) [inline]

Definition at line 81 of file ppl_c_implementation_common.inlines.hh.

9.3.2.26 const Artificial_Parameter* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Artificial_Parameter_t *x*) [inline]

Definition at line 81 of file ppl_c_implementation_common.inlines.hh.

9.3.2.27 ppl_const_Grid_Generator_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Grid_Generator_System_const_iterator * *x*) [inline]

Definition at line 77 of file ppl_c_implementation_common.inlines.hh.

9.3.2.28 const Grid_Generator_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Grid_Generator_System_const_iterator_t *x*) [inline]

Definition at line 77 of file ppl_c_implementation_common.inlines.hh.

9.3.2.29 ppl_const_Grid_Generator_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Grid_Generator_System * *x*) [inline]

Definition at line 72 of file ppl_c_implementation_common.inlines.hh.

9.3.2.30 const Grid_Generator_System* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Grid_Generator_System_t *x*) [inline]

Definition at line 72 of file ppl_c_implementation_common.inlines.hh.

9.3.2.31 ppl_const_Grid_Generator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Grid_Generator * *x*) [inline]

Definition at line 70 of file ppl_c_implementation_common.inlines.hh.

9.3.2.32 const Grid_Generator* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Grid_Generator_t *x*) [inline]

Definition at line 70 of file ppl_c_implementation_common.inlines.hh.

9.3.2.33 ppl_const_Congruence_System_const_iterator_t Parma_Polyhedra_-Library::Interfaces::C::to_const (const Congruence_System_const_iterator * x) [inline]

Definition at line 68 of file ppl_c_implementation_common.inlines.hh.

9.3.2.34 const Congruence_System_const_iterator* Parma_Polyhedra_-Library::Interfaces::C::to_const (ppl_const_Congruence_System_const_iterator_t x) [inline]

Definition at line 68 of file ppl_c_implementation_common.inlines.hh.

9.3.2.35 ppl_const_Congruence_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Congruence_System * x) [inline]

Definition at line 64 of file ppl_c_implementation_common.inlines.hh.

9.3.2.36 const Congruence_System* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Congruence_System_t x) [inline]

Definition at line 64 of file ppl_c_implementation_common.inlines.hh.

9.3.2.37 ppl_const_Congruence_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Congruence * x) [inline]

Definition at line 62 of file ppl_c_implementation_common.inlines.hh.

9.3.2.38 const Congruence* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Congruence_t x) [inline]

Definition at line 62 of file ppl_c_implementation_common.inlines.hh.

9.3.2.39 ppl_const_Generator_System_const_iterator_t Parma_Polyhedra_-Library::Interfaces::C::to_const (const Generator_System_const_iterator * x) [inline]

Definition at line 60 of file ppl_c_implementation_common.inlines.hh.

9.3.2.40 const Generator_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Generator_System_const_iterator_t *x*) [inline]

Definition at line 60 of file ppl_c_implementation_common.inlines.hh.

9.3.2.41 ppl_const_Generator_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Generator_System * *x*) [inline]

Definition at line 56 of file ppl_c_implementation_common.inlines.hh.

9.3.2.42 const Generator_System* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Generator_System_t *x*) [inline]

Definition at line 56 of file ppl_c_implementation_common.inlines.hh.

9.3.2.43 ppl_const_Generator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Generator * *x*) [inline]

Definition at line 54 of file ppl_c_implementation_common.inlines.hh.

9.3.2.44 const Generator* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Generator_t *x*) [inline]

Definition at line 54 of file ppl_c_implementation_common.inlines.hh.

9.3.2.45 ppl_const_Constraint_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Constraint_System_const_iterator * *x*) [inline]

Definition at line 52 of file ppl_c_implementation_common.inlines.hh.

9.3.2.46 const Constraint_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Constraint_System_const_iterator_t *x*) [inline]

Definition at line 52 of file ppl_c_implementation_common.inlines.hh.

9.3.2.47 ppl_const_Constraint_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Constraint_System * x) [inline]

Definition at line 48 of file ppl_c_implementation_common.inlines.hh.

9.3.2.48 const Constraint_System* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Constraint_System_t x) [inline]

Definition at line 48 of file ppl_c_implementation_common.inlines.hh.

9.3.2.49 ppl_const_Constraint_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Constraint * x) [inline]

Definition at line 46 of file ppl_c_implementation_common.inlines.hh.

9.3.2.50 const Constraint* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Constraint_t x) [inline]

Definition at line 46 of file ppl_c_implementation_common.inlines.hh.

9.3.2.51 ppl_const_Linear_Expression_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Linear_Expression * x) [inline]

Definition at line 44 of file ppl_c_implementation_common.inlines.hh.

9.3.2.52 const Linear_Expression* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Linear_Expression_t x) [inline]

Definition at line 44 of file ppl_c_implementation_common.inlines.hh.

9.3.2.53 ppl_const_Coefficient_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Coefficient * x) [inline]

Definition at line 42 of file ppl_c_implementation_common.inlines.hh.

9.3.2.54 const Coefficient* Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Coefficient_t x) [inline]

Definition at line 42 of file ppl_c_implementation_common.inlines.hh.

Referenced by ppl_add_Linear_Expression_to_Linear_Expression(), ppl_Artificial_Parameter_coefficient(), ppl_Artificial_Parameter_denominator(), ppl_Artificial_Parameter_get_Linear_Expression(), ppl_Artificial_Parameter_inhomogeneous_term(), ppl_Artificial_Parameter_Sequence_const_iterator_dereference(), ppl_Artificial_Parameter_Sequence_const_iterator_equal_test(), ppl_assign_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator(), ppl_assign_Coefficient_from_Coefficient(), ppl_assign_Congruence_from_Congruence(), ppl_assign_Congruence_System_const_iterator_from_Congruence_System_const_iterator(), ppl_assign_Congruence_System_from_Congruence_System(), ppl_assign_Constraint_from_Constraint(), ppl_assign_Constraint_System_const_iterator_from_Constraint_System_const_iterator(), ppl_assign_Constraint_System_from_Constraint_System(), ppl_assign_Generator_from_Generator(), ppl_assign_Generator_System_const_iterator_from_Generator_System_const_iterator(), ppl_assign_Generator_System_from_Generator_System(), ppl_assign_Grid_Generator_from_Grid_Generator(), ppl_assign_Grid_Generator_System_const_iterator_from_Grid_Generator_System_const_iterator(), ppl_assign_Grid_Generator_System_from_Grid_Generator_System(), ppl_assign_Linear_Expression_from_Linear_Expression(), ppl_assign_MIP_Problem_from_MIP_Problem(), ppl_assign_PIP_Problem_from_PIP_Problem(), ppl_Coefficient_to_mpz_t(), ppl_Congruence_coefficient(), ppl_Congruence_inhomogeneous_term(), ppl_Congruence_modulus(), ppl_Congruence_OK(), ppl_Congruence_space_dimension(), ppl_Congruence_System_begin(), ppl_Congruence_System_const_iterator_dereference(), ppl_Congruence_System_const_iterator_equal_test(), ppl_Congruence_System_empty(), ppl_Congruence_System_end(), ppl_Congruence_System_insert_Congruence(), ppl_Congruence_System_OK(), ppl_Congruence_System_space_dimension(), ppl_Constraint_coefficient(), ppl_Constraint_inhomogeneous_term(), ppl_Constraint_OK(), ppl_Constraint_space_dimension(), ppl_Constraint_System_begin(), ppl_Constraint_System_const_iterator_dereference(), ppl_Constraint_System_const_iterator_equal_test(), ppl_Constraint_System_empty(), ppl_Constraint_System_end(), ppl_Constraint_System_has_strict_inequalities(), ppl_Constraint_System_insert_Constraint(), ppl_Constraint_System_OK(), ppl_Constraint_System_space_dimension(), ppl_Constraint_type(), ppl_delete_Artificial_Parameter_Sequence_const_iterator(), ppl_delete_Coefficient(), ppl_delete_Congruence(), ppl_delete_Congruence_System(), ppl_delete_Congruence_System_const_iterator(), ppl_delete_Constraint(), ppl_delete_Constraint_System(), ppl_delete_Constraint_System_const_iterator(), ppl_delete_Generator(), ppl_delete_Generator_System(), ppl_delete_Generator_System_const_iterator(), ppl_delete_Grid_Generator(), ppl_delete_Grid_Generator_System(), ppl_delete_Grid_Generator_System_const_iterator(), ppl_delete_Linear_Expression(), ppl_delete_MIP_Problem(), ppl_delete_PIP_Problem(), ppl_Generator_coefficient(), ppl_Generator_divisor(), ppl_Generator_OK(), ppl_Generator_space_dimension(), ppl_Generator_System_begin(), ppl_Generator_System_const_iterator_dereference(), ppl_Generator_System_const_iterator_equal_test(), ppl_Generator_System_empty(), ppl_Generator_System_end(), ppl_Generator_System_insert_Generator(), ppl_Generator_System_OK(), ppl_Generator_System_space_dimension(), ppl_Generator_type(), ppl_Grid_Generator_coefficient(), ppl_Grid_Generator_divisor(), ppl_Grid_Generator_OK(), ppl_Grid_Generator_space_dimension(), ppl_Grid_Generator_System_begin(), ppl_Grid_Generator_System_const_iterator_dereference(), ppl_Grid_Generator_System_const_iterator_equal_test(), ppl_Grid_Generator_System_empty(), ppl_Grid_Generator_System_end(), ppl_Grid_Generator_System_insert_Grid_Generator(), ppl_Grid_Generator_System_OK(), ppl_Grid_Generator_System_space_dimension(), ppl_Grid_Generator_type(), ppl_Linear_Expression_add_to_coefficient(), ppl_Linear_Expression_add_to_inhomogeneous(), ppl_Linear_Expression_all_homogeneous_terms_are_zero(), ppl_Linear_Expression_coefficient(), ppl_Linear_Expression_inhomogeneous_term(), ppl_Linear_Expression_is_zero(), ppl_Linear_Expression_OK(), ppl_Linear_Expression_space_dimension(), ppl_MIP_Problem_add_constraint(), ppl_MIP_Problem_add_constraints(), ppl_MIP_Problem_constraint_at_index(), ppl_MIP_Problem_evaluate_objective_function(), ppl_MIP_Problem_external_memory_in_bytes(), ppl_MIP_Problem_feasible_point(), ppl_MIP_Problem_get_control_parameter(), ppl_MIP_Problem_integer_space_dimensions(), ppl_MIP_Problem_is_satisfiable(), ppl_MIP_Problem_number_of_constraints(), ppl_MIP_Problem_number_of_integer_space_dimensions(), ppl_MIP_Problem_objective_function(), ppl_MIP_Problem_OK(), ppl_MIP_Problem_optimal_value(), ppl_MIP_Problem_optimization_

mode(), ppl_MIP_Problem_optimizing_point(), ppl_MIP_Problem_set_objective_function(), ppl_MIP_-Problem_solve(), ppl_MIP_Problem_space_dimension(), ppl_MIP_Problem_total_memory_in_bytes(), ppl_multiply_Linear_Expression_by_Coefficient(), ppl_new_Artificial_Parameter_Sequence_const_-iterator_from_Artificial_Parameter_Sequence_const_iterator(), ppl_new_Coefficient_from_Coefficient(), ppl_new_Congruence(), ppl_new_Congruence_from_Congruence(), ppl_new_Congruence_System_-const_iterator_from_Congruence_System_const_iterator(), ppl_new_Congruence_System_from_-Congruence(), ppl_new_Congruence_System_from_Congruence_System(), ppl_new_Constraint(), ppl_new_Constraint_from_Constraint(), ppl_new_Constraint_System_const_iterator_from_Constraint_-System_const_iterator(), ppl_new_Constraint_System_from_Constraint(), ppl_new_Constraint_-System_from_Constraint_System(), ppl_new_Generator(), ppl_new_Generator_from_Generator(), ppl_new_Generator_System_const_iterator_from_Generator_System_const_iterator(), ppl_new_-Generator_System_from_Generator(), ppl_new_Generator_System_from_Generator_System(), ppl_-new_Grid_Generator(), ppl_new_Grid_Generator_from_Grid_Generator(), ppl_new_Grid_Generator_-System_const_iterator_from_Grid_Generator_System_const_iterator(), ppl_new_Grid_Generator_-System_from_Grid_Generator(), ppl_new_Grid_Generator_System_from_Grid_Generator_System(), ppl_new_Linear_Expression_from_Congruence(), ppl_new_Linear_Expression_from_Constraint(), ppl_-new_Linear_Expression_from_Generator(), ppl_new_Linear_Expression_from_Linear_Expression(), ppl_new_MIP_Problem(), ppl_new_MIP_Problem_from_MIP_Problem(), ppl_new_PIP_Problem_-from_constraints(), ppl_new_PIP_Problem_from_PIP_Problem(), ppl_PIP_Decision_Node_get_child_-node(), ppl_PIP_Decision_Node_OK(), ppl_PIP_Problem_add_constraint(), ppl_PIP_Problem_add_-constraints(), ppl_PIP_Problem_constraint_at_index(), ppl_PIP_Problem_external_memory_in_bytes(), ppl_PIP_Problem_get_big_parameter_dimension(), ppl_PIP_Problem_get_control_parameter(), ppl_-PIP_Problem_is_satisfiable(), ppl_PIP_Problem_number_of_constraints(), ppl_PIP_Problem_number_-of_parameter_space_dimensions(), ppl_PIP_Problem_OK(), ppl_PIP_Problem_optimizing_solution(), ppl_PIP_Problem_parameter_space_dimensions(), ppl_PIP_Problem_solution(), ppl_PIP_Problem_-solve(), ppl_PIP_Problem_space_dimension(), ppl_PIP_Problem_total_memory_in_bytes(), ppl_PIP_-Solution_Node_get_parametric_values(), ppl_PIP_Solution_Node_OK(), ppl_PIP_Tree_Node_as_-decision(), ppl_PIP_Tree_Node_as_solution(), ppl_PIP_Tree_Node_begin(), ppl_PIP_Tree_Node_end(), ppl_PIP_Tree_Node_get_constraints(), ppl_PIP_Tree_Node_number_of_artificials(), ppl_PIP_Tree_-Node_OK(), and ppl_subtract_Linear_Expression_from_Linear_Expression().

9.3.2.55 ppl_PIP_Solution_Node_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Solution_Node * *x*) [inline]

Definition at line 101 of file ppl_c_implementation_common.inlines.hh.

9.3.2.56 PIP_Solution_Node* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Solution_Node_t *x*) [inline]

Definition at line 101 of file ppl_c_implementation_common.inlines.hh.

9.3.2.57 ppl_PIP_Decision_Node_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Decision_Node * *x*) [inline]

Definition at line 99 of file ppl_c_implementation_common.inlines.hh.

9.3.2.58 PIP_Decision_Node* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Decision_Node_t *x*) [inline]

Definition at line 99 of file ppl_c_implementation_common.inlines.hh.

9.3.2.59 ppl_PIP_Tree_Node_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Tree_Node * *x*) [inline]

Definition at line 97 of file ppl_c_implementation_common.inlines.hh.

9.3.2.60 PIP_Tree_Node* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Tree_Node_t *x*) [inline]

Definition at line 97 of file ppl_c_implementation_common.inlines.hh.

9.3.2.61 ppl_PIP_Problem_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Problem * *x*) [inline]

Definition at line 95 of file ppl_c_implementation_common.inlines.hh.

9.3.2.62 PIP_Problem* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Problem_t *x*) [inline]

Definition at line 95 of file ppl_c_implementation_common.inlines.hh.

9.3.2.63 ppl_MIP_Problem_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (MIP_Problem * *x*) [inline]

Definition at line 93 of file ppl_c_implementation_common.inlines.hh.

9.3.2.64 MIP_Problem* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_MIP_Problem_t *x*) [inline]

Definition at line 93 of file ppl_c_implementation_common.inlines.hh.

9.3.2.65 ppl_Artificial_Parameter_Sequence_const_iterator_t Parma_Polyhedra_-Library::Interfaces::C::to_nonconst (Artificial_Parameter_Sequence_const_iterator * x) [inline]

Definition at line 91 of file ppl_c_implementation_common.inlines.hh.

9.3.2.66 Artificial_Parameter_Sequence_const_iterator* Parma_Polyhedra_-Library::Interfaces::C::to_nonconst (ppl_Artificial_Parameter_Sequence_const_-iterator_t x) [inline]

Definition at line 91 of file ppl_c_implementation_common.inlines.hh.

9.3.2.67 ppl_Artificial_Parameter_Sequence_t Parma_Polyhedra_Library::Interfaces::C::to_-nonconst (Artificial_Parameter_Sequence * x) [inline]

Definition at line 86 of file ppl_c_implementation_common.inlines.hh.

9.3.2.68 Artificial_Parameter_Sequence* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Artificial_Parameter_Sequence_t x) [inline]

Definition at line 86 of file ppl_c_implementation_common.inlines.hh.

9.3.2.69 ppl_Artificial_Parameter_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Artificial_Parameter * x) [inline]

Definition at line 81 of file ppl_c_implementation_common.inlines.hh.

9.3.2.70 Artificial_Parameter* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Artificial_Parameter_t x) [inline]

Definition at line 81 of file ppl_c_implementation_common.inlines.hh.

9.3.2.71 ppl_Grid_Generator_System_const_iterator_t Parma_Polyhedra_-Library::Interfaces::C::to_nonconst (Grid_Generator_System_const_iterator * x) [inline]

Definition at line 77 of file ppl_c_implementation_common.inlines.hh.

9.3.2.72 Grid_Generator_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Grid_Generator_System_const_iterator_t *x*) [inline]

Definition at line 77 of file ppl_c_implementation_common.inlines.hh.

9.3.2.73 ppl_Grid_Generator_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Grid_Generator_System * *x*) [inline]

Definition at line 72 of file ppl_c_implementation_common.inlines.hh.

9.3.2.74 Grid_Generator_System* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Grid_Generator_System_t *x*) [inline]

Definition at line 72 of file ppl_c_implementation_common.inlines.hh.

9.3.2.75 ppl_Grid_Generator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Grid_Generator * *x*) [inline]

Definition at line 70 of file ppl_c_implementation_common.inlines.hh.

9.3.2.76 Grid_Generator* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Grid_Generator_t *x*) [inline]

Definition at line 70 of file ppl_c_implementation_common.inlines.hh.

9.3.2.77 ppl_Congruence_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Congruence_System_const_iterator * *x*) [inline]

Definition at line 68 of file ppl_c_implementation_common.inlines.hh.

9.3.2.78 Congruence_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Congruence_System_const_iterator_t *x*) [inline]

Definition at line 68 of file ppl_c_implementation_common.inlines.hh.

9.3.2.79 ppl_Congruence_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Congruence_System * x) [inline]

Definition at line 64 of file ppl_c_implementation_common.inlines.hh.

9.3.2.80 Congruence_System* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Congruence_System_t x) [inline]

Definition at line 64 of file ppl_c_implementation_common.inlines.hh.

9.3.2.81 ppl_Congruence_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Congruence * x) [inline]

Definition at line 62 of file ppl_c_implementation_common.inlines.hh.

9.3.2.82 Congruence* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Congruence_t x) [inline]

Definition at line 62 of file ppl_c_implementation_common.inlines.hh.

9.3.2.83 ppl_Generator_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Generator_System_const_iterator * x) [inline]

Definition at line 60 of file ppl_c_implementation_common.inlines.hh.

9.3.2.84 Generator_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Generator_System_const_iterator_t x) [inline]

Definition at line 60 of file ppl_c_implementation_common.inlines.hh.

9.3.2.85 ppl_Generator_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Generator_System * x) [inline]

Definition at line 56 of file ppl_c_implementation_common.inlines.hh.

9.3.2.86 Generator_System* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Generator_System_t x) [inline]

Definition at line 56 of file ppl_c_implementation_common.inlines.hh.

9.3.2.87 ppl_Generator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Generator * x) [inline]

Definition at line 54 of file ppl_c_implementation_common.inlines.hh.

9.3.2.88 Generator* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Generator_t x) [inline]

Definition at line 54 of file ppl_c_implementation_common.inlines.hh.

9.3.2.89 ppl_Constraint_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Constraint_System_const_iterator * x) [inline]

Definition at line 52 of file ppl_c_implementation_common.inlines.hh.

9.3.2.90 Constraint_System_const_iterator* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Constraint_System_const_iterator_t x) [inline]

Definition at line 52 of file ppl_c_implementation_common.inlines.hh.

9.3.2.91 ppl_Constraint_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Constraint_System * x) [inline]

Definition at line 48 of file ppl_c_implementation_common.inlines.hh.

9.3.2.92 Constraint_System* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Constraint_System_t x) [inline]

Definition at line 48 of file ppl_c_implementation_common.inlines.hh.

9.3.2.93 ppl_Constraint_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Constraint * x) [inline]

Definition at line 46 of file ppl_c_implementation_common.inlines.hh.

9.3.2.94 Constraint* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Constraint_t *x*) [inline]

Definition at line 46 of file ppl_c_implementation_common.inlines.hh.

9.3.2.95 ppl_Linear_Expression_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Linear_Expression * *x*) [inline]

Definition at line 44 of file ppl_c_implementation_common.inlines.hh.

9.3.2.96 Linear_Expression* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Linear_Expression_t *x*) [inline]

Definition at line 44 of file ppl_c_implementation_common.inlines.hh.

9.3.2.97 ppl_Coefficient_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Coefficient * *x*) [inline]

Definition at line 42 of file ppl_c_implementation_common.inlines.hh.

9.3.2.98 Coefficient* Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Coefficient_t *x*) [inline]

Definition at line 42 of file ppl_c_implementation_common.inlines.hh.

Referenced by ppl_add_Linear_Expression_to_Linear_Expression(), ppl_Artificial_Parameter_coefficient(), ppl_Artificial_Parameter_denominator(), ppl_Artificial_Parameter_get_Linear_Expression(), ppl_Artificial_Parameter_inhomogeneous_term(), ppl_Artificial_Parameter_Sequence_const_iterator_increment(), ppl_assign_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator(), ppl_assign_Coefficient_from_Coefficient(), ppl_assign_Coefficient_from_mpz_t(), ppl_assign_Congruence_from_Congruence(), ppl_assign_Congruence_System_const_iterator_from_Congruence_System_const_iterator(), ppl_assign_Congruence_System_from_Congruence_System(), ppl_assign_Constraint_from_Constraint(), ppl_assign_Constraint_System_const_iterator_from_Constraint_System_const_iterator(), ppl_assign_Constraint_System_from_Constraint_System(), ppl_assign_Generator_from_Generator(), ppl_assign_Generator_System_const_iterator_from_Generator_System_const_iterator(), ppl_assign_Generator_System_from_Generator_System(), ppl_assign_Grid_Generator_from_Grid_Generator(), ppl_assign_Grid_Generator_System_const_iterator_from_Grid_Generator_System_const_iterator(), ppl_assign_Grid_Generator_System_from_Grid_Generator_System(), ppl_assign_Linear_Expression_from_Linear_Expression(), ppl_assign_MIP_Problem_from_MIP_Problem(), ppl_assign_PIP_Problem_from_PIP_Problem(), ppl_Congruence_coefficient(), ppl_Congruence_inhomogeneous_term(), ppl_Congruence_modulus(), ppl_Congruence_System_begin(), ppl_Congruence_System_clear(), ppl_Congruence_System_const_iterator_increment(), ppl_Congruence_System_end(), ppl_Congruence_System_insert_Congruence(), ppl_Constraint_coefficient(), ppl_Constraint_inhomogeneous_term(), ppl_Constraint_System_begin(),

ppl_Constraint_System_clear(), ppl_Constraint_System_const_iterator_increment(), ppl_Constraint_System_end(), ppl_Constraint_System_insert_Constraint(), ppl_Generator_coefficient(), ppl_Generator_divisor(), ppl_Generator_System_begin(), ppl_Generator_System_clear(), ppl_Generator_System_const_iterator_increment(), ppl_Generator_System_end(), ppl_Generator_System_insert_Generator(), ppl_Grid_Generator_coefficient(), ppl_Grid_Generator_divisor(), ppl_Grid_Generator_System_begin(), ppl_Grid_Generator_System_clear(), ppl_Grid_Generator_System_const_iterator_increment(), ppl_Grid_Generator_System_end(), ppl_Grid_Generator_System_insert_Grid_Generator(), ppl_Linear_Expression_add_to_coefficient(), ppl_Linear_Expression_add_to_inhomogeneous(), ppl_Linear_Expression_coefficient(), ppl_Linear_Expression_inhomogeneous_term(), ppl_MIP_Problem_add_constraint(), ppl_MIP_Problem_add_constraints(), ppl_MIP_Problem_add_space_dimensions_and_embed(), ppl_MIP_Problem_add_to_integer_space_dimensions(), ppl_MIP_Problem_clear(), ppl_MIP_Problem_evaluate_objective_function(), ppl_MIP_Problem_optimal_value(), ppl_MIP_Problem_set_control_parameter(), ppl_MIP_Problem_set_objective_function(), ppl_MIP_Problem_set_optimization_mode(), ppl_multiply_Linear_Expression_by_Coefficient(), ppl_new_Artificial_Parameter_Sequence_const_iterator(), ppl_new_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator(), ppl_new_Coefficient(), ppl_new_Coefficient_from_Coefficient(), ppl_new_Coefficient_from_mpz_t(), ppl_new_Congruence(), ppl_new_Congruence_from_Congruence(), ppl_new_Congruence_System(), ppl_new_Congruence_System_const_iterator(), ppl_new_Congruence_System_const_iterator_from_Congruence_System_const_iterator(), ppl_new_Congruence_System_from_Congruence(), ppl_new_Congruence_System_from_Congruence_System(), ppl_new_Congruence_System_zero_dim_empty(), ppl_new_Congruence_zero_dim_false(), ppl_new_Congruence_zero_dim_integrality(), ppl_new_Constraint(), ppl_new_Constraint_from_Constraint(), ppl_new_Constraint_System(), ppl_new_Constraint_System_const_iterator(), ppl_new_Constraint_System_const_iterator_from_Constraint_System_const_iterator(), ppl_new_Constraint_System_from_Constraint(), ppl_new_Constraint_System_from_Constraint_System(), ppl_new_Constraint_System_zero_dim_empty(), ppl_new_Constraint_zero_dim_false(), ppl_new_Constraint_zero_dim_positivity(), ppl_new_Generator(), ppl_new_Generator_from_Generator(), ppl_new_Generator_System(), ppl_new_Generator_System_const_iterator(), ppl_new_Generator_System_const_iterator_from_Generator_System_const_iterator(), ppl_new_Generator_System_from_Generator(), ppl_new_Generator_System_from_Generator_System(), ppl_new_Generator_System_zero_dim_univ(), ppl_new_Generator_zero_dim_closure_point(), ppl_new_Generator_zero_dim_point(), ppl_new_Grid_Generator(), ppl_new_Grid_Generator_from_Grid_Generator(), ppl_new_Grid_Generator_System(), ppl_new_Grid_Generator_System_const_iterator(), ppl_new_Grid_Generator_System_const_iterator_from_Grid_Generator_System_const_iterator(), ppl_new_Grid_Generator_System_from_Grid_Generator(), ppl_new_Grid_Generator_System_from_Grid_Generator_System(), ppl_new_Grid_Generator_System_zero_dim_univ(), ppl_new_Grid_Generator_zero_dim_point(), ppl_new_Linear_Expression(), ppl_new_Linear_Expression_from_Congruence(), ppl_new_Linear_Expression_from_Constraint(), ppl_new_Linear_Expression_from_Generator(), ppl_new_Linear_Expression_from_Linear_Expression(), ppl_new_Linear_Expression_with_dimension(), ppl_new_MIP_Problem(), ppl_new_MIP_Problem_from_MIP_Problem(), ppl_new_MIP_Problem_from_space_dimension(), ppl_new_PIP_Problem_from_constraints(), ppl_new_PIP_Problem_from_PIP_Problem(), ppl_new_PIP_Problem_from_space_dimension(), ppl_PIP_Problem_add_constraint(), ppl_PIP_Problem_add_constraints(), ppl_PIP_Problem_add_space_dimensions_and_embed(), ppl_PIP_Problem_add_to_parameter_space_dimensions(), ppl_PIP_Problem_clear(), ppl_PIP_Problem_set_big_parameter_dimension(), ppl_PIP_Problem_set_control_parameter(), ppl_PIP_Tree_Node_begin(), ppl_PIP_Tree_Node_end(), and ppl_subtract_Linear_Expression_from_Linear_Expression().

9.3.3 Variable Documentation

9.3.3.1 ppl_io_variable_output_function_type* Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function

Definition at line 68 of file ppl_c_implementation_common.cc.

Referenced by cxx_Variable_output_function(), ppl_initialize(), ppl_io_asprint_variable(), ppl_io_fprint_variable(), ppl_io_get_variable_output_function(), ppl_io_print_variable(), and ppl_io_set_variable_output_function().

9.3.3.2 Variable::output_function_type* Parma_Polyhedra_Library::Interfaces::C::saved_cxx_Variable_output_function

Definition at line 84 of file ppl_c_implementation_common.cc.

Referenced by ppl_finalize(), and ppl_initialize().

9.3.3.3 error_handler_type Parma_Polyhedra_Library::Interfaces::C::user_error_handler = 0

Definition at line 29 of file ppl_c_implementation_common.cc.

Referenced by c_variable_default_output_function(), and ppl_set_error_handler().

10 Class Documentation

10.1 Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_Wrapper Class Reference

A class to wrap an array of fixed length into a partial function interface suitable for the map_space_dimension() methods.

`#include <ppl_c_implementation_common.defs.hh>`

Public Member Functions

- Array_Partial_Function_Wrapper (dimension_type *v, size_t n)

  Construct a partial function wrapping the first `n` positions of `v`.

- bool has_empty_codomain () const

  Returns `true` if and only if the represented partial function has an empty codomain (i.e., it is always undefined).

- dimension_type max_in_codomain () const

  Returns the maximum value that belongs to the codomain of the partial function.

- bool maps (dimension_type i, dimension_type &j) const

  Assigns to `j` the value associated to `i` by `*this`, if any.

Private Attributes

- dimension_type * vec

  Holds the vector implementing the map.

- size_t vec_size

  Holds the size of `vec`.

- dimension_type max_in_codomain_

  Cache for computing the maximum dimension in the codomain.

- int empty

10.1.1 Detailed Description

A class to wrap an array of fixed length into a partial function interface suitable for the map_space_-dimension() methods.

Definition at line 60 of file ppl_c_implementation_common.defs.hh.

10.1.2 Constructor & Destructor Documentation

10.1.2.1 Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_-Wrapper::Array_Partial_Function_Wrapper (dimension_type * *v*, size_t *n*) [inline]

Construct a partial function wrapping the first `n` positions of `v`.

Definition at line 167 of file ppl_c_implementation_common.inlines.hh.

10.1.3 Member Function Documentation

10.1.3.1 bool Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_-Wrapper::has_empty_codomain () const [inline]

Returns `true` if and only if the represented partial function has an empty codomain (i.e., it is always undefined).

Definition at line 172 of file ppl_c_implementation_common.inlines.hh.

References empty, vec, and vec_size.

10.1.3.2 bool Parma_Polyhedra_Library::Interfaces::C::Array_Partial_-Function_Wrapper::maps (dimension_type *i*, dimension_type & *j*) const [inline]

Assigns to `j` the value associated to `i` by `*this`, if any.

Let f be the function represented by `*this` and k be the value of `i`. If f is defined in k, then $f(k)$ is assigned to `j` and `true` is returned. If f is undefined in k, then `false` is returned.

Definition at line 199 of file ppl_c_implementation_common.inlines.hh.

References vec, and vec_size.

10.1.3.3 dimension_type Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_-Wrapper::max_in_codomain () const [inline]

Returns the maximum value that belongs to the codomain of the partial function.

Definition at line 185 of file ppl_c_implementation_common.inlines.hh.

References max_in_codomain_, vec, and vec_size.

10.1.4 Member Data Documentation

10.1.4.1 int Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_Wrapper::empty [mutable, private]

Cache for computing emptiness: -1 if we still don't know, 0 if not empty, 1 if empty.

Definition at line 103 of file ppl_c_implementation_common.defs.hh.

Referenced by has_empty_codomain().

10.1.4.2 dimension_type Parma_Polyhedra_Library::Interfaces::C::Array_-Partial_Function_Wrapper::max_in_codomain_ [mutable, private]

Cache for computing the maximum dimension in the codomain.

Definition at line 99 of file ppl_c_implementation_common.defs.hh.

Referenced by max_in_codomain().

10.1.4.3 dimension_type* Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_-Wrapper::vec [private]

Holds the vector implementing the map.

Definition at line 93 of file ppl_c_implementation_common.defs.hh.

Referenced by has_empty_codomain(), maps(), and max_in_codomain().

10.1.4.4 size_t Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_-Wrapper::vec_size [private]

Holds the size of vec.

Definition at line 96 of file ppl_c_implementation_common.defs.hh.

Referenced by has_empty_codomain(), maps(), and max_in_codomain().

The documentation for this class was generated from the following files:

- ppl_c_implementation_common.defs.hh
- ppl_c_implementation_common.inlines.hh

10.2 Parma_Polyhedra_Library::Interfaces::C::deterministic_timeout_exception Class Reference

`#include <ppl_c_implementation_common.defs.hh>`

Public Member Functions

- void throw_me () const
- int priority () const

10.2.1 Detailed Description

Definition at line 118 of file ppl_c_implementation_common.defs.hh.

10.2.2 Member Function Documentation

10.2.2.1 int Parma_Polyhedra_Library::Interfaces::C::deterministic_timeout_exception::priority () const [inline]

Definition at line 124 of file ppl_c_implementation_common.defs.hh.

10.2.2.2 void Parma_Polyhedra_Library::Interfaces::C::deterministic_timeout_exception::throw_me () const [inline]

Definition at line 121 of file ppl_c_implementation_common.defs.hh.

The documentation for this class was generated from the following file:

- ppl_c_implementation_common.defs.hh

10.3 ppl_Artificial_Parameter_Sequence_const_iterator_tag Interface Reference

Types and functions for iterating on PIP artificial parameters.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_-Sequence_const_iterator_t *papit)
  Builds a new 'const iterator' and writes a handle to it at address `papit`.

- int ppl_new_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_-Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t *papit, ppl_-const_Artificial_Parameter_Sequence_const_iterator_t apit)
  Builds a const iterator that is a copy of `apit`*; writes a handle for the newly created const iterator at address* `papit`.

- int ppl_assign_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_-Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t dst, ppl_const_-Artificial_Parameter_Sequence_const_iterator_t src)
  Assigns a copy of the const iterator `src` *to* `dst`.

- int ppl_delete_Artificial_Parameter_Sequence_const_iterator (ppl_const_Artificial_Parameter_-Sequence_const_iterator_t apit)
  Invalidates the handle `apit`*: this makes sure the corresponding resources will eventually be released.*

Dereferencing, Incrementing and Equality Testing

- int ppl_Artificial_Parameter_Sequence_const_iterator_dereference (ppl_const_Artificial_-Parameter_Sequence_const_iterator_t apit, ppl_const_Artificial_Parameter_t *pap)
  Dereference `apit` *writing a const handle to the resulting artificial parameter at address* `pap`.

- int ppl_Artificial_Parameter_Sequence_const_iterator_increment (ppl_Artificial_Parameter_-Sequence_const_iterator_t apit)
  Increment `apit` *so that it "points" to the next artificial parameter.*

- int ppl_Artificial_Parameter_Sequence_const_iterator_equal_test (ppl_const_Artificial_-Parameter_Sequence_const_iterator_t x, ppl_const_Artificial_Parameter_Sequence_const_-iterator_t y)
  Returns a positive integer if the iterators corresponding to `x` *and* `y` *are equal; returns 0 if they are different.*

10.3.1 Detailed Description

Types and functions for iterating on PIP artificial parameters.

10.3.2 Friends And Related Function Documentation

10.3.2.1 int ppl_Artificial_Parameter_Sequence_const_iterator_dereference (ppl_const_-Artificial_Parameter_Sequence_const_iterator_t *apit*, ppl_const_Artificial_Parameter_t * *pap*) [related]

Dereference `apit` writing a const handle to the resulting artificial parameter at address `pap`.

Definition at line 2561 of file ppl_c_implementation_common.cc.

10.3.2.2 int ppl_Artificial_Parameter_Sequence_const_iterator_equal_test (ppl_const_Artificial_Parameter_Sequence_const_iterator_t *x*, ppl_const_Artificial_Parameter_Sequence_const_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

Definition at line 2581 of file ppl_c_implementation_common.cc.

10.3.2.3 int ppl_Artificial_Parameter_Sequence_const_iterator_increment (ppl_Artificial_Parameter_Sequence_const_iterator_t *apit*) [related]

Increment `apit` so that it "points" to the next artificial parameter.

Definition at line 2572 of file ppl_c_implementation_common.cc.

10.3.2.4 int ppl_assign_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t *dst*, ppl_const_Artificial_Parameter_Sequence_const_iterator_t *src*) [related]

Assigns a copy of the const iterator `src` to `dst`.

Definition at line 2550 of file ppl_c_implementation_common.cc.

10.3.2.5 int ppl_delete_Artificial_Parameter_Sequence_const_iterator (ppl_const_Artificial_Parameter_Sequence_const_iterator_t *apit*) [related]

Invalidates the handle `apit`: this makes sure the corresponding resources will eventually be released.

Definition at line 2541 of file ppl_c_implementation_common.cc.

10.3.2.6 int ppl_new_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t * *papit*) [related]

Builds a new 'const iterator' and writes a handle to it at address `papit`.

Definition at line 2524 of file ppl_c_implementation_common.cc.

10.3.2.7 int ppl_new_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_-Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t * *papit*, ppl_const_Artificial_Parameter_Sequence_const_iterator_t *apit*) [related]

Builds a const iterator that is a copy of `apit`; writes a handle for the newly created const iterator at address `papit`.

Definition at line 2532 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.4 ppl_Artificial_Parameter_tag Interface Reference

Types and functions for PIP artificial parameters.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

- int ppl_Artificial_Parameter_get_Linear_Expression (ppl_const_Artificial_Parameter_t ap, ppl_-Linear_Expression_t le)

  Copies into `le` the linear expression in artificial parameter `ap`.

- int ppl_Artificial_Parameter_coefficient (ppl_const_Artificial_Parameter_t ap, ppl_dimension_type var, ppl_Coefficient_t n)

  Copies into `n` the coefficient of variable `var` in the artificial parameter `ap`.

- int ppl_Artificial_Parameter_get_inhomogeneous_term (ppl_const_Artificial_Parameter_t ap, ppl_-Coefficient_t n)

  Copies into `n` the inhomogeneous term of the artificial parameter `ap`.

- int ppl_Artificial_Parameter_denominator (ppl_const_Artificial_Parameter_t ap, ppl_Coefficient_t n)

  Copies into `n` the denominator in artificial parameter `ap`.

10.4.1 Detailed Description

Types and functions for PIP artificial parameters. The types and functions for PIP artificial parameters provide an interface towards *Artificial_Parameter*.

10.4.2 Friends And Related Function Documentation

10.4.2.1 int ppl_Artificial_Parameter_coefficient (ppl_const_Artificial_Parameter_t *ap*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Copies into `n` the coefficient of variable `var` in the artificial parameter `ap`.

Definition at line 2488 of file ppl_c_implementation_common.cc.

10.4.2.2 int ppl_Artificial_Parameter_denominator (ppl_const_Artificial_Parameter_t *ap*, ppl_Coefficient_t *n*) [related]

Copies into `n` the denominator in artificial parameter `ap`.

Definition at line 2510 of file ppl_c_implementation_common.cc.

10.4.2.3 int ppl_Artificial_Parameter_get_inhomogeneous_term (ppl_const_Artificial_Parameter_t *ap*, ppl_Coefficient_t *n*) [related]

Copies into `n` the inhomogeneous term of the artificial parameter `ap`.

10.4.2.4 int ppl_Artificial_Parameter_get_Linear_Expression (ppl_const_Artificial_Parameter_t *ap*, ppl_Linear_Expression_t *le*) [related]

Copies into `le` the linear expression in artificial parameter `ap`.

Definition at line 2478 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.5 ppl_Coefficient_tag Interface Reference

Types and functions for coefficients.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Coefficient (ppl_Coefficient_t *pc)
  Creates a new coefficient with value 0 and writes a handle for the newly created coefficient at address `pc`.
- int ppl_new_Coefficient_from_mpz_t (ppl_Coefficient_t *pc, mpz_t z)
  Creates a new coefficient with the value given by the GMP integer `z` and writes a handle for the newly created coefficient at address `pc`.
- int ppl_new_Coefficient_from_Coefficient (ppl_Coefficient_t *pc, ppl_const_Coefficient_t c)

Builds a coefficient that is a copy of `c`*; writes a handle for the newly created coefficient at address* `pc`*.*

- int ppl_assign_Coefficient_from_mpz_t (ppl_Coefficient_t dst, mpz_t z)
  Assign to `dst` *the value given by the GMP integer* `z`*.*
- int ppl_assign_Coefficient_from_Coefficient (ppl_Coefficient_t dst, ppl_const_Coefficient_t src)
  Assigns a copy of the coefficient `src` *to* `dst`*.*
- int ppl_delete_Coefficient (ppl_const_Coefficient_t c)
  Invalidates the handle `c`*: this makes sure the corresponding resources will eventually be released.*

Read-Only Accessor Functions

- int ppl_Coefficient_to_mpz_t (ppl_const_Coefficient_t c, mpz_t z)
  Sets the value of the GMP integer `z` *to the value of* `c`*.*
- int ppl_Coefficient_OK (ppl_const_Coefficient_t c)
  Returns a positive integer if `c` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `c` *is broken. Useful for debugging purposes.*
- int ppl_Coefficient_is_bounded (void)
  Returns a positive integer if coefficients are bounded; returns 0 otherwise.
- int ppl_Coefficient_min (mpz_t min)
  Returns a positive integer if coefficients are bounded, in which case `min` *is set to their minimum value; returns 0 otherwise.*
- int ppl_Coefficient_max (mpz_t max)
  Returns a positive integer if coefficients are bounded, in which case `max` *is set to their maximum value; returns 0 otherwise.*

10.5.1 Detailed Description

Types and functions for coefficients. The types and functions for coefficients provide an interface towards *Coefficient*. Depending on configuration, the PPL coefficients may be implemented by the unbounded precision integers provided by GMP (default), or by bounded precision integers (with checks for overflows).

10.5.2 Friends And Related Function Documentation

10.5.2.1 int ppl_assign_Coefficient_from_Coefficient (ppl_Coefficient_t *dst*, ppl_const_Coefficient_t *src*) [related]

Assigns a copy of the coefficient `src` to `dst`.

Definition at line 442 of file ppl_c_implementation_common.cc.

10.5.2.2 int ppl_assign_Coefficient_from_mpz_t (ppl_Coefficient_t *dst*, mpz_t *z*) [related]

Assign to `dst` the value given by the GMP integer `z`.

Definition at line 434 of file ppl_c_implementation_common.cc.

10.5.2.3 int ppl_Coefficient_is_bounded (void) [related]

Returns a positive integer if coefficients are bounded; returns 0 otherwise.

Definition at line 458 of file ppl_c_implementation_common.cc.

10.5.2.4 int ppl_Coefficient_max (mpz_t *max*) [related]

Returns a positive integer if coefficients are bounded, in which case `max` is set to their maximum value; returns 0 otherwise.

Definition at line 477 of file ppl_c_implementation_common.cc.

10.5.2.5 int ppl_Coefficient_min (mpz_t *min*) [related]

Returns a positive integer if coefficients are bounded, in which case `min` is set to their minimum value; returns 0 otherwise.

Definition at line 464 of file ppl_c_implementation_common.cc.

10.5.2.6 int ppl_Coefficient_OK (ppl_const_Coefficient_t *c*) [related]

Returns a positive integer if `c` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `c` is broken. Useful for debugging purposes.

Definition at line 452 of file ppl_c_implementation_common.cc.

10.5.2.7 int ppl_Coefficient_to_mpz_t (ppl_const_Coefficient_t *c*, mpz_t *z*) [related]

Sets the value of the GMP integer `z` to the value of `c`.

Definition at line 420 of file ppl_c_implementation_common.cc.

10.5.2.8 int ppl_delete_Coefficient (ppl_const_Coefficient_t *c*) [related]

Invalidates the handle `c`: this makes sure the corresponding resources will eventually be released.

Definition at line 427 of file ppl_c_implementation_common.cc.

10.5.2.9 int ppl_new_Coefficient (ppl_Coefficient_t * *pc*) [related]

Creates a new coefficient with value 0 and writes a handle for the newly created coefficient at address `pc`.

Definition at line 397 of file ppl_c_implementation_common.cc.

10.5.2.10 int ppl_new_Coefficient_from_Coefficient (ppl_Coefficient_t * *pc*, ppl_const_Coefficient_t *c*) [related]

Builds a coefficient that is a copy of `c`; writes a handle for the newly created coefficient at address `pc`.

Definition at line 411 of file ppl_c_implementation_common.cc.

10.5.2.11 int ppl_new_Coefficient_from_mpz_t (ppl_Coefficient_t * *pc*, mpz_t *z*) [related]

Creates a new coefficient with the value given by the GMP integer `z` and writes a handle for the newly created coefficient at address `pc`.

Definition at line 404 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.6 ppl_Congruence_System_const_iterator_tag Interface Reference

Types and functions for iterating on congruence systems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t *pcit)

  Builds a new 'const iterator' and writes a handle to it at address `pcit`.

- int ppl_new_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t *pcit, ppl_const_Congruence_System_const_iterator_t cit)

  Builds a const iterator that is a copy of `cit`; writes a handle for the newly created const iterator at address `pcit`.

- int ppl_assign_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t dst, ppl_const_Congruence_System_const_iterator_t src)

Assigns a copy of the const iterator `src` *to* `dst`.

- int ppl_delete_Congruence_System_const_iterator (ppl_const_Congruence_System_const_iterator_t cit)

  Invalidates the handle `cit`*: this makes sure the corresponding resources will eventually be released.*

Dereferencing, Incrementing and Equality Testing

- int ppl_Congruence_System_const_iterator_dereference (ppl_const_Congruence_System_const_iterator_t cit, ppl_const_Congruence_t *pc)

  Dereference `cit` *writing a const handle to the resulting congruence at address* `pc`.

- int ppl_Congruence_System_const_iterator_increment (ppl_Congruence_System_const_iterator_t cit)

  Increment `cit` *so that it "points" to the next congruence.*

- int ppl_Congruence_System_const_iterator_equal_test (ppl_const_Congruence_System_const_iterator_t x, ppl_const_Congruence_System_const_iterator_t y)

  Returns a positive integer if the iterators corresponding to `x` *and* `y` *are equal; returns 0 if they are different.*

10.6.1 Detailed Description

Types and functions for iterating on congruence systems. The types and functions for congruence systems iterators provide read-only access to the elements of a congruence system by interfacing *Congruence_System::const_iterator*.

10.6.2 Friends And Related Function Documentation

10.6.2.1 int ppl_assign_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t *dst*, ppl_const_Congruence_System_const_iterator_t *src*) [related]

Assigns a copy of the const iterator `src` to `dst`.

Definition at line 1496 of file ppl_c_implementation_common.cc.

10.6.2.2 int ppl_Congruence_System_const_iterator_dereference (ppl_const_Congruence_System_const_iterator_t *cit*, ppl_const_Congruence_t * *pc*) [related]

Dereference `cit` writing a const handle to the resulting congruence at address `pc`.

Definition at line 1527 of file ppl_c_implementation_common.cc.

10.6.2.3 int ppl_Congruence_System_const_iterator_equal_test (ppl_const_Congruence_System_const_iterator_t *x*, ppl_const_Congruence_System_const_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

Definition at line 1547 of file ppl_c_implementation_common.cc.

10.6.2.4 int ppl_Congruence_System_const_iterator_increment (ppl_Congruence_System_const_iterator_t *cit*) [related]

Increment `cit` so that it "points" to the next congruence.

Definition at line 1538 of file ppl_c_implementation_common.cc.

10.6.2.5 int ppl_delete_Congruence_System_const_iterator (ppl_const_Congruence_System_const_iterator_t *cit*) [related]

Invalidates the handle `cit`: this makes sure the corresponding resources will eventually be released.

Definition at line 1487 of file ppl_c_implementation_common.cc.

10.6.2.6 int ppl_new_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t * *pcit*) [related]

Builds a new 'const iterator' and writes a handle to it at address `pcit`.

Definition at line 1470 of file ppl_c_implementation_common.cc.

10.6.2.7 int ppl_new_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t * *pcit*, ppl_const_Congruence_System_const_iterator_t *cit*) [related]

Builds a const iterator that is a copy of `cit`; writes a handle for the newly created const iterator at address `pcit`.

Definition at line 1478 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.7 ppl_Congruence_System_tag Interface Reference

Types and functions for congruence systems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Congruence_System (ppl_Congruence_System_t *pcs)
  Builds an empty system of congruences and writes a handle to it at address `pcs`.
- int ppl_new_Congruence_System_zero_dim_empty (ppl_Congruence_System_t *pcs)
  Builds a zero-dimensional, unsatisfiable congruence system and writes a handle to it at address `pcs`.
- int ppl_new_Congruence_System_from_Congruence (ppl_Congruence_System_t *pcs, ppl_const_Congruence_t c)
  Builds the singleton congruence system containing only a copy of congruence `c`*; writes a handle for the newly created system at address* `pcs`.
- int ppl_new_Congruence_System_from_Congruence_System (ppl_Congruence_System_t *pcs, ppl_const_Congruence_System_t cs)
  Builds a congruence system that is a copy of `cs`*; writes a handle for the newly created system at address* `pcs`.
- int ppl_assign_Congruence_System_from_Congruence_System (ppl_Congruence_System_t dst, ppl_const_Congruence_System_t src)
  Assigns a copy of the congruence system `src` *to* `dst`.
- int ppl_delete_Congruence_System (ppl_const_Congruence_System_t cs)
  Invalidates the handle `cs`*: this makes sure the corresponding resources will eventually be released.*

Functions that Do Not Modify the Congruence System

- int ppl_Congruence_System_space_dimension (ppl_const_Congruence_System_t cs, ppl_dimension_type *m)
  Writes to `m` *the dimension of the vector space enclosing* `cs`.
- int ppl_Congruence_System_empty (ppl_const_Congruence_System_t cs)
  Returns a positive integer if `cs` *contains no (non-trivial) congruence; returns 0 otherwise.*
- int ppl_Congruence_System_begin (ppl_const_Congruence_System_t cs, ppl_Congruence_System_const_iterator_t cit)
  Assigns to `cit` *a const iterator "pointing" to the beginning of the congruence system* `cs`.
- int ppl_Congruence_System_end (ppl_const_Congruence_System_t cs, ppl_Congruence_System_const_iterator_t cit)
  Assigns to `cit` *a const iterator "pointing" past the end of the congruence system* `cs`.
- int ppl_Congruence_System_OK (ppl_const_Congruence_System_t cs)
  Returns a positive integer if `cs` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `cs` *is broken. Useful for debugging purposes.*

Functions that May Modify the Congruence System

- int ppl_Congruence_System_clear (ppl_Congruence_System_t cs)

Removes all the congruences from the congruence system `cs` *and sets its space dimension to 0.*

- int ppl_Congruence_System_insert_Congruence (ppl_Congruence_System_t cs, ppl_const_Congruence_t c)

  Inserts a copy of the congruence `c` *into* `cs`*; the space dimension is increased, if necessary.*

10.7.1 Detailed Description

Types and functions for congruence systems. The types and functions for congruence systems provide an interface towards *Congruence_System*.

10.7.2 Friends And Related Function Documentation

10.7.2.1 int ppl_assign_Congruence_System_from_Congruence_System (ppl_Congruence_System_t *dst*, ppl_const_Congruence_System_t *src*) [related]

Assigns a copy of the congruence system `src` to `dst`.

Definition at line 1419 of file ppl_c_implementation_common.cc.

10.7.2.2 int ppl_Congruence_System_begin (ppl_const_Congruence_System_t *cs*, ppl_Congruence_System_const_iterator_t *cit*) [related]

Assigns to `cit` a const iterator "pointing" to the beginning of the congruence system `cs`.

Definition at line 1506 of file ppl_c_implementation_common.cc.

10.7.2.3 int ppl_Congruence_System_clear (ppl_Congruence_System_t *cs*) [related]

Removes all the congruences from the congruence system `cs` and sets its space dimension to 0.

Definition at line 1444 of file ppl_c_implementation_common.cc.

10.7.2.4 int ppl_Congruence_System_empty (ppl_const_Congruence_System_t *cs*) [related]

Returns a positive integer if `cs` contains no (non-trivial) congruence; returns 0 otherwise.

Definition at line 1437 of file ppl_c_implementation_common.cc.

10.7.2.5 int ppl_Congruence_System_end (ppl_const_Congruence_System_t *cs*, ppl_Congruence_System_const_iterator_t *cit*) [related]

Assigns to `cit` a const iterator "pointing" past the end of the congruence system `cs`.

Definition at line 1516 of file ppl_c_implementation_common.cc.

10.7.2.6 int ppl_Congruence_System_insert_Congruence (ppl_Congruence_System_t *cs*, ppl_const_Congruence_t *c*) [related]

Inserts a copy of the congruence `c` into `cs`; the space dimension is increased, if necessary.

Definition at line 1451 of file ppl_c_implementation_common.cc.

10.7.2.7 int ppl_Congruence_System_OK (ppl_const_Congruence_System_t *cs*) [related]

Returns a positive integer if `cs` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `cs` is broken. Useful for debugging purposes.

Definition at line 1461 of file ppl_c_implementation_common.cc.

10.7.2.8 int ppl_Congruence_System_space_dimension (ppl_const_Congruence_System_t *cs*, ppl_dimension_type * *m*) [related]

Writes to `m` the dimension of the vector space enclosing `cs`.

Definition at line 1428 of file ppl_c_implementation_common.cc.

10.7.2.9 int ppl_delete_Congruence_System (ppl_const_Congruence_System_t *cs*) [related]

Invalidates the handle `cs`: this makes sure the corresponding resources will eventually be released.

Definition at line 1411 of file ppl_c_implementation_common.cc.

10.7.2.10 int ppl_new_Congruence_System (ppl_Congruence_System_t * *pcs*) [related]

Builds an empty system of congruences and writes a handle to it at address `pcs`.

Definition at line 1377 of file ppl_c_implementation_common.cc.

10.7.2.11 int ppl_new_Congruence_System_from_Congruence (ppl_Congruence_System_t * *pcs*, ppl_const_Congruence_t *c*) [related]

Builds the singleton congruence system containing only a copy of congruence `c`; writes a handle for the newly created system at address `pcs`.

Definition at line 1393 of file ppl_c_implementation_common.cc.

10.7.2.12 int ppl_new_Congruence_System_from_Congruence_System (ppl_Congruence_System_t * *pcs*, ppl_const_Congruence_System_t *cs*) [related]

Builds a congruence system that is a copy of `cs`; writes a handle for the newly created system at address `pcs`.

Definition at line 1403 of file ppl_c_implementation_common.cc.

10.7.2.13 int ppl_new_Congruence_System_zero_dim_empty (ppl_Congruence_System_t * *pcs*) [related]

Builds a zero-dimensional, unsatisfiable congruence system and writes a handle to it at address `pcs`.

Definition at line 1384 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.8 ppl_Congruence_tag Interface Reference

Types and functions for congruences.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Congruence (ppl_Congruence_t *pc, ppl_const_Linear_Expression_t le, ppl_const_Coefficient_t m)

  Creates the new congruence $le = 0 \pmod{m}$ *and writes a handle for it at address* `pc`*. The space dimension of the new congruence is equal to the space dimension of* `le`*.*

- int ppl_new_Congruence_zero_dim_false (ppl_Congruence_t *pc)

  Creates the unsatisfiable (zero-dimension space) congruence $0 = 1 \pmod{0}$ *and writes a handle for it at address* `pc`*.*

- int ppl_new_Congruence_zero_dim_integrality (ppl_Congruence_t *pc)

  Creates the true (zero-dimension space) congruence $0 = 1 \pmod{1}$*, also known as integrality congruence. A handle for the newly created congruence is written at address* `pc`*.*

- int ppl_new_Congruence_from_Congruence (ppl_Congruence_t *pc, ppl_const_Congruence_t c)

  Builds a congruence that is a copy of `c`*; writes a handle for the newly created congruence at address* `pc`*.*

- int ppl_assign_Congruence_from_Congruence (ppl_Congruence_t dst, ppl_const_Congruence_t src)

Assigns a copy of the congruence `src` *to* `dst`.

- int ppl_delete_Congruence (ppl_const_Congruence_t c)

  Invalidates the handle `c`*: this makes sure the corresponding resources will eventually be released.*

Functions that Do Not Modify the Congruence

- int ppl_Congruence_space_dimension (ppl_const_Congruence_t c, ppl_dimension_type *m)

  Writes to `m` *the space dimension of* `c`.

- int ppl_Congruence_coefficient (ppl_const_Congruence_t c, ppl_dimension_type var, ppl_-Coefficient_t n)

  Copies into `n` *the coefficient of variable* `var` *in congruence* `c`.

- int ppl_Congruence_inhomogeneous_term (ppl_const_Congruence_t c, ppl_Coefficient_t n)

  Copies into `n` *the inhomogeneous term of congruence* `c`.

- int ppl_Congruence_modulus (ppl_const_Congruence_t c, ppl_Coefficient_t m)

  Copies into `m` *the modulus of congruence* `c`.

- int ppl_Congruence_OK (ppl_const_Congruence_t c)

  Returns a positive integer if `c` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `c` *is broken. Useful for debugging purposes.*

10.8.1 Detailed Description

Types and functions for congruences. The types and functions for congruences provide an interface towards *Congruence*.

10.8.2 Friends And Related Function Documentation

10.8.2.1 int ppl_assign_Congruence_from_Congruence (ppl_Congruence_t *dst*, ppl_const_Congruence_t *src*) [related]

Assigns a copy of the congruence `src` to `dst`.

Definition at line 1311 of file ppl_c_implementation_common.cc.

10.8.2.2 int ppl_Congruence_coefficient (ppl_const_Congruence_t *c*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Copies into `n` the coefficient of variable `var` in congruence `c`.

Definition at line 1329 of file ppl_c_implementation_common.cc.

10.8.2.3 int ppl_Congruence_inhomogeneous_term (ppl_const_Congruence_t *c*, ppl_Coefficient_t *n*) [related]

Copies into n the inhomogeneous term of congruence c.

Definition at line 1340 of file ppl_c_implementation_common.cc.

10.8.2.4 int ppl_Congruence_modulus (ppl_const_Congruence_t *c*, ppl_Coefficient_t *m*) [related]

Copies into m the modulus of congruence c.

Definition at line 1350 of file ppl_c_implementation_common.cc.

10.8.2.5 int ppl_Congruence_OK (ppl_const_Congruence_t *c*) [related]

Returns a positive integer if c is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if c is broken. Useful for debugging purposes.

Definition at line 1360 of file ppl_c_implementation_common.cc.

10.8.2.6 int ppl_Congruence_space_dimension (ppl_const_Congruence_t *c*, ppl_dimension_type * *m*) [related]

Writes to m the space dimension of c.

Definition at line 1321 of file ppl_c_implementation_common.cc.

10.8.2.7 int ppl_delete_Congruence (ppl_const_Congruence_t *c*) [related]

Invalidates the handle c: this makes sure the corresponding resources will eventually be released.

Definition at line 1304 of file ppl_c_implementation_common.cc.

10.8.2.8 int ppl_new_Congruence (ppl_Congruence_t * *pc*, ppl_const_Linear_Expression_t *le*, ppl_const_Coefficient_t *m*) [related]

Creates the new congruence $le = 0 \pmod{m}$ and writes a handle for it at address pc. The space dimension of the new congruence is equal to the space dimension of le.

Definition at line 1268 of file ppl_c_implementation_common.cc.

10.8.2.9 int ppl_new_Congruence_from_Congruence (ppl_Congruence_t * *pc*, ppl_const_Congruence_t *c*) [related]

Builds a congruence that is a copy of `c`; writes a handle for the newly created congruence at address `pc`.

Definition at line 1295 of file ppl_c_implementation_common.cc.

10.8.2.10 int ppl_new_Congruence_zero_dim_false (ppl_Congruence_t * *pc*) [related]

Creates the unsatisfiable (zero-dimension space) congruence $0 = 1 \pmod 0$ and writes a handle for it at address `pc`.

Definition at line 1281 of file ppl_c_implementation_common.cc.

10.8.2.11 int ppl_new_Congruence_zero_dim_integrality (ppl_Congruence_t * *pc*) [related]

Creates the true (zero-dimension space) congruence $0 = 1 \pmod 1$, also known as *integrality congruence*. A handle for the newly created congruence is written at address `pc`.

Definition at line 1288 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.9 ppl_Constraint_System_const_iterator_tag Interface Reference

Types and functions for iterating on constraint systems.

```
#include <ppl_c_header.h>
```

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t *pcit)
  Builds a new 'const iterator' and writes a handle to it at address `pcit`.
- int ppl_new_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t *pcit, ppl_const_Constraint_System_const_iterator_t cit)
  Builds a const iterator that is a copy of `cit`; writes a handle for the newly created const iterator at address `pcit`.
- int ppl_assign_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t dst, ppl_const_Constraint_System_const_iterator_t src)
  Assigns a copy of the const iterator `src` to `dst`.

- int ppl_delete_Constraint_System_const_iterator (ppl_const_Constraint_System_const_-iterator_t cit)

  Invalidates the handle `cit`*: this makes sure the corresponding resources will eventually be released.*

Dereferencing, Incrementing and Equality Testing

- int ppl_Constraint_System_const_iterator_dereference (ppl_const_Constraint_System_const_-iterator_t cit, ppl_const_Constraint_t ∗pc)

  Dereference `cit` *writing a const handle to the resulting constraint at address* `pc`*.*

- int ppl_Constraint_System_const_iterator_increment (ppl_Constraint_System_const_iterator_-t cit)

  Increment `cit` *so that it "points" to the next constraint.*

- int ppl_Constraint_System_const_iterator_equal_test (ppl_const_Constraint_System_const_-iterator_t x, ppl_const_Constraint_System_const_iterator_t y)

  Returns a positive integer if the iterators corresponding to `x` *and* `y` *are equal; returns 0 if they are different.*

10.9.1 Detailed Description

Types and functions for iterating on constraint systems. The types and functions for constraint systems iterators provide read-only access to the elements of a constraint system by interfacing *Constraint_-System::const_iterator*.

10.9.2 Friends And Related Function Documentation

10.9.2.1 int ppl_assign_Constraint_System_const_iterator_from_Constraint_-System_const_iterator (ppl_Constraint_System_const_iterator_t *dst*, ppl_const_Constraint_System_const_iterator_t *src*) [related]

Assigns a copy of the const iterator `src` to `dst`.

Definition at line 895 of file ppl_c_implementation_common.cc.

10.9.2.2 int ppl_Constraint_System_const_iterator_dereference (ppl_const_-Constraint_System_const_iterator_t *cit*, ppl_const_Constraint_t ∗ *pc*) [related]

Dereference `cit` writing a const handle to the resulting constraint at address `pc`.

Definition at line 926 of file ppl_c_implementation_common.cc.

10.9.2.3 int ppl_Constraint_System_const_iterator_equal_test (ppl_const_Constraint_-System_const_iterator_t *x*, ppl_const_Constraint_System_const_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

Definition at line 946 of file ppl_c_implementation_common.cc.

10.9.2.4 int ppl_Constraint_System_const_iterator_increment (ppl_Constraint_System_const_iterator_t *cit*) [related]

Increment `cit` so that it "points" to the next constraint.

Definition at line 937 of file ppl_c_implementation_common.cc.

10.9.2.5 int ppl_delete_Constraint_System_const_iterator (ppl_const_Constraint_System_const_iterator_t *cit*) [related]

Invalidates the handle `cit`: this makes sure the corresponding resources will eventually be released.

Definition at line 886 of file ppl_c_implementation_common.cc.

10.9.2.6 int ppl_new_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t * *pcit*) [related]

Builds a new 'const iterator' and writes a handle to it at address `pcit`.

Definition at line 869 of file ppl_c_implementation_common.cc.

10.9.2.7 int ppl_new_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t * *pcit*, ppl_const_Constraint_System_const_iterator_t *cit*) [related]

Builds a const iterator that is a copy of `cit`; writes a handle for the newly created const iterator at address `pcit`.

Definition at line 877 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.10 ppl_Constraint_System_tag Interface Reference

Types and functions for constraint systems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Constraint_System (ppl_Constraint_System_t *pcs)
  Builds an empty system of constraints and writes a handle to it at address `pcs`.
- int ppl_new_Constraint_System_zero_dim_empty (ppl_Constraint_System_t *pcs)
  Builds a zero-dimensional, unsatisfiable constraint system and writes a handle to it at address `pcs`.
- int ppl_new_Constraint_System_from_Constraint (ppl_Constraint_System_t *pcs, ppl_const_Constraint_t c)
  Builds the singleton constraint system containing only a copy of constraint `c`*; writes a handle for the newly created system at address* `pcs`.
- int ppl_new_Constraint_System_from_Constraint_System (ppl_Constraint_System_t *pcs, ppl_const_Constraint_System_t cs)
  Builds a constraint system that is a copy of `cs`*; writes a handle for the newly created system at address* `pcs`.
- int ppl_assign_Constraint_System_from_Constraint_System (ppl_Constraint_System_t dst, ppl_const_Constraint_System_t src)
  Assigns a copy of the constraint system `src` *to* `dst`.
- int ppl_delete_Constraint_System (ppl_const_Constraint_System_t cs)
  Invalidates the handle `cs`*: this makes sure the corresponding resources will eventually be released.*

Functions that Do Not Modify the Constraint System

- int ppl_Constraint_System_space_dimension (ppl_const_Constraint_System_t cs, ppl_dimension_type *m)
  Writes to `m` *the dimension of the vector space enclosing* `cs`.
- int ppl_Constraint_System_empty (ppl_const_Constraint_System_t cs)
  Returns a positive integer if `cs` *contains no (non-trivial) constraint; returns 0 otherwise.*
- int ppl_Constraint_System_has_strict_inequalities (ppl_const_Constraint_System_t cs)
  Returns a positive integer if `cs` *contains any (non-trivial) strict inequality; returns 0 otherwise.*
- int ppl_Constraint_System_begin (ppl_const_Constraint_System_t cs, ppl_Constraint_System_const_iterator_t cit)
  Assigns to `cit` *a const iterator "pointing" to the beginning of the constraint system* `cs`.
- int ppl_Constraint_System_end (ppl_const_Constraint_System_t cs, ppl_Constraint_System_const_iterator_t cit)
  Assigns to `cit` *a const iterator "pointing" past the end of the constraint system* `cs`.
- int ppl_Constraint_System_OK (ppl_const_Constraint_System_t cs)
  Returns a positive integer if `cs` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `cs` *is broken. Useful for debugging purposes.*

Functions that May Modify the Constraint System

- int ppl_Constraint_System_clear (ppl_Constraint_System_t cs)
  Removes all the constraints from the constraint system `cs` *and sets its space dimension to 0.*

- int ppl_Constraint_System_insert_Constraint (ppl_Constraint_System_t cs, ppl_const_Constraint_t c)
  Inserts a copy of the constraint `c` into `cs`; the space dimension is increased, if necessary.

10.10.1 Detailed Description

Types and functions for constraint systems. The types and functions for constraint systems provide an interface towards *Constraint_System*.

10.10.2 Friends And Related Function Documentation

10.10.2.1 int ppl_assign_Constraint_System_from_Constraint_System (ppl_Constraint_System_t *dst*, ppl_const_Constraint_System_t *src*) [related]

Assigns a copy of the constraint system `src` to `dst`.

Definition at line 810 of file ppl_c_implementation_common.cc.

10.10.2.2 int ppl_Constraint_System_begin (ppl_const_Constraint_System_t *cs*, ppl_Constraint_System_const_iterator_t *cit*) [related]

Assigns to `cit` a const iterator "pointing" to the beginning of the constraint system `cs`.

Definition at line 905 of file ppl_c_implementation_common.cc.

10.10.2.3 int ppl_Constraint_System_clear (ppl_Constraint_System_t *cs*) [related]

Removes all the constraints from the constraint system `cs` and sets its space dimension to 0.

Definition at line 843 of file ppl_c_implementation_common.cc.

10.10.2.4 int ppl_Constraint_System_empty (ppl_const_Constraint_System_t *cs*) [related]

Returns a positive integer if `cs` contains no (non-trivial) constraint; returns 0 otherwise.

Definition at line 828 of file ppl_c_implementation_common.cc.

10.10.2.5 int ppl_Constraint_System_end (ppl_const_Constraint_System_t *cs*, ppl_Constraint_System_const_iterator_t *cit*) [related]

Assigns to `cit` a const iterator "pointing" past the end of the constraint system `cs`.

Definition at line 915 of file ppl_c_implementation_common.cc.

10.10.2.6 int ppl_Constraint_System_has_strict_inequalities (ppl_const_Constraint_System_t *cs*) [related]

Returns a positive integer if `cs` contains any (non-trivial) strict inequality; returns 0 otherwise.

Definition at line 836 of file ppl_c_implementation_common.cc.

10.10.2.7 int ppl_Constraint_System_insert_Constraint (ppl_Constraint_System_t *cs*, ppl_const_Constraint_t *c*) [related]

Inserts a copy of the constraint `c` into `cs`; the space dimension is increased, if necessary.

Definition at line 850 of file ppl_c_implementation_common.cc.

10.10.2.8 int ppl_Constraint_System_OK (ppl_const_Constraint_System_t *cs*) [related]

Returns a positive integer if `cs` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `cs` is broken. Useful for debugging purposes.

Definition at line 860 of file ppl_c_implementation_common.cc.

10.10.2.9 int ppl_Constraint_System_space_dimension (ppl_const_Constraint_System_t *cs*, ppl_dimension_type * *m*) [related]

Writes to `m` the dimension of the vector space enclosing `cs`.

Definition at line 819 of file ppl_c_implementation_common.cc.

10.10.2.10 int ppl_delete_Constraint_System (ppl_const_Constraint_System_t *cs*) [related]

Invalidates the handle `cs`: this makes sure the corresponding resources will eventually be released.

Definition at line 802 of file ppl_c_implementation_common.cc.

10.10.2.11 int ppl_new_Constraint_System (ppl_Constraint_System_t * *pcs*) [related]

Builds an empty system of constraints and writes a handle to it at address `pcs`.

Definition at line 768 of file ppl_c_implementation_common.cc.

10.10.2.12 int ppl_new_Constraint_System_from_Constraint (ppl_Constraint_System_t * *pcs*, ppl_const_Constraint_t *c*) [related]

Builds the singleton constraint system containing only a copy of constraint `c`; writes a handle for the newly created system at address `pcs`.

Definition at line 784 of file ppl_c_implementation_common.cc.

10.10.2.13 int ppl_new_Constraint_System_from_Constraint_System (ppl_Constraint_System_t * *pcs*, ppl_const_Constraint_System_t *cs*) [related]

Builds a constraint system that is a copy of `cs`; writes a handle for the newly created system at address `pcs`.

Definition at line 794 of file ppl_c_implementation_common.cc.

10.10.2.14 int ppl_new_Constraint_System_zero_dim_empty (ppl_Constraint_System_t * *pcs*) [related]

Builds a zero-dimensional, unsatisfiable constraint system and writes a handle to it at address `pcs`.

Definition at line 775 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.11 ppl_Constraint_tag Interface Reference

Types and functions for constraints.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Constraint (ppl_Constraint_t *pc, ppl_const_Linear_Expression_t le, enum ppl_enum_Constraint_Type rel)
  Creates the new constraint '`le rel 0`' and writes a handle for it at address `pc`. The space dimension of the new constraint is equal to the space dimension of `le`.
- int ppl_new_Constraint_zero_dim_false (ppl_Constraint_t *pc)
  Creates the unsatisfiable (zero-dimension space) constraint $0 = 1$ and writes a handle for it at address `pc`.
- int ppl_new_Constraint_zero_dim_positivity (ppl_Constraint_t *pc)
  Creates the true (zero-dimension space) constraint $0 \leq 1$, also known as positivity constraint. A handle for the newly created constraint is written at address `pc`.
- int ppl_new_Constraint_from_Constraint (ppl_Constraint_t *pc, ppl_const_Constraint_t c)
  Builds a constraint that is a copy of `c`; writes a handle for the newly created constraint at address `pc`.

- int ppl_assign_Constraint_from_Constraint (ppl_Constraint_t dst, ppl_const_Constraint_t src)
  Assigns a copy of the constraint `src` to `dst`.

- int ppl_delete_Constraint (ppl_const_Constraint_t c)
  Invalidates the handle `c`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the Constraint

- int ppl_Constraint_space_dimension (ppl_const_Constraint_t c, ppl_dimension_type *m)
  Writes to `m` the space dimension of `c`.

- int ppl_Constraint_type (ppl_const_Constraint_t c)
  Returns the type of constraint `c`.

- int ppl_Constraint_coefficient (ppl_const_Constraint_t c, ppl_dimension_type var, ppl_-Coefficient_t n)
  Copies into `n` the coefficient of variable `var` in constraint `c`.

- int ppl_Constraint_inhomogeneous_term (ppl_const_Constraint_t c, ppl_Coefficient_t n)
  Copies into `n` the inhomogeneous term of constraint `c`.

- int ppl_Constraint_OK (ppl_const_Constraint_t c)
  Returns a positive integer if `c` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `c` is broken. Useful for debugging purposes.

10.11.1 Detailed Description

Types and functions for constraints. The types and functions for constraints provide an interface towards *Constraint*.

10.11.2 Friends And Related Function Documentation

10.11.2.1 int ppl_assign_Constraint_from_Constraint (ppl_Constraint_t *dst*, ppl_const_Constraint_t *src*) [related]

Assigns a copy of the constraint `src` to `dst`.

Definition at line 697 of file ppl_c_implementation_common.cc.

10.11.2.2 int ppl_Constraint_coefficient (ppl_const_Constraint_t *c*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Copies into `n` the coefficient of variable `var` in constraint `c`.

Definition at line 730 of file ppl_c_implementation_common.cc.

10.11.2.3 int ppl_Constraint_inhomogeneous_term (ppl_const_Constraint_t *c*, ppl_Coefficient_t *n*) [related]

Copies into `n` the inhomogeneous term of constraint `c`.

Definition at line 741 of file ppl_c_implementation_common.cc.

10.11.2.4 int ppl_Constraint_OK (ppl_const_Constraint_t *c*) [related]

Returns a positive integer if `c` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `c` is broken. Useful for debugging purposes.

Definition at line 751 of file ppl_c_implementation_common.cc.

10.11.2.5 int ppl_Constraint_space_dimension (ppl_const_Constraint_t *c*, ppl_dimension_type * *m*) [related]

Writes to `m` the space dimension of `c`.

Definition at line 707 of file ppl_c_implementation_common.cc.

10.11.2.6 int ppl_Constraint_type (ppl_const_Constraint_t *c*) [related]

Returns the type of constraint `c`.

Definition at line 715 of file ppl_c_implementation_common.cc.

10.11.2.7 int ppl_delete_Constraint (ppl_const_Constraint_t *c*) [related]

Invalidates the handle `c`: this makes sure the corresponding resources will eventually be released.

Definition at line 690 of file ppl_c_implementation_common.cc.

10.11.2.8 int ppl_new_Constraint (ppl_Constraint_t * *pc*, ppl_const_Linear_Expression_t *le*, enum ppl_enum_Constraint_Type *rel*) [related]

Creates the new constraint '`le rel 0`' and writes a handle for it at address `pc`. The space dimension of the new constraint is equal to the space dimension of `le`.

Definition at line 636 of file ppl_c_implementation_common.cc.

10.11.2.9 int ppl_new_Constraint_from_Constraint (ppl_Constraint_t * *pc*, ppl_const_Constraint_t *c*) [related]

Builds a constraint that is a copy of `c`; writes a handle for the newly created constraint at address `pc`.

Definition at line 681 of file ppl_c_implementation_common.cc.

10.11.2.10 int ppl_new_Constraint_zero_dim_false (ppl_Constraint_t * *pc*) [related]

Creates the unsatisfiable (zero-dimension space) constraint $0 = 1$ and writes a handle for it at address `pc`.

Definition at line 667 of file ppl_c_implementation_common.cc.

10.11.2.11 int ppl_new_Constraint_zero_dim_positivity (ppl_Constraint_t * *pc*) [related]

Creates the true (zero-dimension space) constraint $0 \leq 1$, also known as *positivity constraint*. A handle for the newly created constraint is written at address `pc`.

Definition at line 674 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.12 ppl_Generator_System_const_iterator_tag Interface Reference

Types and functions for iterating on generator systems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t *pgit)
  Builds a new 'const iterator' and writes a handle to it at address `pgit`.
- int ppl_new_Generator_System_const_iterator_from_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t *pgit, ppl_const_Generator_System_const_iterator_t git)
  Builds a const iterator that is a copy of `git`; writes a handle for the newly created const iterator at address `pgit`.
- int ppl_assign_Generator_System_const_iterator_from_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t dst, ppl_const_Generator_System_const_iterator_t src)
  Assigns a copy of the const iterator `src` to `dst`.

- int ppl_delete_Generator_System_const_iterator (ppl_const_Generator_System_const_iterator_t git)

  Invalidates the handle `git`: this makes sure the corresponding resources will eventually be released.

Dereferencing, Incrementing and Equality Testing

- int ppl_Generator_System_const_iterator_dereference (ppl_const_Generator_System_const_iterator_t git, ppl_const_Generator_t *pg)

  Dereference `git` writing a const handle to the resulting generator at address `pg`.

- int ppl_Generator_System_const_iterator_increment (ppl_Generator_System_const_iterator_t git)

  Increment `git` so that it "points" to the next generator.

- int ppl_Generator_System_const_iterator_equal_test (ppl_const_Generator_System_const_iterator_t x, ppl_const_Generator_System_const_iterator_t y)

  Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

10.12.1 Detailed Description

Types and functions for iterating on generator systems. The types and functions for generator systems iterators provide read-only access to the elements of a generator system by interfacing *Generator_System::const_iterator*.

10.12.2 Friends And Related Function Documentation

10.12.2.1 int ppl_assign_Generator_System_const_iterator_from_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t *dst*, ppl_const_Generator_System_const_iterator_t *src*) [related]

Assigns a copy of the const iterator `src` to `dst`.

Definition at line 1206 of file ppl_c_implementation_common.cc.

10.12.2.2 int ppl_delete_Generator_System_const_iterator (ppl_const_Generator_System_const_iterator_t *git*) [related]

Invalidates the handle `git`: this makes sure the corresponding resources will eventually be released.

Definition at line 1198 of file ppl_c_implementation_common.cc.

10.12.2.3 int ppl_Generator_System_const_iterator_dereference (ppl_const_Generator_System_const_iterator_t *git*, ppl_const_Generator_t * *pg*) [related]

Dereference `git` writing a const handle to the resulting generator at address `pg`.

Definition at line 1237 of file ppl_c_implementation_common.cc.

10.12.2.4 int ppl_Generator_System_const_iterator_equal_test (ppl_const_Generator_System_const_iterator_t *x*, ppl_const_Generator_System_const_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

Definition at line 1257 of file ppl_c_implementation_common.cc.

10.12.2.5 int ppl_Generator_System_const_iterator_increment (ppl_Generator_System_const_iterator_t *git*) [related]

Increment `git` so that it "points" to the next generator.

Definition at line 1248 of file ppl_c_implementation_common.cc.

10.12.2.6 int ppl_new_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t * *pgit*) [related]

Builds a new 'const iterator' and writes a handle to it at address `pgit`.

Definition at line 1181 of file ppl_c_implementation_common.cc.

10.12.2.7 int ppl_new_Generator_System_const_iterator_from_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t * *pgit*, ppl_const_Generator_System_const_iterator_t *git*) [related]

Builds a const iterator that is a copy of `git`; writes a handle for the newly created const iterator at address `pgit`.

Definition at line 1189 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.13 ppl_Generator_System_tag Interface Reference

Types and functions for generator systems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Generator_System (ppl_Generator_System_t *pgs)
  Builds an empty system of generators and writes a handle to it at address `pgs`.
- int ppl_new_Generator_System_from_Generator (ppl_Generator_System_t *pgs, ppl_const_Generator_t g)
  Builds the singleton generator system containing only a copy of generator `g`; writes a handle for the newly created system at address `pgs`.
- int ppl_new_Generator_System_from_Generator_System (ppl_Generator_System_t *pgs, ppl_const_Generator_System_t gs)
  Builds a generator system that is a copy of `gs`; writes a handle for the newly created system at address `pgs`.
- int ppl_assign_Generator_System_from_Generator_System (ppl_Generator_System_t dst, ppl_const_Generator_System_t src)
  Assigns a copy of the generator system `src` to `dst`.
- int ppl_delete_Generator_System (ppl_const_Generator_System_t gs)
  Invalidates the handle `gs`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the Generator System

- int ppl_Generator_System_space_dimension (ppl_const_Generator_System_t gs, ppl_dimension_type *m)
  Writes to `m` the dimension of the vector space enclosing `gs`.
- int ppl_Generator_System_empty (ppl_const_Generator_System_t gs)
  Returns a positive integer if `gs` contains no generators; returns 0 otherwise.
- int ppl_Generator_System_begin (ppl_const_Generator_System_t gs, ppl_Generator_System_const_iterator_t git)
  Assigns to `git` a const iterator "pointing" to the beginning of the generator system `gs`.
- int ppl_Generator_System_end (ppl_const_Generator_System_t gs, ppl_Generator_System_const_iterator_t git)
  Assigns to `git` a const iterator "pointing" past the end of the generator system `gs`.
- int ppl_Generator_System_OK (ppl_const_Generator_System_t gs)
  Returns a positive integer if `gs` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `gs` is broken. Useful for debugging purposes.

Functions that May Modify the Generator System

- int ppl_Generator_System_clear (ppl_Generator_System_t gs)
  Removes all the generators from the generator system `gs` and sets its space dimension to 0.
- int ppl_Generator_System_insert_Generator (ppl_Generator_System_t gs, ppl_const_Generator_t g)
  Inserts a copy of the generator `g` into `gs`; the space dimension is increased, if necessary.

10.13.1 Detailed Description

Types and functions for generator systems. The types and functions for generator systems provide an interface towards *Generator_System*.

10.13.2 Friends And Related Function Documentation

10.13.2.1 int ppl_assign_Generator_System_from_Generator_System (ppl_Generator_System_t *dst*, ppl_const_Generator_System_t *src*) [related]

Assigns a copy of the generator system `src` to `dst`.

Definition at line 1130 of file ppl_c_implementation_common.cc.

10.13.2.2 int ppl_delete_Generator_System (ppl_const_Generator_System_t *gs*) [related]

Invalidates the handle `gs`: this makes sure the corresponding resources will eventually be released.

Definition at line 1122 of file ppl_c_implementation_common.cc.

10.13.2.3 int ppl_Generator_System_begin (ppl_const_Generator_System_t *gs*, ppl_Generator_System_const_iterator_t *git*) [related]

Assigns to `git` a const iterator "pointing" to the beginning of the generator system `gs`.

Definition at line 1216 of file ppl_c_implementation_common.cc.

10.13.2.4 int ppl_Generator_System_clear (ppl_Generator_System_t *gs*) [related]

Removes all the generators from the generator system `gs` and sets its space dimension to 0.

Definition at line 1155 of file ppl_c_implementation_common.cc.

10.13.2.5 int ppl_Generator_System_empty (ppl_const_Generator_System_t *gs*) [related]

Returns a positive integer if `gs` contains no generators; returns 0 otherwise.

Definition at line 1148 of file ppl_c_implementation_common.cc.

10.13.2.6 int ppl_Generator_System_end (ppl_const_Generator_System_t *gs*, ppl_Generator_System_const_iterator_t *git*) [related]

Assigns to `git` a const iterator "pointing" past the end of the generator system `gs`.

Definition at line 1226 of file ppl_c_implementation_common.cc.

10.13.2.7 int ppl_Generator_System_insert_Generator (ppl_Generator_System_t *gs*, ppl_const_Generator_t *g*) [related]

Inserts a copy of the generator `g` into `gs`; the space dimension is increased, if necessary.

Definition at line 1162 of file ppl_c_implementation_common.cc.

10.13.2.8 int ppl_Generator_System_OK (ppl_const_Generator_System_t *gs*) [related]

Returns a positive integer if `gs` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `gs` is broken. Useful for debugging purposes.

Definition at line 1172 of file ppl_c_implementation_common.cc.

10.13.2.9 int ppl_Generator_System_space_dimension (ppl_const_Generator_System_t *gs*, ppl_dimension_type * *m*) [related]

Writes to `m` the dimension of the vector space enclosing `gs`.

Definition at line 1139 of file ppl_c_implementation_common.cc.

10.13.2.10 int ppl_new_Generator_System (ppl_Generator_System_t * *pgs*) [related]

Builds an empty system of generators and writes a handle to it at address `pgs`.

Definition at line 1090 of file ppl_c_implementation_common.cc.

10.13.2.11 int ppl_new_Generator_System_from_Generator (ppl_Generator_System_t * *pgs*, ppl_const_Generator_t *g*) [related]

Builds the singleton generator system containing only a copy of generator `g`; writes a handle for the newly created system at address `pgs`.

Definition at line 1104 of file ppl_c_implementation_common.cc.

10.13.2.12 int ppl_new_Generator_System_from_Generator_System (ppl_Generator_System_t * *pgs*, ppl_const_Generator_System_t *gs*) [related]

Builds a generator system that is a copy of `gs`; writes a handle for the newly created system at address `pgs`.

Definition at line 1114 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.14 ppl_Generator_tag Interface Reference

Types and functions for generators.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Generator (ppl_Generator_t *pg, ppl_const_Linear_Expression_t le, enum ppl_enum_Generator_Type t, ppl_const_Coefficient_t d)
  Creates a new generator of direction `le` and type `t`. If the generator to be created is a point or a closure point, the divisor `d` is applied to `le`. For other types of generators `d` is simply disregarded. A handle for the new generator is written at address `pg`. The space dimension of the new generator is equal to the space dimension of `le`.

- int ppl_new_Generator_zero_dim_point (ppl_Generator_t *pg)
  Creates the point that is the origin of the zero-dimensional space $\mathbb{R}^0$. Writes a handle for the new generator at address `pg`.

- int ppl_new_Generator_zero_dim_closure_point (ppl_Generator_t *pg)
  Creates, as a closure point, the point that is the origin of the zero-dimensional space $\mathbb{R}^0$. Writes a handle for the new generator at address `pg`.

- int ppl_new_Generator_from_Generator (ppl_Generator_t *pg, ppl_const_Generator_t g)
  Builds a generator that is a copy of `g`; writes a handle for the newly created generator at address `pg`.

- int ppl_assign_Generator_from_Generator (ppl_Generator_t dst, ppl_const_Generator_t src)
  Assigns a copy of the generator `src` to `dst`.

- int ppl_delete_Generator (ppl_const_Generator_t g)
  Invalidates the handle `g`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the Generator

- int ppl_Generator_space_dimension (ppl_const_Generator_t g, ppl_dimension_type *m)
  Writes to `m` the space dimension of `g`.

- int ppl_Generator_type (ppl_const_Generator_t g)
  Returns the type of generator `g`.

- int ppl_Generator_coefficient (ppl_const_Generator_t g, ppl_dimension_type var, ppl_Coefficient_t n)
  Copies into `n` the coefficient of variable `var` in generator `g`.

- int ppl_Generator_divisor (ppl_const_Generator_t g, ppl_Coefficient_t n)

If `g` *is a point or a closure point assigns its divisor to* `n`*.*

- int ppl_Generator_OK (ppl_const_Generator_t g)

  Returns a positive integer if `g` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `g` *is broken. Useful for debugging purposes.*

10.14.1 Detailed Description

Types and functions for generators. The types and functions for generators provide an interface towards *Generator*.

10.14.2 Friends And Related Function Documentation

10.14.2.1 int ppl_assign_Generator_from_Generator (ppl_Generator_t *dst*, ppl_const_Generator_t *src*) [related]

Assigns a copy of the generator `src` to `dst`.

Definition at line 1017 of file ppl_c_implementation_common.cc.

10.14.2.2 int ppl_delete_Generator (ppl_const_Generator_t *g*) [related]

Invalidates the handle `g`: this makes sure the corresponding resources will eventually be released.

Definition at line 1010 of file ppl_c_implementation_common.cc.

10.14.2.3 int ppl_Generator_coefficient (ppl_const_Generator_t *g*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Copies into `n` the coefficient of variable `var` in generator `g`.

Definition at line 1052 of file ppl_c_implementation_common.cc.

10.14.2.4 int ppl_Generator_divisor (ppl_const_Generator_t *g*, ppl_Coefficient_t *n*) [related]

If `g` is a point or a closure point assigns its divisor to `n`.

Definition at line 1063 of file ppl_c_implementation_common.cc.

10.14.2.5 int ppl_Generator_OK (ppl_const_Generator_t *g*) [related]

Returns a positive integer if g is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if g is broken. Useful for debugging purposes.

Definition at line 1073 of file ppl_c_implementation_common.cc.

10.14.2.6 int ppl_Generator_space_dimension (ppl_const_Generator_t *g*, ppl_dimension_type * *m*) [related]

Writes to m the space dimension of g.

Definition at line 1027 of file ppl_c_implementation_common.cc.

10.14.2.7 int ppl_Generator_type (ppl_const_Generator_t *g*) [related]

Returns the type of generator g.

Definition at line 1035 of file ppl_c_implementation_common.cc.

10.14.2.8 int ppl_new_Generator (ppl_Generator_t * *pg*, ppl_const_Linear_Expression_t *le*, enum ppl_enum_Generator_Type *t*, ppl_const_Coefficient_t *d*) [related]

Creates a new generator of direction le and type t. If the generator to be created is a point or a closure point, the divisor d is applied to le. For other types of generators d is simply disregarded. A handle for the new generator is written at address pg. The space dimension of the new generator is equal to the space dimension of le.

Definition at line 957 of file ppl_c_implementation_common.cc.

10.14.2.9 int ppl_new_Generator_from_Generator (ppl_Generator_t * *pg*, ppl_const_Generator_t *g*) [related]

Builds a generator that is a copy of g; writes a handle for the newly created generator at address pg.

Definition at line 1001 of file ppl_c_implementation_common.cc.

10.14.2.10 int ppl_new_Generator_zero_dim_closure_point (ppl_Generator_t * *pg*) [related]

Creates, as a closure point, the point that is the origin of the zero-dimensional space $\mathbb{R}^0$. Writes a handle for the new generator at address pg.

Definition at line 994 of file ppl_c_implementation_common.cc.

10.14.2.11 int ppl_new_Generator_zero_dim_point (ppl_Generator_t * *pg*) [related]

Creates the point that is the origin of the zero-dimensional space $\mathbb{R}^0$. Writes a handle for the new generator at address `pg`.

Definition at line 987 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.15 ppl_Grid_Generator_System_const_iterator_tag Interface Reference

Types and functions for iterating on grid generator systems.

```
#include <ppl_c_header.h>
```

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_const_iterator_t *pgit)
  Builds a new 'const iterator' and writes a handle to it at address `pgit`.
- int ppl_new_Grid_Generator_System_const_iterator_from_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_const_iterator_t *pgit, ppl_const_Grid_Generator_System_const_iterator_t git)
  Builds a const iterator that is a copy of `git`; writes a handle for the newly created const iterator at address `pgit`.
- int ppl_assign_Grid_Generator_System_const_iterator_from_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_const_iterator_t dst, ppl_const_Grid_Generator_System_const_iterator_t src)
  Assigns a copy of the const iterator `src` to `dst`.
- int ppl_delete_Grid_Generator_System_const_iterator (ppl_const_Grid_Generator_System_const_iterator_t git)
  Invalidates the handle `git`: this makes sure the corresponding resources will eventually be released.

Dereferencing, Incrementing and Equality Testing

- int ppl_Grid_Generator_System_const_iterator_dereference (ppl_const_Grid_Generator_System_const_iterator_t git, ppl_const_Grid_Generator_t *pg)
  Dereference `git` writing a const handle to the resulting grid generator at address `pg`.
- int ppl_Grid_Generator_System_const_iterator_increment (ppl_Grid_Generator_System_const_iterator_t git)
  Increment `git` so that it "points" to the next grid generator.
- int ppl_Grid_Generator_System_const_iterator_equal_test (ppl_const_Grid_Generator_System_const_iterator_t x, ppl_const_Grid_Generator_System_const_iterator_t y)
  Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

10.15.1 Detailed Description

Types and functions for iterating on grid generator systems. The types and functions for grid generator systems iterators provide read-only access to the elements of a grid generator system by interfacing *Grid_-Generator_System::const_iterator*.

10.15.2 Friends And Related Function Documentation

10.15.2.1 int ppl_assign_Grid_Generator_System_const_iterator_from_Grid_Generator_-System_const_iterator (ppl_Grid_Generator_System_const_iterator_t *dst*, ppl_const_Grid_Generator_System_const_iterator_t *src*) [related]

Assigns a copy of the const iterator `src` to `dst`.

Definition at line 1802 of file ppl_c_implementation_common.cc.

10.15.2.2 int ppl_delete_Grid_Generator_System_const_iterator (ppl_const_Grid_Generator_-System_const_iterator_t *git*) [related]

Invalidates the handle `git`: this makes sure the corresponding resources will eventually be released.

Definition at line 1794 of file ppl_c_implementation_common.cc.

10.15.2.3 int ppl_Grid_Generator_System_const_iterator_dereference (ppl_const_Grid_-Generator_System_const_iterator_t *git*, ppl_const_Grid_Generator_t * *pg*) [related]

Dereference `git` writing a const handle to the resulting grid generator at address `pg`.

Definition at line 1835 of file ppl_c_implementation_common.cc.

10.15.2.4 int ppl_Grid_Generator_System_const_iterator_equal_test (ppl_const_Grid_Generator_System_const_iterator_t *x*, ppl_const_Grid_Generator_-System_const_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

Definition at line 1855 of file ppl_c_implementation_common.cc.

10.15.2.5 int ppl_Grid_Generator_System_const_iterator_increment (ppl_Grid_Generator_System_const_iterator_t *git*) [related]

Increment `git` so that it "points" to the next grid generator.

Definition at line 1846 of file ppl_c_implementation_common.cc.

10.15.2.6 int ppl_new_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_-const_iterator_t * *pgit*) [related]

Builds a new 'const iterator' and writes a handle to it at address `pgit`.

Definition at line 1776 of file ppl_c_implementation_common.cc.

10.15.2.7 int ppl_new_Grid_Generator_System_const_iterator_from_Grid_Generator_-System_const_iterator (ppl_Grid_Generator_System_const_iterator_t * *pgit*, ppl_const_Grid_Generator_System_const_iterator_t *git*) [related]

Builds a const iterator that is a copy of `git`; writes a handle for the newly created const iterator at address `pgit`.

Definition at line 1784 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.16 ppl_Grid_Generator_System_tag Interface Reference

Types and functions for grid generator systems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Grid_Generator_System (ppl_Grid_Generator_System_t *pgs)
  Builds an empty system of grid generators and writes a handle to it at address `pgs`.
- int ppl_new_Grid_Generator_System_from_Grid_Generator (ppl_Grid_Generator_System_t *pgs, ppl_const_Grid_Generator_t g)
  Builds the singleton grid generator system containing only a copy of generator `g`; writes a handle for the newly created system at address `pgs`.
- int ppl_new_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_-System_t *pgs, ppl_const_Grid_Generator_System_t gs)
  Builds a grid generator system that is a copy of `gs`; writes a handle for the newly created system at address `pgs`.
- int ppl_assign_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_-System_t dst, ppl_const_Grid_Generator_System_t src)
  Assigns a copy of the grid generator system `src` to `dst`.
- int ppl_delete_Grid_Generator_System (ppl_const_Grid_Generator_System_t gs)
  Invalidates the handle `gs`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the Grid Generator System

- int ppl_Grid_Generator_System_space_dimension (ppl_const_Grid_Generator_System_t gs, ppl_dimension_type *m)

  Writes to `m` *the dimension of the vector space enclosing* `gs`*.*

- int ppl_Grid_Generator_System_empty (ppl_const_Grid_Generator_System_t gs)

  Returns a positive integer if `gs` *contains no generator; returns 0 otherwise.*

- int ppl_Grid_Generator_System_begin (ppl_const_Grid_Generator_System_t gs, ppl_Grid_Generator_System_const_iterator_t git)

  Assigns to `git` *a const iterator "pointing" to the beginning of the grid generator system* `gs`*.*

- int ppl_Grid_Generator_System_end (ppl_const_Grid_Generator_System_t gs, ppl_Grid_Generator_System_const_iterator_t git)

  Assigns to `git` *a const iterator "pointing" past the end of the grid generator system* `gs`*.*

- int ppl_Grid_Generator_System_OK (ppl_const_Grid_Generator_System_t gs)

  Returns a positive integer if `gs` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `gs` *is broken. Useful for debugging purposes.*

Functions that May Modify the Grid Generator System

- int ppl_Grid_Generator_System_clear (ppl_Grid_Generator_System_t gs)

  Removes all the generators from the grid generator system `gs` *and sets its space dimension to 0.*

- int ppl_Grid_Generator_System_insert_Grid_Generator (ppl_Grid_Generator_System_t gs, ppl_const_Grid_Generator_t g)

  Inserts a copy of the grid generator `g` *into* `gs`*; the space dimension is increased, if necessary.*

10.16.1 Detailed Description

Types and functions for grid generator systems. The types and functions for grid generator systems provide an interface towards *Grid_Generator_System*.

10.16.2 Friends And Related Function Documentation

10.16.2.1 int ppl_assign_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_System_t *dst*, ppl_const_Grid_Generator_System_t *src*) [related]

Assigns a copy of the grid generator system `src` to `dst`.

Definition at line 1724 of file ppl_c_implementation_common.cc.

10.16.2.2 int ppl_delete_Grid_Generator_System (ppl_const_Grid_Generator_System_t *gs*) [related]

Invalidates the handle `gs`: this makes sure the corresponding resources will eventually be released.

Definition at line 1716 of file ppl_c_implementation_common.cc.

10.16.2.3 int ppl_Grid_Generator_System_begin (ppl_const_Grid_Generator_System_t *gs*, ppl_Grid_Generator_System_const_iterator_t *git*) [related]

Assigns to `git` a const iterator "pointing" to the beginning of the grid generator system `gs`.

Definition at line 1813 of file ppl_c_implementation_common.cc.

10.16.2.4 int ppl_Grid_Generator_System_clear (ppl_Grid_Generator_System_t *gs*) [related]

Removes all the generators from the grid generator system `gs` and sets its space dimension to 0.

Definition at line 1749 of file ppl_c_implementation_common.cc.

10.16.2.5 int ppl_Grid_Generator_System_empty (ppl_const_Grid_Generator_System_t *gs*) [related]

Returns a positive integer if `gs` contains no generator; returns 0 otherwise.

Definition at line 1742 of file ppl_c_implementation_common.cc.

10.16.2.6 int ppl_Grid_Generator_System_end (ppl_const_Grid_Generator_System_t *gs*, ppl_Grid_Generator_System_const_iterator_t *git*) [related]

Assigns to `git` a const iterator "pointing" past the end of the grid generator system `gs`.

Definition at line 1824 of file ppl_c_implementation_common.cc.

10.16.2.7 int ppl_Grid_Generator_System_insert_Grid_Generator (ppl_Grid_Generator_System_t *gs*, ppl_const_Grid_Generator_t *g*) [related]

Inserts a copy of the grid generator `g` into `gs`; the space dimension is increased, if necessary.

Definition at line 1757 of file ppl_c_implementation_common.cc.

10.16.2.8 int ppl_Grid_Generator_System_OK (ppl_const_Grid_Generator_System_t *gs*) [related]

Returns a positive integer if `gs` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `gs` is broken. Useful for debugging purposes.

Definition at line 1767 of file ppl_c_implementation_common.cc.

10.16.2.9 int ppl_Grid_Generator_System_space_dimension (ppl_const_Grid_Generator_System_t *gs*, ppl_dimension_type * *m*) [related]

Writes to `m` the dimension of the vector space enclosing `gs`.

Definition at line 1733 of file ppl_c_implementation_common.cc.

10.16.2.10 int ppl_new_Grid_Generator_System (ppl_Grid_Generator_System_t * *pgs*) [related]

Builds an empty system of grid generators and writes a handle to it at address `pgs`.

Definition at line 1682 of file ppl_c_implementation_common.cc.

10.16.2.11 int ppl_new_Grid_Generator_System_from_Grid_Generator (ppl_Grid_Generator_System_t * *pgs*, ppl_const_Grid_Generator_t *g*) [related]

Builds the singleton grid generator system containing only a copy of generator `g`; writes a handle for the newly created system at address `pgs`.

Definition at line 1699 of file ppl_c_implementation_common.cc.

10.16.2.12 int ppl_new_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_System_t * *pgs*, ppl_const_Grid_Generator_System_t *gs*) [related]

Builds a grid generator system that is a copy of `gs`; writes a handle for the newly created system at address `pgs`.

Definition at line 1708 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.17 ppl_Grid_Generator_tag Interface Reference

Types and functions for grid generators.

```
#include <ppl_c_header.h>
```

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Grid_Generator (ppl_Grid_Generator_t *pg, ppl_const_Linear_Expression_t le, enum ppl_enum_Grid_Generator_Type t, ppl_const_Coefficient_t d)

  Creates a new grid generator of direction `le` and type `t`. If the grid generator to be created is a point or a parameter, the divisor `d` is applied to `le`. If it is a line, `d` is simply disregarded. A handle for the new grid generator is written at address `pg`. The space dimension of the new grid generator is equal to the space dimension of `le`.

- int ppl_new_Grid_Generator_zero_dim_point (ppl_Grid_Generator_t *pg)

  Creates the point that is the origin of the zero-dimensional space $\mathbb{R}^0$. Writes a handle for the new grid generator at address `pg`.

- int ppl_new_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t *pg, ppl_const_Grid_Generator_t g)

  Builds a grid generator that is a copy of `g`; writes a handle for the newly created grid generator at address `pg`.

- int ppl_assign_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t dst, ppl_const_Grid_Generator_t src)

  Assigns a copy of the grid generator `src` to `dst`.

- int ppl_delete_Grid_Generator (ppl_const_Grid_Generator_t g)

  Invalidates the handle `g`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the Grid Generator

- int ppl_Grid_Generator_space_dimension (ppl_const_Grid_Generator_t g, ppl_dimension_type *m)

  Writes to `m` the space dimension of `g`.

- int ppl_Grid_Generator_type (ppl_const_Grid_Generator_t g)

  Returns the type of grid generator `g`.

- int ppl_Grid_Generator_coefficient (ppl_const_Grid_Generator_t g, ppl_dimension_type var, ppl_Coefficient_t n)

  Copies into `n` the coefficient of variable `var` in grid generator `g`.

- int ppl_Grid_Generator_divisor (ppl_const_Grid_Generator_t g, ppl_Coefficient_t n)

  If `g` is a point or a parameter assigns its divisor to `n`.

- int ppl_Grid_Generator_OK (ppl_const_Grid_Generator_t g)

  Returns a positive integer if `g` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `g` is broken. Useful for debugging purposes.

10.17.1 Detailed Description

Types and functions for grid generators. The types and functions for grid generators provide an interface towards *Grid_Generator*.

10.17.2 Friends And Related Function Documentation

10.17.2.1 int ppl_assign_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t *dst*, ppl_const_Grid_Generator_t *src*) [related]

Assigns a copy of the grid generator `src` to `dst`.

Definition at line 1609 of file ppl_c_implementation_common.cc.

10.17.2.2 int ppl_delete_Grid_Generator (ppl_const_Grid_Generator_t *g*) [related]

Invalidates the handle `g`: this makes sure the corresponding resources will eventually be released.

Definition at line 1601 of file ppl_c_implementation_common.cc.

10.17.2.3 int ppl_Grid_Generator_coefficient (ppl_const_Grid_Generator_t *g*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Copies into `n` the coefficient of variable `var` in grid generator `g`.

Definition at line 1642 of file ppl_c_implementation_common.cc.

10.17.2.4 int ppl_Grid_Generator_divisor (ppl_const_Grid_Generator_t *g*, ppl_Coefficient_t *n*) [related]

If `g` is a point or a parameter assigns its divisor to `n`.

Definition at line 1653 of file ppl_c_implementation_common.cc.

10.17.2.5 int ppl_Grid_Generator_OK (ppl_const_Grid_Generator_t *g*) [related]

Returns a positive integer if `g` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `g` is broken. Useful for debugging purposes.

Definition at line 1663 of file ppl_c_implementation_common.cc.

10.17.2.6 int ppl_Grid_Generator_space_dimension (ppl_const_Grid_Generator_t *g*, ppl_dimension_type * *m*) [related]

Writes to `m` the space dimension of `g`.

Definition at line 1619 of file ppl_c_implementation_common.cc.

10.17.2.7 int ppl_Grid_Generator_type (ppl_const_Grid_Generator_t *g*) [related]

Returns the type of grid generator `g`.

Definition at line 1627 of file ppl_c_implementation_common.cc.

10.17.2.8 int ppl_new_Grid_Generator (ppl_Grid_Generator_t * *pg*, ppl_const_Linear_Expression_t *le*, enum ppl_enum_Grid_Generator_Type *t*, ppl_const_Coefficient_t *d*) [related]

Creates a new grid generator of direction `le` and type `t`. If the grid generator to be created is a point or a parameter, the divisor `d` is applied to `le`. If it is a line, `d` is simply disregarded. A handle for the new grid generator is written at address `pg`. The space dimension of the new grid generator is equal to the space dimension of `le`.

Definition at line 1558 of file ppl_c_implementation_common.cc.

10.17.2.9 int ppl_new_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t * *pg*, ppl_const_Grid_Generator_t *g*) [related]

Builds a grid generator that is a copy of `g`; writes a handle for the newly created grid generator at address `pg`.

Definition at line 1592 of file ppl_c_implementation_common.cc.

10.17.2.10 int ppl_new_Grid_Generator_zero_dim_point (ppl_Grid_Generator_t * *pg*) [related]

Creates the point that is the origin of the zero-dimensional space $\mathbb{R}^0$. Writes a handle for the new grid generator at address `pg`.

Definition at line 1585 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.18 ppl_Linear_Expression_tag Interface Reference

Types and functions for linear expressions.

```
#include <ppl_c_header.h>
```

Related Functions

(Note that these are not member functions.)

Constructors, Assignment and Destructor

- int ppl_new_Linear_Expression (ppl_Linear_Expression_t *ple)
  Creates a new linear expression corresponding to the constant 0 in a zero-dimensional space; writes a handle for the new linear expression at address `ple`.

- int ppl_new_Linear_Expression_with_dimension (ppl_Linear_Expression_t *ple, ppl_dimension_type d)
  Creates a new linear expression corresponding to the constant 0 in a `d`*-dimensional space; writes a handle for the new linear expression at address* `ple`.

- int ppl_new_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t *ple, ppl_const_Linear_Expression_t le)
  Builds a linear expression that is a copy of `le`*; writes a handle for the newly created linear expression at address* `ple`.

- int ppl_new_Linear_Expression_from_Constraint (ppl_Linear_Expression_t *ple, ppl_const_Constraint_t c)
  Builds a linear expression corresponding to constraint `c`*; writes a handle for the newly created linear expression at address* `ple`.

- int ppl_new_Linear_Expression_from_Generator (ppl_Linear_Expression_t *ple, ppl_const_Generator_t g)
  Builds a linear expression corresponding to generator `g`*; writes a handle for the newly created linear expression at address* `ple`.

- int ppl_new_Linear_Expression_from_Congruence (ppl_Linear_Expression_t *ple, ppl_const_Congruence_t c)
  Builds a linear expression corresponding to congruence `c`*; writes a handle for the newly created linear expression at address* `ple`.

- int ppl_new_Linear_Expression_from_Grid_Generator (ppl_Linear_Expression_t *ple, ppl_const_Grid_Generator_t g)
  Builds a linear expression corresponding to grid generator `g`*; writes a handle for the newly created linear expression at address* `ple`.

- int ppl_assign_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t dst, ppl_const_Linear_Expression_t src)
  Assigns a copy of the linear expression `src` *to* `dst`.

- int ppl_delete_Linear_Expression (ppl_const_Linear_Expression_t le)
  Invalidates the handle `le`*: this makes sure the corresponding resources will eventually be released.*

Functions that Do Not Modify the Linear Expression

- int ppl_Linear_Expression_space_dimension (ppl_const_Linear_Expression_t le, ppl_dimension_type *m)
  Writes to `m` *the space dimension of* `le`.

- int ppl_Linear_Expression_coefficient (ppl_const_Linear_Expression_t le, ppl_dimension_type var, ppl_Coefficient_t n)

Copies into `n` *the coefficient of variable* `var` *in the linear expression* `le`.

- int ppl_Linear_Expression_inhomogeneous_term (ppl_const_Linear_Expression_t le, ppl_-Coefficient_t n)

  Copies into `n` *the inhomogeneous term of linear expression* `le`.

- int ppl_Linear_Expression_OK (ppl_const_Linear_Expression_t le)

  Returns a positive integer if `le` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `le` *is broken. Useful for debugging purposes.*

- int ppl_Linear_Expression_is_zero (ppl_const_Linear_Expression_t le)

  Returns `true` *if and only if* `*this` *is* 0.

- int ppl_Linear_Expression_all_homogeneous_terms_are_zero (ppl_const_Linear_Expression_-t le)

  Returns `true` *if and only if all the homogeneous terms of* `*this` *are* 0.

Functions that May Modify the Linear Expression

- int ppl_Linear_Expression_add_to_coefficient (ppl_Linear_Expression_t le, ppl_dimension_type var, ppl_const_Coefficient_t n)

  Adds `n` *to the coefficient of variable* `var` *in the linear expression* `le`. *The space dimension is set to be the maximum between* `var` + 1 *and the old space dimension.*

- int ppl_Linear_Expression_add_to_inhomogeneous (ppl_Linear_Expression_t le, ppl_const_-Coefficient_t n)

  Adds `n` *to the inhomogeneous term of the linear expression* `le`.

- int ppl_add_Linear_Expression_to_Linear_Expression (ppl_Linear_Expression_t dst, ppl_-const_Linear_Expression_t src)

  Adds the linear expression `src` *to* `dst`.

- int ppl_subtract_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t dst, ppl_const_Linear_Expression_t src)

  Subtracts the linear expression `src` *from* `dst`.

- int ppl_multiply_Linear_Expression_by_Coefficient (ppl_Linear_Expression_t le, ppl_const_-Coefficient_t n)

  Multiply the linear expression `dst` *by* `n`.

10.18.1 Detailed Description

Types and functions for linear expressions. The types and functions for linear expression provide an interface towards *Linear_Expression*.

10.18.2 Friends And Related Function Documentation

10.18.2.1 int ppl_add_Linear_Expression_to_Linear_Expression (ppl_Linear_Expression_t *dst*, ppl_const_Linear_Expression_t *src*) [related]

Adds the linear expression `src` to `dst`.

Definition at line 557 of file ppl_c_implementation_common.cc.

10.18.2.2 int ppl_assign_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t *dst*, ppl_const_Linear_Expression_t *src*) [related]

Assigns a copy of the linear expression `src` to `dst`.

Definition at line 526 of file ppl_c_implementation_common.cc.

10.18.2.3 int ppl_delete_Linear_Expression (ppl_const_Linear_Expression_t *le*) [related]

Invalidates the handle `le`: this makes sure the corresponding resources will eventually be released.

Definition at line 518 of file ppl_c_implementation_common.cc.

10.18.2.4 int ppl_Linear_Expression_add_to_coefficient (ppl_Linear_Expression_t *le*, ppl_dimension_type *var*, ppl_const_Coefficient_t *n*) [related]

Adds `n` to the coefficient of variable `var` in the linear expression `le`. The space dimension is set to be the maximum between `var` + 1 and the old space dimension.

Definition at line 535 of file ppl_c_implementation_common.cc.

10.18.2.5 int ppl_Linear_Expression_add_to_inhomogeneous (ppl_Linear_Expression_t *le*, ppl_const_Coefficient_t *n*) [related]

Adds `n` to the inhomogeneous term of the linear expression `le`.

Definition at line 546 of file ppl_c_implementation_common.cc.

10.18.2.6 int ppl_Linear_Expression_all_homogeneous_terms_are_zero (ppl_const_Linear_Expression_t *le*) [related]

Returns `true` if and only if all the homogeneous terms of `*this` are 0.

Definition at line 628 of file ppl_c_implementation_common.cc.

10.18.2.7 int ppl_Linear_Expression_coefficient (ppl_const_Linear_Expression_t *le*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Copies into `n` the coefficient of variable `var` in the linear expression `le`.

Definition at line 594 of file ppl_c_implementation_common.cc.

10.18.2.8 int ppl_Linear_Expression_inhomogeneous_term (ppl_const_Linear_Expression_t *le*, ppl_Coefficient_t *n*) [related]

Copies into `n` the inhomogeneous term of linear expression `le`.

Definition at line 605 of file ppl_c_implementation_common.cc.

10.18.2.9 int ppl_Linear_Expression_is_zero (ppl_const_Linear_Expression_t *le*) [related]

Returns `true` if and only if `*this` is 0.

Definition at line 621 of file ppl_c_implementation_common.cc.

10.18.2.10 int ppl_Linear_Expression_OK (ppl_const_Linear_Expression_t *le*) [related]

Returns a positive integer if `le` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `le` is broken. Useful for debugging purposes.

Definition at line 615 of file ppl_c_implementation_common.cc.

10.18.2.11 int ppl_Linear_Expression_space_dimension (ppl_const_Linear_Expression_t *le*, ppl_dimension_type * *m*) [related]

Writes to `m` the space dimension of `le`.

Definition at line 586 of file ppl_c_implementation_common.cc.

10.18.2.12 int ppl_multiply_Linear_Expression_by_Coefficient (ppl_Linear_Expression_t *le*, ppl_const_Coefficient_t *n*) [related]

Multiply the linear expression `dst` by `n`.

Definition at line 576 of file ppl_c_implementation_common.cc.

10.18.2.13 int ppl_new_Linear_Expression (ppl_Linear_Expression_t * *ple*) [related]

Creates a new linear expression corresponding to the constant 0 in a zero-dimensional space; writes a handle for the new linear expression at address `ple`.

Definition at line 492 of file ppl_c_implementation_common.cc.

10.18.2.14 int ppl_new_Linear_Expression_from_Congruence (ppl_Linear_Expression_t * *ple*, ppl_const_Congruence_t *c*) [related]

Builds a linear expression corresponding to congruence `c`; writes a handle for the newly created linear expression at address `ple`.

Definition at line 1366 of file ppl_c_implementation_common.cc.

10.18.2.15 int ppl_new_Linear_Expression_from_Constraint (ppl_Linear_Expression_t * *ple*, ppl_const_Constraint_t *c*) [related]

Builds a linear expression corresponding to constraint `c`; writes a handle for the newly created linear expression at address `ple`.

Definition at line 757 of file ppl_c_implementation_common.cc.

10.18.2.16 int ppl_new_Linear_Expression_from_Generator (ppl_Linear_Expression_t * *ple*, ppl_const_Generator_t *g*) [related]

Builds a linear expression corresponding to generator `g`; writes a handle for the newly created linear expression at address `ple`.

Definition at line 1079 of file ppl_c_implementation_common.cc.

10.18.2.17 int ppl_new_Linear_Expression_from_Grid_Generator (ppl_Linear_Expression_t * *ple*, ppl_const_Grid_Generator_t *g*) [related]

Builds a linear expression corresponding to grid generator `g`; writes a handle for the newly created linear expression at address `ple`.

10.18.2.18 int ppl_new_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t * *ple*, ppl_const_Linear_Expression_t *le*) [related]

Builds a linear expression that is a copy of `le`; writes a handle for the newly created linear expression at address `ple`.

Definition at line 510 of file ppl_c_implementation_common.cc.

10.18.2.19 int ppl_new_Linear_Expression_with_dimension (ppl_Linear_Expression_t * *ple*, ppl_dimension_type *d*) [related]

Creates a new linear expression corresponding to the constant 0 in a `d`-dimensional space; writes a handle for the new linear expression at address `ple`.

Definition at line 499 of file ppl_c_implementation_common.cc.

10.18.2.20 int ppl_subtract_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t *dst*, ppl_const_Linear_Expression_t *src*) [related]

Subtracts the linear expression `src` from `dst`.

Definition at line 567 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.19 ppl_MIP_Problem_tag Interface Reference

Types and functions for MIP problems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Symbolic Constants

- int PPL_OPTIMIZATION_MODE_MAXIMIZATION
  Code of the "maximization" optimization mode.
- int PPL_OPTIMIZATION_MODE_MINIMIZATION
  Code of the "minimization" optimization mode.
- int PPL_MIP_PROBLEM_STATUS_UNFEASIBLE
  Code of the "unfeasible MIP problem" status.
- int PPL_MIP_PROBLEM_STATUS_UNBOUNDED
  Code of the "unbounded MIP problem" status.
- int PPL_MIP_PROBLEM_STATUS_OPTIMIZED
  Code of the "optimized MIP problem" status.
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_NAME_PRICING
  Code for the MIP problem's "pricing" control parameter name.
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_TEXTBOOK
  Code of MIP problem's "textbook" pricing method.
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_EXACT
  Code of MIP problem's "exact steepest-edge" pricing method.
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_FLOAT

Code of MIP problem's "float steepest-edge" pricing method.

Constructors, Assignment and Destructor

- int ppl_new_MIP_Problem_from_space_dimension (ppl_MIP_Problem_t *pmip, ppl_dimension_type d)

  Builds a trivial MIP problem of dimension `d` and writes a handle to it at address `pmip`.

- int ppl_new_MIP_Problem (ppl_MIP_Problem_t *pmip, ppl_dimension_type d, ppl_const_Constraint_System_t cs, ppl_const_Linear_Expression_t le, int m)

  Builds a MIP problem of space dimension `d` having feasible region `cs`, objective function `le` and optimization mode `m`; writes a handle to it at address `pmip`.

- int ppl_new_MIP_Problem_from_MIP_Problem (ppl_MIP_Problem_t *pmip, ppl_const_MIP_Problem_t mip)

  Builds a MIP problem that is a copy of `mip`; writes a handle for the newly created system at address `pmip`.

- int ppl_assign_MIP_Problem_from_MIP_Problem (ppl_MIP_Problem_t dst, ppl_const_MIP_Problem_t src)

  Assigns a copy of the MIP problem `src` to `dst`.

- int ppl_delete_MIP_Problem (ppl_const_MIP_Problem_t mip)

  Invalidates the handle `mip`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the MIP_Problem

- int ppl_MIP_Problem_space_dimension (ppl_const_MIP_Problem_t mip, ppl_dimension_type *m)

  Writes to `m` the dimension of the vector space enclosing `mip`.

- int ppl_MIP_Problem_number_of_integer_space_dimensions (ppl_const_MIP_Problem_t mip, ppl_dimension_type *m)

  Writes to `m` the number of integer space dimensions of `mip`.

- int ppl_MIP_Problem_integer_space_dimensions (ppl_const_MIP_Problem_t mip, ppl_dimension_type ds[ ])

  Writes in the first positions of the array `ds` all the integer space dimensions of problem `mip`. If the array is not big enough to hold all of the integer space dimensions, the behavior is undefined.

- int ppl_MIP_Problem_number_of_constraints (ppl_const_MIP_Problem_t mip, ppl_dimension_type *m)

  Writes to `m` the number of constraints defining the feasible region of `mip`.

- int ppl_MIP_Problem_constraint_at_index (ppl_const_MIP_Problem_t mip, ppl_dimension_type i, ppl_const_Constraint_t *pc)

  Writes at address `pc` a const handle to the `i-th` constraint defining the feasible region of the MIP problem `mip`.

- int ppl_MIP_Problem_objective_function (ppl_const_MIP_Problem_t mip, ppl_const_Linear_Expression_t *ple)

  Writes a const handle to the linear expression defining the objective function of the MIP problem `mip` at address `ple`.

- int ppl_MIP_Problem_optimization_mode (ppl_const_MIP_Problem_t mip)
  Returns the optimization mode of the MIP problem `mip`.

- int ppl_MIP_Problem_OK (ppl_const_MIP_Problem_t mip)
  Returns a positive integer if `mip` *is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if* `mip` *is broken. Useful for debugging purposes.*

Functions that May Modify the MIP_Problem

- int ppl_MIP_Problem_clear (ppl_MIP_Problem_t mip)
  Resets the MIP problem to be a trivial problem of space dimension 0.

- int ppl_MIP_Problem_add_space_dimensions_and_embed (ppl_MIP_Problem_t mip, ppl_dimension_type d)
  Adds `d` *new dimensions to the space enclosing the MIP problem* `mip` *and to* `mip` *itself.*

- int ppl_MIP_Problem_add_to_integer_space_dimensions (ppl_MIP_Problem_t mip, ppl_dimension_type ds[ ], size_t n)
  Sets the space dimensions that are specified in first `n` *positions of the array* `ds` *to be integer dimensions of problem* `mip`*. The presence of duplicates in* `ds` *is a waste but an innocuous one.*

- int ppl_MIP_Problem_add_constraint (ppl_MIP_Problem_t mip, ppl_const_Constraint_t c)
  Modifies the feasible region of the MIP problem `mip` *by adding a copy of the constraint* `c`.

- int ppl_MIP_Problem_add_constraints (ppl_MIP_Problem_t mip, ppl_const_Constraint_System_t cs)
  Modifies the feasible region of the MIP problem `mip` *by adding a copy of the constraints in* `cs`.

- int ppl_MIP_Problem_set_objective_function (ppl_MIP_Problem_t mip, ppl_const_Linear_Expression_t le)
  Sets the objective function of the MIP problem `mip` *to a copy of* `le`.

- int ppl_MIP_Problem_set_optimization_mode (ppl_MIP_Problem_t mip, int mode)
  Sets the optimization mode of the MIP problem `mip` *to* `mode`.

Computing the Solution of the MIP_Problem

- int ppl_MIP_Problem_is_satisfiable (ppl_const_MIP_Problem_t mip)
  Returns a positive integer if `mip` *is satisfiable; returns 0 otherwise.*

- int ppl_MIP_Problem_solve (ppl_const_MIP_Problem_t mip)
  Solves the MIP problem `mip`*, returning an exit status.*

- int ppl_MIP_Problem_evaluate_objective_function (ppl_const_MIP_Problem_t mip, ppl_const_Generator_t g, ppl_Coefficient_t num, ppl_Coefficient_t den)
  Evaluates the objective function of `mip` *on point* `g`.

- int ppl_MIP_Problem_feasible_point (ppl_const_MIP_Problem_t mip, ppl_const_Generator_t *pg)
  Writes a const handle to a feasible point for the MIP problem `mip` *at address* `pg`.

- int ppl_MIP_Problem_optimizing_point (ppl_const_MIP_Problem_t mip, ppl_const_Generator_t *pg)
  Writes a const handle to an optimizing point for the MIP problem `mip` at address `pg`.
- int ppl_MIP_Problem_optimal_value (ppl_const_MIP_Problem_t mip, ppl_Coefficient_t num, ppl_Coefficient_t den)
  Returns the optimal value for `mip`.

Querying/Setting Control Parameters

- int ppl_MIP_Problem_get_control_parameter (ppl_const_MIP_Problem_t mip, int name)
  Returns the value of control parameter `name` in problem `mip`.
- int ppl_MIP_Problem_set_control_parameter (ppl_MIP_Problem_t mip, int value)
  Sets control parameter `value` in problem `mip`.
- int ppl_MIP_Problem_total_memory_in_bytes (ppl_const_MIP_Problem_t mip, size_t *sz)
  Writes into `*sz` the size in bytes of the memory occupied by `mip`.
- int ppl_MIP_Problem_external_memory_in_bytes (ppl_const_MIP_Problem_t mip, size_t *sz)
  Writes into `*sz` the size in bytes of the memory managed by `mip`.

10.19.1 Detailed Description

Types and functions for MIP problems. The types and functions for MIP problems provide an interface towards *MIP_Problem*.

10.19.2 Friends And Related Function Documentation

10.19.2.1 int ppl_assign_MIP_Problem_from_MIP_Problem (ppl_MIP_Problem_t *dst*, ppl_const_MIP_Problem_t *src*) [related]

Assigns a copy of the MIP problem `src` to `dst`.

Definition at line 1902 of file ppl_c_implementation_common.cc.

10.19.2.2 int ppl_delete_MIP_Problem (ppl_const_MIP_Problem_t *mip*) [related]

Invalidates the handle `mip`: this makes sure the corresponding resources will eventually be released.

Definition at line 1895 of file ppl_c_implementation_common.cc.

10.19.2.3 int ppl_MIP_Problem_add_constraint (ppl_MIP_Problem_t *mip*, ppl_const_Constraint_t *c*) [related]

Modifies the feasible region of the MIP problem `mip` by adding a copy of the constraint `c`.

Definition at line 2010 of file ppl_c_implementation_common.cc.

10.19.2.4 int ppl_MIP_Problem_add_constraints (ppl_MIP_Problem_t *mip*, ppl_const_Constraint_System_t *cs*) [related]

Modifies the feasible region of the MIP problem `mip` by adding a copy of the constraints in `cs`.

Definition at line 2020 of file ppl_c_implementation_common.cc.

10.19.2.5 int ppl_MIP_Problem_add_space_dimensions_and_embed (ppl_MIP_Problem_t *mip*, ppl_dimension_type *d*) [related]

Adds `d` new dimensions to the space enclosing the MIP problem `mip` and to `mip` itself.

Definition at line 1988 of file ppl_c_implementation_common.cc.

10.19.2.6 int ppl_MIP_Problem_add_to_integer_space_dimensions (ppl_MIP_Problem_t *mip*, ppl_dimension_type *ds*[ ], size_t *n*) [related]

Sets the space dimensions that are specified in first `n` positions of the array `ds` to be integer dimensions of problem `mip`. The presence of duplicates in `ds` is a waste but an innocuous one.

Definition at line 1997 of file ppl_c_implementation_common.cc.

10.19.2.7 int ppl_MIP_Problem_clear (ppl_MIP_Problem_t *mip*) [related]

Resets the MIP problem to be a trivial problem of space dimension 0.

Definition at line 1981 of file ppl_c_implementation_common.cc.

10.19.2.8 int ppl_MIP_Problem_constraint_at_index (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type *i*, ppl_const_Constraint_t * *pc*) [related]

Writes at address `pc` a const handle to the `i-th` constraint defining the feasible region of the MIP problem `mip`.

Definition at line 1950 of file ppl_c_implementation_common.cc.

10.19.2.9 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_NAME_PRICING [related]

Code for the MIP problem's "pricing" control parameter name.

Definition at line 2428 of file ppl_c_header.h.

10.19.2.10 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_EXACT [related]

Code of MIP problem's "exact steepest-edge" pricing method.

Definition at line 2438 of file ppl_c_header.h.

10.19.2.11 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_FLOAT [related]

Code of MIP problem's "float steepest-edge" pricing method.

Definition at line 2443 of file ppl_c_header.h.

10.19.2.12 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_TEXTBOOK [related]

Code of MIP problem's "textbook" pricing method.

Definition at line 2433 of file ppl_c_header.h.

10.19.2.13 int ppl_MIP_Problem_evaluate_objective_function (ppl_const_MIP_Problem_t *mip*, ppl_const_Generator_t *g*, ppl_Coefficient_t *num*, ppl_Coefficient_t *den*) [related]

Evaluates the objective function of `mip` on point `g`.

Parameters

mip The MIP problem defining the objective function;

g The generator on which the objective function will be evaluated;

num Will be assigned the numerator of the objective function value;

den Will be assigned the denominator of the objective function value;

Definition at line 2062 of file ppl_c_implementation_common.cc.

10.19.2.14 int ppl_MIP_Problem_external_memory_in_bytes (ppl_const_MIP_Problem_t *mip*, size_t * *sz*) [related]

Writes into `*sz` the size in bytes of the memory managed by `mip`.

Definition at line 2138 of file ppl_c_implementation_common.cc.

10.19.2.15 int ppl_MIP_Problem_feasible_point (ppl_const_MIP_Problem_t *mip*, ppl_const_Generator_t * *pg*) [related]

Writes a const handle to a feasible point for the MIP problem `mip` at address `pg`.

Definition at line 2076 of file ppl_c_implementation_common.cc.

10.19.2.16 int ppl_MIP_Problem_get_control_parameter (ppl_const_MIP_Problem_t *mip*, int *name*) [related]

Returns the value of control parameter `name` in problem `mip`.

Definition at line 2105 of file ppl_c_implementation_common.cc.

10.19.2.17 int ppl_MIP_Problem_integer_space_dimensions (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type *ds*[ ]) [related]

Writes in the first positions of the array `ds` all the integer space dimensions of problem `mip`. If the array is not big enough to hold all of the integer space dimensions, the behavior is undefined.

Definition at line 1929 of file ppl_c_implementation_common.cc.

10.19.2.18 int ppl_MIP_Problem_is_satisfiable (ppl_const_MIP_Problem_t *mip*) [related]

Returns a positive integer if `mip` is satisfiable; returns 0 otherwise.

Definition at line 2050 of file ppl_c_implementation_common.cc.

10.19.2.19 int ppl_MIP_Problem_number_of_constraints (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type * *m*) [related]

Writes to `m` the number of constraints defining the feasible region of `mip`.

Definition at line 1941 of file ppl_c_implementation_common.cc.

Referenced by ppl_MIP_Problem_constraint_at_index().

10.19.2.20 int ppl_MIP_Problem_number_of_integer_space_dimensions (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type * *m*) [related]

Writes to `m` the number of integer space dimensions of `mip`.

Definition at line 1920 of file ppl_c_implementation_common.cc.

10.19.2.21 int ppl_MIP_Problem_objective_function (ppl_const_MIP_Problem_t *mip*, ppl_const_Linear_Expression_t * *ple*) [related]

Writes a const handle to the linear expression defining the objective function of the MIP problem `mip` at address `ple`.

Definition at line 1966 of file ppl_c_implementation_common.cc.

10.19.2.22 int ppl_MIP_Problem_OK (ppl_const_MIP_Problem_t *mip*) [related]

Returns a positive integer if `mip` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `mip` is broken. Useful for debugging purposes.

Definition at line 2124 of file ppl_c_implementation_common.cc.

10.19.2.23 int ppl_MIP_Problem_optimal_value (ppl_const_MIP_Problem_t *mip*, ppl_Coefficient_t *num*, ppl_Coefficient_t *den*) [related]

Returns the optimal value for `mip`.

Parameters

mip The MIP problem;

num Will be assigned the numerator of the optimal value;

den Will be assigned the denominator of the optimal value.

Definition at line 2094 of file ppl_c_implementation_common.cc.

10.19.2.24 int ppl_MIP_Problem_optimization_mode (ppl_const_MIP_Problem_t *mip*) [related]

Returns the optimization mode of the MIP problem `mip`.

Definition at line 1975 of file ppl_c_implementation_common.cc.

10.19.2.25 int ppl_MIP_Problem_optimizing_point (ppl_const_MIP_Problem_t *mip*, ppl_const_Generator_t * *pg*) [related]

Writes a const handle to an optimizing point for the MIP problem `mip` at address `pg`.

Definition at line 2085 of file ppl_c_implementation_common.cc.

10.19.2.26 int ppl_MIP_Problem_set_control_parameter (ppl_MIP_Problem_t *mip*, int *value*) [related]

Sets control parameter `value` in problem `mip`.

Definition at line 2114 of file ppl_c_implementation_common.cc.

10.19.2.27 int ppl_MIP_Problem_set_objective_function (ppl_MIP_Problem_t *mip*, ppl_const_Linear_Expression_t *le*) [related]

Sets the objective function of the MIP problem `mip` to a copy of `le`.

Definition at line 2030 of file ppl_c_implementation_common.cc.

10.19.2.28 int ppl_MIP_Problem_set_optimization_mode (ppl_MIP_Problem_t *mip*, int *mode*) [related]

Sets the optimization mode of the MIP problem `mip` to `mode`.

Definition at line 2040 of file ppl_c_implementation_common.cc.

10.19.2.29 int ppl_MIP_Problem_solve (ppl_const_MIP_Problem_t *mip*) [related]

Solves the MIP problem `mip`, returning an exit status.

Returns

`PPL_MIP_PROBLEM_STATUS_UNFEASIBLE` if the MIP problem is not satisfiable; `PPL_MIP_PROBLEM_STATUS_UNBOUNDED` if the MIP problem is satisfiable but there is no finite bound to the value of the objective function; `PPL_MIP_PROBLEM_STATUS_OPTIMIZED` if the MIP problem admits an optimal solution.

Definition at line 2056 of file ppl_c_implementation_common.cc.

10.19.2.30 int ppl_MIP_Problem_space_dimension (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type * *m*) [related]

Writes to `m` the dimension of the vector space enclosing `mip`.

Definition at line 1912 of file ppl_c_implementation_common.cc.

10.19.2.31 int PPL_MIP_PROBLEM_STATUS_OPTIMIZED [related]

Code of the "optimized MIP problem" status.

Definition at line 2423 of file ppl_c_header.h.

10.19.2.32 int PPL_MIP_PROBLEM_STATUS_UNBOUNDED [related]

Code of the "unbounded MIP problem" status.

Definition at line 2418 of file ppl_c_header.h.

10.19.2.33 int PPL_MIP_PROBLEM_STATUS_UNFEASIBLE [related]

Code of the "unfeasible MIP problem" status.

Definition at line 2413 of file ppl_c_header.h.

10.19.2.34 int ppl_MIP_Problem_total_memory_in_bytes (ppl_const_MIP_Problem_t *mip*, size_t * *sz*) [related]

Writes into `*sz` the size in bytes of the memory occupied by `mip`.

Definition at line 2130 of file ppl_c_implementation_common.cc.

10.19.2.35 int ppl_new_MIP_Problem (ppl_MIP_Problem_t * *pmip*, ppl_dimension_type *d*, ppl_const_Constraint_System_t *cs*, ppl_const_Linear_Expression_t *le*, int *m*) [related]

Builds a MIP problem of space dimension `d` having feasible region `cs`, objective function `le` and optimization mode `m`; writes a handle to it at address `pmip`.

Definition at line 1872 of file ppl_c_implementation_common.cc.

10.19.2.36 int ppl_new_MIP_Problem_from_MIP_Problem (ppl_MIP_Problem_t * *pmip*, ppl_const_MIP_Problem_t *mip*) [related]

Builds a MIP problem that is a copy of `mip`; writes a handle for the newly created system at address `pmip`.

Definition at line 1886 of file ppl_c_implementation_common.cc.

10.19.2.37 int ppl_new_MIP_Problem_from_space_dimension (ppl_MIP_Problem_t * *pmip*, ppl_dimension_type *d*) [related]

Builds a trivial MIP problem of dimension `d` and writes a handle to it at address `pmip`.

Definition at line 1864 of file ppl_c_implementation_common.cc.

10.19.2.38 int PPL_OPTIMIZATION_MODE_MAXIMIZATION [related]

Code of the "maximization" optimization mode.

Definition at line 2403 of file ppl_c_header.h.

10.19.2.39 int PPL_OPTIMIZATION_MODE_MINIMIZATION [related]

Code of the "minimization" optimization mode.

Definition at line 2408 of file ppl_c_header.h.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.20 ppl_PIP_Decision_Node_tag Interface Reference

Types and functions for PIP decision nodes.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

- int ppl_PIP_Decision_Node_get_child_node (ppl_const_PIP_Decision_Node_t pip_dec, int b, ppl_const_PIP_Tree_Node_t *pip_tree)

  Writes to `pip_tree` a const pointer to either the true branch (if `b` is not zero) or the false branch (if `b` is zero) of `pip_dec`.

10.20.1 Detailed Description

Types and functions for PIP decision nodes. The types and functions for decision nodes provide an interface towards *PIP_Decision_Node*.

10.20.2 Friends And Related Function Documentation

10.20.2.1 int ppl_PIP_Decision_Node_get_child_node (ppl_const_PIP_Decision_Node_t *pip_dec*, int *b*, ppl_const_PIP_Tree_Node_t * *pip_tree*) [related]

Writes to `pip_tree` a const pointer to either the true branch (if `b` is not zero) or the false branch (if `b` is zero) of `pip_dec`.

Definition at line 2468 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.21 ppl_PIP_Problem_tag Interface Reference

Types and functions for PIP problems.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

Symbolic Constants

- int PPL_PIP_PROBLEM_STATUS_UNFEASIBLE
  Code of the "unfeasible PIP problem" status.
- int PPL_PIP_PROBLEM_STATUS_OPTIMIZED
  Code of the "optimized PIP problem" status.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_CUTTING_STRATEGY
  Code for the PIP problem's "cutting strategy" control parameter name.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_PIVOT_ROW_STRATEGY
  Code for the PIP problem's "pivot row strategy" control parameter name.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_FIRST
  Code of PIP problem's "first" cutting strategy.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_DEEPEST
  Code of PIP problem's "deepest" cutting strategy.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_ALL
  Code of PIP problem's "all" cutting strategy.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_FIRST
  Code of PIP problem's "first" pivot row strategy.
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_MAX_COLUMN
  Code of PIP problem's "max column" pivot row strategy.

Constructors, Assignment and Destructor

- int ppl_new_PIP_Problem_from_space_dimension (ppl_PIP_Problem_t *ppip, ppl_dimension_type d)
  Builds a trivial PIP problem of dimension `d` and writes a handle to it at address `ppip`.
- int ppl_new_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t *ppip, ppl_const_PIP_Problem_t pip)
  Builds a PIP problem that is a copy of `pip`; writes a handle for the newly created problem at address `ppip`.

- int ppl_assign_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t dst, ppl_const_PIP_Problem_t src)

  Assigns a copy of the PIP problem `src` to `dst`.

- int ppl_new_PIP_Problem_from_constraints (ppl_PIP_Problem_t *ppip, ppl_dimension_type d, ppl_Constraint_System_const_iterator_t first, ppl_Constraint_System_const_iterator_t last, size_t n, ppl_dimension_type ds[ ])

  Builds a PIP problem having space dimension `d` from the sequence of constraints in the range [first, last)*; the `n` dimensions whose indices occur in `ds` are interpreted as parameters.*

- int ppl_delete_PIP_Problem (ppl_const_PIP_Problem_t pip)

  Invalidates the handle `pip`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the PIP_Problem

- int ppl_PIP_Problem_space_dimension (ppl_const_PIP_Problem_t pip, ppl_dimension_type *m)

  Writes to `m` the dimension of the vector space enclosing `pip`.

- int ppl_PIP_Problem_number_of_parameter_space_dimensions (ppl_const_PIP_Problem_t pip, ppl_dimension_type *m)

  Writes to `m` the number of parameter space dimensions of `pip`.

- int ppl_PIP_Problem_parameter_space_dimensions (ppl_const_PIP_Problem_t pip, ppl_dimension_type ds[ ])

  Writes in the first positions of the array `ds` all the parameter space dimensions of problem `pip`. If the array is not big enough to hold all of the parameter space dimensions, the behavior is undefined.

- int ppl_PIP_Problem_get_big_parameter_dimension (ppl_const_PIP_Problem_t pip, ppl_dimension_type *pd)

  Writes into `*pd` the big parameter dimension of PIP problem `pip`.

- int ppl_PIP_Problem_number_of_constraints (ppl_const_PIP_Problem_t pip, ppl_dimension_type *m)

  Writes to `m` the number of constraints defining the feasible region of `pip`.

- int ppl_PIP_Problem_constraint_at_index (ppl_const_PIP_Problem_t pip, ppl_dimension_type i, ppl_const_Constraint_t *pc)

  Writes at address `pc` a const handle to the `i-th` constraint defining the feasible region of the PIP problem `pip`.

- int ppl_PIP_Problem_total_memory_in_bytes (ppl_const_PIP_Problem_t pip, size_t *sz)

  Writes into `*sz` the size in bytes of the memory occupied by `pip`.

- int ppl_PIP_Problem_external_memory_in_bytes (ppl_const_PIP_Problem_t pip, size_t *sz)

  Writes into `*sz` the size in bytes of the memory managed by `pip`.

- int ppl_PIP_Problem_OK (ppl_const_PIP_Problem_t pip)

  Returns a positive integer if `pip` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `pip` is broken. Useful for debugging purposes.

Functions that May Modify the PIP_Problem

- int ppl_PIP_Problem_clear (ppl_PIP_Problem_t pip)
  Resets the PIP problem to be a trivial problem of space dimension 0.

- int ppl_PIP_Problem_add_space_dimensions_and_embed (ppl_PIP_Problem_t pip, ppl_dimension_type pip_vars, ppl_dimension_type pip_params)
  Adds `pip_vars + pip_params` new space dimensions and embeds the PIP problem `pip` in the new vector space.

- int ppl_PIP_Problem_add_to_parameter_space_dimensions (ppl_PIP_Problem_t pip, ppl_dimension_type ds[ ], size_t n)
  Sets the space dimensions that are specified in first `n` positions of the array `ds` to be parameter dimensions of problem `pip`. The presence of duplicates in `ds` is a waste but an innocuous one.

- int ppl_PIP_Problem_set_big_parameter_dimension (ppl_PIP_Problem_t pip, ppl_dimension_type d)
  Sets the big parameter dimension of PIP problem `pip` to `d`.

- int ppl_PIP_Problem_add_constraint (ppl_PIP_Problem_t pip, ppl_const_Constraint_t c)
  Modifies the feasible region of the PIP problem `pip` by adding a copy of the constraint `c`.

- int ppl_PIP_Problem_add_constraints (ppl_PIP_Problem_t pip, ppl_const_Constraint_System_t cs)
  Modifies the feasible region of the PIP problem `pip` by adding a copy of the constraints in `cs`.

Computing and Printing the Solution of the PIP_Problem

- int ppl_PIP_Problem_is_satisfiable (ppl_const_PIP_Problem_t pip)
  Returns a positive integer if `pip` is satisfiable and an optimal solution can be found; returns 0 otherwise.

- int ppl_PIP_Problem_solve (ppl_const_PIP_Problem_t pip)
  Solves the PIP problem `pip`, returning an exit status.

- int ppl_PIP_Problem_solution (ppl_const_PIP_Problem_t pip, ppl_const_PIP_Tree_Node_t *pip_tree)
  Writes to `pip_tree` a solution for `pip`, if it exists.

- int ppl_PIP_Problem_optimizing_solution (ppl_const_PIP_Problem_t pip, ppl_const_PIP_Tree_Node_t *pip_tree)
  Writes to `pip_tree` an optimizing solution for `pip`, if it exists.

Querying/Setting Control Parameters

- int ppl_PIP_Problem_get_control_parameter (ppl_const_PIP_Problem_t pip, int name)
  Returns the value of control parameter `name` in problem `pip`.

- int ppl_PIP_Problem_set_control_parameter (ppl_PIP_Problem_t pip, int value)
  Sets control parameter `value` in problem `pip`.

10.21.1 Detailed Description

Types and functions for PIP problems. The types and functions for PIP problems provide an interface towards *PIP_Problem*.

10.21.2 Friends And Related Function Documentation

10.21.2.1 int ppl_assign_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t *dst*, ppl_const_PIP_Problem_t *src*) [related]

Assigns a copy of the PIP problem `src` to `dst`.

Definition at line 2180 of file ppl_c_implementation_common.cc.

10.21.2.2 int ppl_delete_PIP_Problem (ppl_const_PIP_Problem_t *pip*) [related]

Invalidates the handle `pip`: this makes sure the corresponding resources will eventually be released.

Definition at line 2190 of file ppl_c_implementation_common.cc.

10.21.2.3 int ppl_new_PIP_Problem_from_constraints (ppl_PIP_Problem_t * *ppip*, ppl_dimension_type *d*, ppl_Constraint_System_const_iterator_t *first*, ppl_Constraint_System_const_iterator_t *last*, size_t *n*, ppl_dimension_type *ds*[ ]) [related]

Builds a PIP problem having space dimension `d` from the sequence of constraints in the range $[\mathrm{first}, \mathrm{last})$; the `n` dimensions whose indices occur in `ds` are interpreted as parameters.

Definition at line 2164 of file ppl_c_implementation_common.cc.

10.21.2.4 int ppl_new_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t * *ppip*, ppl_const_PIP_Problem_t *pip*) [related]

Builds a PIP problem that is a copy of `pip`; writes a handle for the newly created problem at address `ppip`.

Definition at line 2154 of file ppl_c_implementation_common.cc.

10.21.2.5 int ppl_new_PIP_Problem_from_space_dimension (ppl_PIP_Problem_t * *ppip*, ppl_dimension_type *d*) [related]

Builds a trivial PIP problem of dimension `d` and writes a handle to it at address `ppip`.

Definition at line 2146 of file ppl_c_implementation_common.cc.

10.21.2.6 int ppl_PIP_Problem_add_constraint (ppl_PIP_Problem_t *pip*, ppl_const_Constraint_t *c*) [related]

Modifies the feasible region of the PIP problem `pip` by adding a copy of the constraint `c`.

Definition at line 2278 of file ppl_c_implementation_common.cc.

10.21.2.7 int ppl_PIP_Problem_add_constraints (ppl_PIP_Problem_t *pip*, ppl_const_Constraint_System_t *cs*) [related]

Modifies the feasible region of the PIP problem `pip` by adding a copy of the constraints in `cs`.

Definition at line 2288 of file ppl_c_implementation_common.cc.

10.21.2.8 int ppl_PIP_Problem_add_space_dimensions_and_embed (ppl_PIP_Problem_t *pip*, ppl_dimension_type *pip_vars*, ppl_dimension_type *pip_params*) [related]

Adds `pip_vars + pip_params` new space dimensions and embeds the PIP problem `pip` in the new vector space.

Parameters

pip The PIP problem to be embedded in the new vector space.

pip_vars The number of space dimensions to add that are interpreted as PIP problem variables (i.e., non parameters). These are added *before* adding the `pip_params` parameters.

pip_params The number of space dimensions to add that are interpreted as PIP problem parameters. These are added *after* having added the `pip_vars` problem variables.

The new space dimensions will be those having the highest indexes in the new PIP problem; they are initially unconstrained.

Definition at line 2256 of file ppl_c_implementation_common.cc.

10.21.2.9 int ppl_PIP_Problem_add_to_parameter_space_dimensions (ppl_PIP_Problem_t *pip*, ppl_dimension_type *ds*[ ], size_t *n*) [related]

Sets the space dimensions that are specified in first `n` positions of the array `ds` to be parameter dimensions of problem `pip`. The presence of duplicates in `ds` is a waste but an innocuous one.

Definition at line 2266 of file ppl_c_implementation_common.cc.

10.21.2.10 int ppl_PIP_Problem_clear (ppl_PIP_Problem_t *pip*) [related]

Resets the PIP problem to be a trivial problem of space dimension 0.

Definition at line 2250 of file ppl_c_implementation_common.cc.

10.21.2.11 int ppl_PIP_Problem_constraint_at_index (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type *i*, ppl_const_Constraint_t * *pc*) [related]

Writes at address `pc` a const handle to the `i-th` constraint defining the feasible region of the PIP problem `pip`.

Definition at line 2235 of file ppl_c_implementation_common.cc.

10.21.2.12 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_ALL [related]

Code of PIP problem's "all" cutting strategy.

Definition at line 2480 of file ppl_c_header.h.

10.21.2.13 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_DEEPEST [related]

Code of PIP problem's "deepest" cutting strategy.

Definition at line 2475 of file ppl_c_header.h.

10.21.2.14 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_FIRST [related]

Code of PIP problem's "first" cutting strategy.

Definition at line 2470 of file ppl_c_header.h.

10.21.2.15 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_CUTTING_STRATEGY [related]

Code for the PIP problem's "cutting strategy" control parameter name.

Definition at line 2460 of file ppl_c_header.h.

10.21.2.16 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_PIVOT_ROW_STRATEGY [related]

Code for the PIP problem's "pivot row strategy" control parameter name.

Definition at line 2465 of file ppl_c_header.h.

10.21.2.17 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_FIRST [related]

Code of PIP problem's "first" pivot row strategy.

Definition at line 2485 of file ppl_c_header.h.

10.21.2.18 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_-MAX_COLUMN [related]

Code of PIP problem's "max column" pivot row strategy.

Definition at line 2490 of file ppl_c_header.h.

10.21.2.19 int ppl_PIP_Problem_external_memory_in_bytes (ppl_const_PIP_Problem_t *pip*, size_t * *sz*) [related]

Writes into `*sz` the size in bytes of the memory managed by `pip`.

Definition at line 2373 of file ppl_c_implementation_common.cc.

10.21.2.20 int ppl_PIP_Problem_get_big_parameter_dimension (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *pd*) [related]

Writes into `*pd` the big parameter dimension of PIP problem `pip`.

Definition at line 2349 of file ppl_c_implementation_common.cc.

10.21.2.21 int ppl_PIP_Problem_get_control_parameter (ppl_const_PIP_Problem_t *pip*, int *name*) [related]

Returns the value of control parameter `name` in problem `pip`.

Definition at line 2330 of file ppl_c_implementation_common.cc.

10.21.2.22 int ppl_PIP_Problem_is_satisfiable (ppl_const_PIP_Problem_t *pip*) [related]

Returns a positive integer if `pip` is satisfiable and an optimal solution can be found; returns 0 otherwise.

Definition at line 2297 of file ppl_c_implementation_common.cc.

10.21.2.23 int ppl_PIP_Problem_number_of_constraints (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *m*) [related]

Writes to `m` the number of constraints defining the feasible region of `pip`.

Definition at line 2226 of file ppl_c_implementation_common.cc.

Referenced by ppl_PIP_Problem_constraint_at_index().

10.21.2.24 int ppl_PIP_Problem_number_of_parameter_space_dimensions (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *m*) [related]

Writes to `m` the number of parameter space dimensions of `pip`.

Definition at line 2206 of file ppl_c_implementation_common.cc.

10.21.2.25 int ppl_PIP_Problem_OK (ppl_const_PIP_Problem_t *pip*) [related]

Returns a positive integer if `pip` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `pip` is broken. Useful for debugging purposes.

Definition at line 2324 of file ppl_c_implementation_common.cc.

10.21.2.26 int ppl_PIP_Problem_optimizing_solution (ppl_const_PIP_Problem_t *pip*, ppl_const_PIP_Tree_Node_t * *pip_tree*) [related]

Writes to `pip_tree` an optimizing solution for `pip`, if it exists.

Definition at line 2316 of file ppl_c_implementation_common.cc.

10.21.2.27 int ppl_PIP_Problem_parameter_space_dimensions (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type *ds*[ ]) [related]

Writes in the first positions of the array `ds` all the parameter space dimensions of problem `pip`. If the array is not big enough to hold all of the parameter space dimensions, the behavior is undefined.

Definition at line 2214 of file ppl_c_implementation_common.cc.

10.21.2.28 int ppl_PIP_Problem_set_big_parameter_dimension (ppl_PIP_Problem_t *pip*, ppl_dimension_type *d*) [related]

Sets the big parameter dimension of PIP problem `pip` to `d`.

Definition at line 2357 of file ppl_c_implementation_common.cc.

10.21.2.29 int ppl_PIP_Problem_set_control_parameter (ppl_PIP_Problem_t *pip*, int *value*) [related]

Sets control parameter `value` in problem `pip`.

Definition at line 2339 of file ppl_c_implementation_common.cc.

10.21.2.30 int ppl_PIP_Problem_solution (ppl_const_PIP_Problem_t *pip*, ppl_const_PIP_Tree_Node_t * *pip_tree*) [related]

Writes to `pip_tree` a solution for `pip`, if it exists.

Definition at line 2308 of file ppl_c_implementation_common.cc.

10.21.2.31 int ppl_PIP_Problem_solve (ppl_const_PIP_Problem_t *pip*) [related]

Solves the PIP problem `pip`, returning an exit status.

Returns

`PPL_PIP_PROBLEM_STATUS_UNFEASIBLE` if the PIP problem is not satisfiable; `PPL_PIP_PROBLEM_STATUS_OPTIMIZED` if the PIP problem admits an optimal solution.

Definition at line 2302 of file ppl_c_implementation_common.cc.

10.21.2.32 int ppl_PIP_Problem_space_dimension (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *m*) [related]

Writes to `m` the dimension of the vector space enclosing `pip`.

The vector space dimensions includes both the problem variables and the problem parameters, but they do not include the artificial parameters.

Definition at line 2197 of file ppl_c_implementation_common.cc.

10.21.2.33 int PPL_PIP_PROBLEM_STATUS_OPTIMIZED [related]

Code of the "optimized PIP problem" status.

Definition at line 2455 of file ppl_c_header.h.

10.21.2.34 int PPL_PIP_PROBLEM_STATUS_UNFEASIBLE [related]

Code of the "unfeasible PIP problem" status.

Definition at line 2450 of file ppl_c_header.h.

10.21.2.35 int ppl_PIP_Problem_total_memory_in_bytes (ppl_const_PIP_Problem_t *pip*, size_t * *sz*) [related]

Writes into `*sz` the size in bytes of the memory occupied by `pip`.

Definition at line 2365 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.22 ppl_PIP_Solution_Node_tag Interface Reference

Types and functions for PIP solution nodes.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

- int ppl_PIP_Solution_Node_get_parametric_values (ppl_const_PIP_Solution_Node_t pip_sol, ppl_dimension_type var, ppl_const_Linear_Expression_t *le)

  Writes to `le` a const pointer to the parametric expression of the values of variable `var` in solution node `pip_sol`.

10.22.1 Detailed Description

Types and functions for PIP solution nodes. The types and functions for solution nodes provide an interface towards *PIP_Solution_Node*.

10.22.2 Friends And Related Function Documentation

10.22.2.1 int ppl_PIP_Solution_Node_get_parametric_values (ppl_const_PIP_Solution_Node_t *pip_sol*, ppl_dimension_type *var*, ppl_const_Linear_Expression_t * *le*) [related]

Writes to `le` a const pointer to the parametric expression of the values of variable `var` in solution node `pip_sol`.

The linear expression assigned to `le` will only refer to (problem or artificial) parameters.

Parameters

pip_sol The solution tree node.

var The variable which is queried about.

le The returned expression for variable `var`.

Returns

PPL_ERROR_INVALID_ARGUMENT Returned if `var` is dimension-incompatible with `*this` or if `var` is a problem parameter.

Definition at line 2445 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.23 ppl_PIP_Tree_Node_tag Interface Reference

Types and functions for generic PIP tree nodes.

`#include <ppl_c_header.h>`

Related Functions

(Note that these are not member functions.)

- int ppl_PIP_Tree_Node_as_solution (ppl_const_PIP_Tree_Node_t spip_tree, ppl_const_PIP_Solution_Node_t *dpip_tree)

  Writes to `dpip_tree` the solution node if `spip_tree` is a solution node, and 0 otherwise.

- int ppl_PIP_Tree_Node_as_decision (ppl_const_PIP_Tree_Node_t spip_tree, ppl_const_PIP_Decision_Node_t *dpip_tree)

  Writes to `dpip_tree` the decision node if `spip_tree` is a decision node, and 0 otherwise.

- int ppl_PIP_Tree_Node_get_constraints (ppl_const_PIP_Tree_Node_t pip_tree, ppl_const_Constraint_System_t *pcs)

  Writes to `pcs` the local system of parameter constraints at the pip tree node `pip_tree`.

- int ppl_PIP_Tree_Node_OK (ppl_const_PIP_Tree_Node_t pip)

  Returns a positive integer if `pip_tree` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `pip_tree` is broken. Useful for debugging purposes.

- int ppl_PIP_Tree_Node_number_of_artificials (ppl_const_PIP_Tree_Node_t pip_tree, ppl_dimension_type *m)

  Writes to `m` the number of elements in the artificial parameter sequence in the pip tree node `pip_tree`.

- int ppl_PIP_Tree_Node_begin (ppl_const_PIP_Tree_Node_t pip_tree, ppl_Artificial_Parameter_Sequence_const_iterator_t pit)

  Assigns to `pit` a const iterator "pointing" to the beginning of the artificial parameter sequence in the pip tree node `pip_tree`.

- int ppl_PIP_Tree_Node_end (ppl_const_PIP_Tree_Node_t pip_tree, ppl_Artificial_Parameter_Sequence_const_iterator_t pit)

  Assigns to `pit` a const iterator "pointing" to the end of the artificial parameter sequence in the pip tree node `pip_tree`.

10.23.1 Detailed Description

Types and functions for generic PIP tree nodes. The types and functions for tree nodes provide an interface towards *PIP_Tree_Node*.

10.23.2 Friends And Related Function Documentation

10.23.2.1 int ppl_PIP_Tree_Node_as_decision (ppl_const_PIP_Tree_Node_t *spip_tree*, ppl_const_PIP_Decision_Node_t * *dpip_tree*) [related]

Writes to `dpip_tree` the decision node if `spip_tree` is a decision node, and 0 otherwise.

Definition at line 2389 of file ppl_c_implementation_common.cc.

10.23.2.2 int ppl_PIP_Tree_Node_as_solution (ppl_const_PIP_Tree_Node_t *spip_tree*, ppl_const_PIP_Solution_Node_t * *dpip_tree*) [related]

Writes to `dpip_tree` the solution node if `spip_tree` is a solution node, and 0 otherwise.

Definition at line 2381 of file ppl_c_implementation_common.cc.

10.23.2.3 int ppl_PIP_Tree_Node_begin (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_Artificial_Parameter_Sequence_const_iterator_t *pit*) [related]

Assigns to `pit` a const iterator "pointing" to the beginning of the artificial parameter sequence in the pip tree node `pip_tree`.

Definition at line 2423 of file ppl_c_implementation_common.cc.

10.23.2.4 int ppl_PIP_Tree_Node_end (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_Artificial_Parameter_Sequence_const_iterator_t *pit*) [related]

Assigns to `pit` a const iterator "pointing" to the end of the artificial parameter sequence in the pip tree node `pip_tree`.

Definition at line 2434 of file ppl_c_implementation_common.cc.

10.23.2.5 int ppl_PIP_Tree_Node_get_constraints (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_const_Constraint_System_t * *pcs*) [related]

Writes to `pcs` the local system of parameter constraints at the pip tree node `pip_tree`.

Definition at line 2397 of file ppl_c_implementation_common.cc.

10.23.2.6 int ppl_PIP_Tree_Node_number_of_artificials (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_dimension_type * *m*) [related]

Writes to `m` the number of elements in the artificial parameter sequence in the pip tree node `pip_tree`.

Definition at line 2413 of file ppl_c_implementation_common.cc.

10.23.2.7 int ppl_PIP_Tree_Node_OK (ppl_const_PIP_Tree_Node_t *pip*) [related]

Returns a positive integer if `pip_tree` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `pip_tree` is broken. Useful for debugging purposes.

Definition at line 2407 of file ppl_c_implementation_common.cc.

The documentation for this interface was generated from the following file:

- ppl_c_header.h

10.24 ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag Interface Reference

Types and functions for iterating on the disjuncts of a const ppl_Pointset_Powerset_C_Polyhedron_tag.

Related Functions

(Note that these are not member functions.)

Construction, Initialization and Destruction

- int ppl_new_Pointset_Powerset_C_Polyhedron_const_iterator (ppl_Pointset_Powerset_C_-Polyhedron_const_iterator_t *pit)
  Builds a new 'const iterator' and writes a handle to it at address `pit`.

- int ppl_new_Pointset_Powerset_C_Polyhedron_const_iterator_from_const_iterator (ppl_-Pointset_Powerset_C_Polyhedron_const_iterator_t *pit, ppl_const_Pointset_Powerset_C_-Polyhedron_const_iterator_t y)
  Builds a copy of `y` and writes a handle to it at address `pit`.

- int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_begin (ppl_const_Pointset_Powerset_-C_Polyhedron_t ps, ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t psit)
  Assigns to `psit` a const iterator "pointing" to the beginning of the sequence of disjuncts of `ps`.

- int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_end (ppl_const_Pointset_Powerset_-C_Polyhedron_t ps, ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t psit)
  Assigns to `psit` a const iterator "pointing" past the end of the sequence of disjuncts of `ps`.

- int ppl_delete_Pointset_Powerset_C_Polyhedron_const_iterator (ppl_const_Pointset_Powerset_-C_Polyhedron_const_iterator_t it)
  Invalidates the handle `it`: this makes sure the corresponding resources will eventually be released.

Dereferencing, Increment, Decrement and Equality Testing

- int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_dereference (ppl_const_Pointset_-Powerset_C_Polyhedron_const_iterator_t it, ppl_const_Polyhedron_t *d)
  Dereferences `it` writing a const handle to the resulting disjunct at address `d`.

- int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_increment (ppl_Pointset_Powerset_C_-Polyhedron_const_iterator_t it)
  Increments `it` so that it "points" to the next disjunct.

- int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_decrement (ppl_Pointset_Powerset_-C_Polyhedron_const_iterator_t it)

Decrements `it` so that it "points" to the previous disjunct.

- int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_equal_test (ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t x, ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t y)

  Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

10.24.1 Detailed Description

Types and functions for iterating on the disjuncts of a const ppl_Pointset_Powerset_C_Polyhedron_tag.

10.24.2 Friends And Related Function Documentation

10.24.2.1 int ppl_delete_Pointset_Powerset_C_Polyhedron_const_iterator (ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t *it*) [related]

Invalidates the handle `it`: this makes sure the corresponding resources will eventually be released.

10.24.2.2 int ppl_new_Pointset_Powerset_C_Polyhedron_const_iterator (ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t * *pit*) [related]

Builds a new 'const iterator' and writes a handle to it at address `pit`.

10.24.2.3 int ppl_new_Pointset_Powerset_C_Polyhedron_const_iterator_from_const_iterator (ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t * *pit*, ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t *y*) [related]

Builds a copy of `y` and writes a handle to it at address `pit`.

10.24.2.4 int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_begin (ppl_const_Pointset_Powerset_C_Polyhedron_t *ps*, ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t *psit*) [related]

Assigns to `psit` a const iterator "pointing" to the beginning of the sequence of disjuncts of `ps`.

10.24.2.5 int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_decrement (ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t *it*) [related]

Decrements `it` so that it "points" to the previous disjunct.

10.24.2.6 int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_dereference (ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t *it*, ppl_const_Polyhedron_t * *d*) [related]

Dereferences `it` writing a const handle to the resulting disjunct at address `d`.

Warning

On exit, the disjunct `d` is still owned by the powerset object: any function call on the owning powerset object may invalidate it. Moreover, `d` should **not** be deleted directly: its resources will be released when deleting the owning powerset.

10.24.2.7 int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_end (ppl_const_Pointset_Powerset_C_Polyhedron_t *ps*, ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t *psit*) [related]

Assigns to `psit` a const iterator "pointing" past the end of the sequence of disjuncts of `ps`.

10.24.2.8 int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_equal_test (ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t *x*, ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

10.24.2.9 int ppl_Pointset_Powerset_C_Polyhedron_const_iterator_increment (ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t *it*) [related]

Increments `it` so that it "points" to the next disjunct.

The documentation for this interface was generated from the following file:

- C_interface.dox

10.25 ppl_Pointset_Powerset_C_Polyhedron_iterator_tag Interface Reference

Types and functions for iterating on the disjuncts of a ppl_Pointset_Powerset_C_Polyhedron_tag.

Related Functions

(Note that these are not member functions.)

Construction, Initialization and Destruction

- int ppl_new_Pointset_Powerset_C_Polyhedron_iterator (ppl_Pointset_Powerset_C_Polyhedron_iterator_t *pit)

Builds a new 'iterator' and writes a handle to it at address `pit`.

- int ppl_new_Pointset_Powerset_C_Polyhedron_iterator_from_iterator (ppl_Pointset_Powerset_C_Polyhedron_iterator_t *pit, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t y)

  Builds a copy of `y` *and writes a handle to it at address* `pit`.

- int ppl_Pointset_Powerset_C_Polyhedron_iterator_begin (ppl_Pointset_Powerset_C_Polyhedron_t ps, ppl_Pointset_Powerset_C_Polyhedron_iterator_t psit)

  Assigns to `psit` *an iterator "pointing" to the beginning of the sequence of disjuncts of* `ps`.

- int ppl_Pointset_Powerset_C_Polyhedron_iterator_end (ppl_Pointset_Powerset_C_Polyhedron_t ps, ppl_Pointset_Powerset_C_Polyhedron_iterator_t psit)

  Assigns to `psit` *an iterator "pointing" past the end of the sequence of disjuncts of* `ps`.

- int ppl_delete_Pointset_Powerset_C_Polyhedron_iterator (ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t it)

  Invalidates the handle `it`*: this makes sure the corresponding resources will eventually be released.*

Dereferencing, Increment, Decrement and Equality Testing

- int ppl_Pointset_Powerset_C_Polyhedron_iterator_dereference (ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t it, ppl_const_Polyhedron_t *d)

  Dereferences `it` *writing a const handle to the resulting disjunct at address* `d`.

- int ppl_Pointset_Powerset_C_Polyhedron_iterator_increment (ppl_Pointset_Powerset_C_Polyhedron_iterator_t it)

  Increments `it` *so that it "points" to the next disjunct.*

- int ppl_Pointset_Powerset_C_Polyhedron_iterator_decrement (ppl_Pointset_Powerset_C_Polyhedron_iterator_t it)

  Decrements `it` *so that it "points" to the previous disjunct.*

- int ppl_Pointset_Powerset_C_Polyhedron_iterator_equal_test (ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t x, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t y)

  Returns a positive integer if the iterators corresponding to `x` *and* `y` *are equal; returns 0 if they are different.*

10.25.1 Detailed Description

Types and functions for iterating on the disjuncts of a ppl_Pointset_Powerset_C_Polyhedron_tag.

10.25.2 Friends And Related Function Documentation

10.25.2.1 int ppl_delete_Pointset_Powerset_C_Polyhedron_iterator (ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *it*) [related]

Invalidates the handle `it`: this makes sure the corresponding resources will eventually be released.

10.25.2.2 int ppl_new_Pointset_Powerset_C_Polyhedron_iterator (ppl_Pointset_Powerset_C_-Polyhedron_iterator_t * *pit*) [related]

Builds a new 'iterator' and writes a handle to it at address `pit`.

10.25.2.3 int ppl_new_Pointset_Powerset_C_Polyhedron_iterator_from_-iterator (ppl_Pointset_Powerset_C_Polyhedron_iterator_t * *pit*, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *y*) [related]

Builds a copy of `y` and writes a handle to it at address `pit`.

10.25.2.4 int ppl_Pointset_Powerset_C_Polyhedron_iterator_begin (ppl_Pointset_Powerset_-C_Polyhedron_t *ps*, ppl_Pointset_Powerset_C_Polyhedron_iterator_t *psit*) [related]

Assigns to `psit` an iterator "pointing" to the beginning of the sequence of disjuncts of `ps`.

10.25.2.5 int ppl_Pointset_Powerset_C_Polyhedron_iterator_decrement (ppl_Pointset_Powerset_C_Polyhedron_iterator_t *it*) [related]

Decrements `it` so that it "points" to the previous disjunct.

10.25.2.6 int ppl_Pointset_Powerset_C_Polyhedron_iterator_dereference (ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *it*, ppl_const_Polyhedron_t * *d*) [related]

Dereferences `it` writing a const handle to the resulting disjunct at address `d`.

Note

Even though `it` is an non-const iterator, dereferencing it results in a handle to a **const** disjunct. This is because mutable iterators are meant to allow for the modification of the sequence of disjuncts (e.g., by dropping elements), while preventing direct modifications of the disjuncts they point to.

Warning

On exit, the disjunct `d` is still owned by the powerset object: any function call on the owning powerset object may invalidate it. Moreover, `d` should **not** be deleted directly: its resources will be released when deleting the owning powerset.

10.25.2.7 int ppl_Pointset_Powerset_C_Polyhedron_iterator_end (ppl_Pointset_Powerset_C_Polyhedron_t *ps*, ppl_Pointset_Powerset_C_Polyhedron_iterator_t *psit*) [related]

Assigns to `psit` an iterator "pointing" past the end of the sequence of disjuncts of `ps`.

10.25.2.8 int ppl_Pointset_Powerset_C_Polyhedron_iterator_equal_test (ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *x*, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *y*) [related]

Returns a positive integer if the iterators corresponding to `x` and `y` are equal; returns 0 if they are different.

10.25.2.9 int ppl_Pointset_Powerset_C_Polyhedron_iterator_increment (ppl_Pointset_Powerset_C_Polyhedron_iterator_t *it*) [related]

Increments `it` so that it "points" to the next disjunct.

The documentation for this interface was generated from the following file:

- C_interface.dox

10.26 ppl_Pointset_Powerset_C_Polyhedron_tag Interface Reference

Types and functions for the Pointset_Powerset of C_Polyhedron objects.

Related Functions

(Note that these are not member functions.)

Ad Hoc Functions for Pointset_Powerset domains

- int ppl_Pointset_Powerset_C_Polyhedron_omega_reduce (ppl_const_Pointset_Powerset_C_Polyhedron_t ps)

  Drops from the sequence of disjuncts in `ps` all the non-maximal elements so that `ps` is non-redundant.

- int ppl_Pointset_Powerset_C_Polyhedron_size (ppl_const_Pointset_Powerset_C_Polyhedron_t ps, size_t *sz)

  Writes to `sz` the number of disjuncts in `ps`.

- int ppl_Pointset_Powerset_C_Polyhedron_geometrically_covers_Pointset_Powerset_C_Polyhedron (ppl_const_Pointset_Powerset_C_Polyhedron_t x, ppl_const_Pointset_Powerset_C_Polyhedron_t y)

  Returns a positive integer if powerset `x` geometrically covers powerset `y`; returns 0 otherwise.

- int ppl_Pointset_Powerset_C_Polyhedron_geometrically_equals_Pointset_Powerset_C_Polyhedron (ppl_const_Pointset_Powerset_C_Polyhedron_t x, ppl_const_Pointset_Powerset_C_Polyhedron_t y)

Returns a positive integer if powerset `x` *is geometrically equal to powerset* `y`*; returns 0 otherwise.*

- int ppl_Pointset_Powerset_C_Polyhedron_add_disjunct (ppl_Pointset_Powerset_C_Polyhedron_t ps, ppl_const_Polyhedron_t d)

  Adds to `ps` *a copy of disjunct* `d`*.*

- int ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct (ppl_Pointset_Powerset_C_Polyhedron_t ps, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t cit, ppl_Pointset_Powerset_C_Polyhedron_iterator_t it)

  Drops from `ps` *the disjunct pointed to by* `cit`*, assigning to* `it` *an iterator to the disjunct following* `cit`*.*

- int ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts (ppl_Pointset_Powerset_C_Polyhedron_t ps, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t first, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t last)

  Drops from `ps` *all the disjuncts from* `first` *to* `last` *(excluded).*

- int ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce (ppl_Pointset_Powerset_C_Polyhedron_t ps)

  Modifies `ps` *by (recursively) merging together the pairs of disjuncts whose upper-bound is the same as their set-theoretical union.*

10.26.1 Detailed Description

Types and functions for the Pointset_Powerset of C_Polyhedron objects. The powerset domains can be instantiated by taking as a base domain any fixed semantic geometric description (C and NNC polyhedra, BD and octagonal shapes, boxes and grids). An element of the powerset domain represents a disjunctive collection of base objects (its disjuncts), all having the same space dimension.

Besides the functions that are available in all semantic geometric descriptions (whose documentation is not repeated here), the powerset domain also provides several ad hoc functions. In particular, the iterator types allow for the examination and manipulation of the collection of disjuncts.

10.26.2 Friends And Related Function Documentation

10.26.2.1 int ppl_Pointset_Powerset_C_Polyhedron_add_disjunct (ppl_Pointset_Powerset_C_Polyhedron_t *ps*, ppl_const_Polyhedron_t *d*) [related]

Adds to `ps` a copy of disjunct `d`.

10.26.2.2 int ppl_Pointset_Powerset_C_Polyhedron_drop_disjunct (ppl_Pointset_Powerset_C_Polyhedron_t *ps*, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *cit*, ppl_Pointset_Powerset_C_Polyhedron_iterator_t *it*) [related]

Drops from `ps` the disjunct pointed to by `cit`, assigning to `it` an iterator to the disjunct following `cit`.

10.26.2.3 int ppl_Pointset_Powerset_C_Polyhedron_drop_disjuncts (ppl_Pointset_Powerset_C_Polyhedron_t *ps*, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *first*, ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t *last*) [related]

Drops from `ps` all the disjuncts from `first` to `last` (excluded).

10.26.2.4 int ppl_Pointset_Powerset_C_Polyhedron_geometrically_covers_Pointset_Powerset_C_Polyhedron (ppl_const_Pointset_Powerset_C_Polyhedron_t *x*, ppl_const_Pointset_Powerset_C_Polyhedron_t *y*) [related]

Returns a positive integer if powerset `x` geometrically covers powerset `y`; returns 0 otherwise.

10.26.2.5 int ppl_Pointset_Powerset_C_Polyhedron_geometrically_equals_Pointset_Powerset_C_Polyhedron (ppl_const_Pointset_Powerset_C_Polyhedron_t *x*, ppl_const_Pointset_Powerset_C_Polyhedron_t *y*) [related]

Returns a positive integer if powerset `x` is geometrically equal to powerset `y`; returns 0 otherwise.

10.26.2.6 int ppl_Pointset_Powerset_C_Polyhedron_omega_reduce (ppl_const_Pointset_Powerset_C_Polyhedron_t *ps*) [related]

Drops from the sequence of disjuncts in `ps` all the non-maximal elements so that `ps` is non-redundant.

10.26.2.7 int ppl_Pointset_Powerset_C_Polyhedron_pairwise_reduce (ppl_Pointset_Powerset_C_Polyhedron_t *ps*) [related]

Modifies `ps` by (recursively) merging together the pairs of disjuncts whose upper-bound is the same as their set-theoretical union.

10.26.2.8 int ppl_Pointset_Powerset_C_Polyhedron_size (ppl_const_Pointset_Powerset_C_Polyhedron_t *ps*, size_t * *sz*) [related]

Writes to `sz` the number of disjuncts in `ps`.

Note

If present, Omega-redundant elements will be counted too.

The documentation for this interface was generated from the following file:

- C_interface.dox

10.27 ppl_Polyhedron_tag Interface Reference

Types and functions for the domains of C and NNC convex polyhedra.

Related Functions

(Note that these are not member functions.)

Constructors and Assignment for C_Polyhedron

- int ppl_new_C_Polyhedron_from_space_dimension (ppl_Polyhedron_t *pph, ppl_dimension_type d, int empty)

  Builds a C polyhedron of dimension `d` and writes an handle to it at address `pph`. If `empty` is different from zero, the newly created polyhedron will be empty; otherwise, it will be a universe polyhedron.

- int ppl_new_C_Polyhedron_from_C_Polyhedron (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph)

  Builds a C polyhedron that is a copy of `ph`; writes a handle for the newly created polyhedron at address `pph`.

- int ppl_new_C_Polyhedron_from_C_Polyhedron_with_complexity (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph, int complexity)

  Builds a C polyhedron that is a copy of `ph`; writes a handle for the newly created polyhedron at address `pph`.

- int ppl_new_C_Polyhedron_from_Constraint_System (ppl_Polyhedron_t *pph, ppl_const_Constraint_System_t cs)

  Builds a new C polyhedron from the system of constraints `cs` and writes a handle for the newly created polyhedron at address `pph`.

- int ppl_new_C_Polyhedron_recycle_Constraint_System (ppl_Polyhedron_t *pph, ppl_Constraint_System_t cs)

  Builds a new C polyhedron recycling the system of constraints `cs` and writes a handle for the newly created polyhedron at address `pph`.

- int ppl_new_C_Polyhedron_from_Congruence_System (ppl_Polyhedron_t *pph, ppl_const_Congruence_System_t cs)

  Builds a new C polyhedron from the system of congruences `cs` and writes a handle for the newly created polyhedron at address `pph`.

- int ppl_new_C_Polyhedron_recycle_Congruence_System (ppl_Polyhedron_t *pph, ppl_Congruence_System_t cs)

  Builds a new C polyhedron recycling the system of congruences `cs` and writes a handle for the newly created polyhedron at address `pph`.

- int ppl_assign_C_Polyhedron_from_C_Polyhedron (ppl_Polyhedron_t dst, ppl_const_Polyhedron_t src)

  Assigns a copy of the C polyhedron `src` to the C polyhedron `dst`.

Constructors and Assignment for NNC_Polyhedron

- int ppl_new_NNC_Polyhedron_from_space_dimension (ppl_Polyhedron_t *pph, ppl_dimension_type d, int empty)

Builds an NNC polyhedron of dimension `d` *and writes an handle to it at address* `pph`*. If* `empty` *is different from zero, the newly created polyhedron will be empty; otherwise, it will be a universe polyhedron.*

- int ppl_new_NNC_Polyhedron_from_NNC_Polyhedron (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph)

  Builds an NNC polyhedron that is a copy of `ph`*; writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph, int complexity)

  Builds an NNC polyhedron that is a copy of `ph`*; writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_NNC_Polyhedron_from_Constraint_System (ppl_Polyhedron_t *pph, ppl_const_Constraint_System_t cs)

  Builds a new NNC polyhedron from the system of constraints `cs` *and writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_NNC_Polyhedron_recycle_Constraint_System (ppl_Polyhedron_t *pph, ppl_Constraint_System_t cs)

  Builds a new NNC polyhedron recycling the system of constraints `cs` *and writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_NNC_Polyhedron_from_Congruence_System (ppl_Polyhedron_t *pph, ppl_const_Congruence_System_t cs)

  Builds a new NNC polyhedron from the system of congruences `cs` *and writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_NNC_Polyhedron_recycle_Congruence_System (ppl_Polyhedron_t *pph, ppl_Congruence_System_t cs)

  Builds a new NNC polyhedron recycling the system of congruences `cs` *and writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_assign_NNC_Polyhedron_from_NNC_Polyhedron (ppl_Polyhedron_t dst, ppl_const_Polyhedron_t src)

  Assigns a copy of the NNC polyhedron `src` *to the NNC polyhedron* `dst`*.*

Constructors Behaving as Conversion Operators

Besides the conversions listed here below, the library also provides conversion operators that build a semantic geometric description starting from ***any*** *other semantic geometric description (e.g., ppl_new_Grid_from_C_Polyhedron, ppl_new_C_Polyhedron_from_BD_Shape_mpq_class, etc.). Clearly, the conversion operators are only available if both the source and the target semantic geometric descriptions have been enabled when configuring the library. The conversions also taking as argument a complexity class sometimes provide non-trivial precision/efficiency trade-offs.*

- int ppl_new_C_Polyhedron_from_NNC_Polyhedron (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph)

  Builds a C polyhedron that is a copy of the topological closure of the NNC polyhedron `ph`*; writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_C_Polyhedron_from_NNC_Polyhedron_with_complexity (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph, int complexity)

  Builds a C polyhedron that approximates NNC_Polyhedron `ph`*, using an algorithm whose complexity does not exceed* `complexity`*; writes a handle for the newly created polyhedron at address* `pph`*.*

- int ppl_new_NNC_Polyhedron_from_C_Polyhedron (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph)
  Builds an NNC polyhedron that is a copy of the C polyhedron `ph`; writes a handle for the newly created polyhedron at address `pph`.

- int ppl_new_NNC_Polyhedron_from_C_Polyhedron_with_complexity (ppl_Polyhedron_t *pph, ppl_const_Polyhedron_t ph, int complexity)
  Builds an NNC polyhedron that approximates C_Polyhedron `ph`, using an algorithm whose complexity does not exceed `complexity`; writes a handle for the newly created polyhedron at address `pph`.

Destructor for (C or NNC) Polyhedra

- int ppl_delete_Polyhedron (ppl_const_Polyhedron_t ph)
  Invalidates the handle `ph`: this makes sure the corresponding resources will eventually be released.

Functions that Do Not Modify the Polyhedron

- int ppl_Polyhedron_space_dimension (ppl_const_Polyhedron_t ph, ppl_dimension_type *m)
  Writes to `m` the dimension of the vector space enclosing `ph`.

- int ppl_Polyhedron_affine_dimension (ppl_const_Polyhedron_t ph, ppl_dimension_type *m)
  Writes to `m` the affine dimension of `ph` (not to be confused with the dimension of its enclosing vector space) or 0, if `ph` is empty.

- int ppl_Polyhedron_relation_with_Constraint (ppl_const_Polyhedron_t ph, ppl_const_Constraint_t c)
  Checks the relation between the polyhedron `ph` and the constraint `c`.

- int ppl_Polyhedron_relation_with_Generator (ppl_const_Polyhedron_t ph, ppl_const_Generator_t g)
  Checks the relation between the polyhedron `ph` and the generator `g`.

- int ppl_Polyhedron_get_constraints (ppl_const_Polyhedron_t ph, ppl_const_Constraint_System_t *pcs)
  Writes a const handle to the constraint system defining the polyhedron `ph` at address `pcs`.

- int ppl_Polyhedron_get_congruences (ppl_const_Polyhedron_t ph, ppl_const_Congruence_System_t *pcs)
  Writes at address `pcs` a const handle to a system of congruences approximating the polyhedron `ph`.

- int ppl_Polyhedron_get_minimized_constraints (ppl_const_Polyhedron_t ph, ppl_const_Constraint_System_t *pcs)
  Writes a const handle to the minimized constraint system defining the polyhedron `ph` at address `pcs`.

- int ppl_Polyhedron_get_minimized_congruences (ppl_const_Polyhedron_t ph, ppl_const_Congruence_System_t *pcs)
  Writes at address `pcs` a const handle to a system of minimized congruences approximating the polyhedron `ph`.

- int ppl_Polyhedron_is_empty (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` is empty; returns 0 if `ph` is not empty.

- int ppl_Polyhedron_is_universe (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` is a universe polyhedron; returns 0 if it is not.

- int ppl_Polyhedron_is_bounded (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` is bounded; returns 0 if `ph` is unbounded.

- int ppl_Polyhedron_contains_integer_point (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` contains at least one integer point; returns 0 otherwise.

- int ppl_Polyhedron_is_topologically_closed (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` is topologically closed; returns 0 if `ph` is not topologically closed.

- int ppl_Polyhedron_is_discrete (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` is a discrete set; returns 0 if `ph` is not a discrete set.

- int ppl_Polyhedron_constrains (ppl_Polyhedron_t ph, ppl_dimension_type var)
  Returns a positive integer if `ph` constrains `var`; returns 0 if `ph` does not constrain `var`.

- int ppl_Polyhedron_bounds_from_above (ppl_const_Polyhedron_t ph, ppl_const_Linear_Expression_t le)
  Returns a positive integer if `le` is bounded from above in `ph`; returns 0 otherwise.

- int ppl_Polyhedron_bounds_from_below (ppl_const_Polyhedron_t ph, ppl_const_Linear_Expression_t le)
  Returns a positive integer if `le` is bounded from below in `ph`; returns 0 otherwise.

- int ppl_Polyhedron_maximize_with_point (ppl_const_Polyhedron_t ph, ppl_const_Linear_Expression_t le, ppl_Coefficient_t sup_n, ppl_Coefficient_t sup_d, int *pmaximum, ppl_Generator_t point)
  Returns a positive integer if `ph` is not empty and `le` is bounded from above in `ph`, in which case the supremum value and a point where `le` reaches it are computed.

- int ppl_Polyhedron_maximize (ppl_const_Polyhedron_t ph, ppl_const_Linear_Expression_t le, ppl_Coefficient_t sup_n, ppl_Coefficient_t sup_d, int *pmaximum)
  The same as ppl_Polyhedron_maximize_with_point, but without the output argument for the location where the supremum value is reached.

- int ppl_Polyhedron_minimize_with_point (ppl_const_Polyhedron_t ph, ppl_const_Linear_Expression_t le, ppl_Coefficient_t inf_n, ppl_Coefficient_t inf_d, int *pminimum, ppl_Generator_t point)
  Returns a positive integer if `ph` is not empty and `le` is bounded from below in `ph`, in which case the infimum value and a point where `le` reaches it are computed.

- int ppl_Polyhedron_minimize_with_point (ppl_const_Polyhedron_t ph, ppl_const_Linear_Expression_t le, ppl_Coefficient_t inf_n, ppl_Coefficient_t inf_d, int *pminimum)
  The same as ppl_Polyhedron_minimize_with_point, but without the output argument for the location where the infimum value is reached.

- int ppl_Polyhedron_contains_Polyhedron (ppl_const_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Returns a positive integer if `x` contains or is equal to `y`; returns 0 if it does not.

- int ppl_Polyhedron_strictly_contains_Polyhedron (ppl_const_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Returns a positive integer if `x` strictly contains `y`; returns 0 if it does not.

- int ppl_Polyhedron_is_disjoint_from_Polyhedron (ppl_const_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Returns a positive integer if `x` and `y` are disjoint; returns 0 if they are not.

- int ppl_Polyhedron_equals_Polyhedron (ppl_const_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Returns a positive integer if `x` and `y` are the same polyhedron; returns 0 if they are different.

- int ppl_Polyhedron_OK (ppl_const_Polyhedron_t ph)
  Returns a positive integer if `ph` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `ph` is broken. Useful for debugging purposes.

- int ppl_Polyhedron_external_memory_in_bytes (ppl_const_Polyhedron_t ph, size_t *sz)
  Writes to `sz` a lower bound to the size in bytes of the memory managed by `ph`.

- int ppl_Polyhedron_total_memory_in_bytes (ppl_const_Polyhedron_t ph, size_t *sz)
  Writes to `sz` a lower bound to the size in bytes of the memory managed by `ph`.

Space Dimension Preserving Functions that May Modify the Polyhedron

- int ppl_Polyhedron_add_constraint (ppl_Polyhedron_t ph, ppl_const_Constraint_t c)
  Adds a copy of the constraint `c` to the system of constraints of `ph`.

- int ppl_Polyhedron_add_congruence (ppl_Polyhedron_t ph, ppl_const_Congruence_t c)
  Adds a copy of the congruence `c` to polyhedron of `ph`.

- int ppl_Polyhedron_add_constraints (ppl_Polyhedron_t ph, ppl_const_Constraint_System_t cs)
  Adds a copy of the system of constraints `cs` to the system of constraints of `ph`.

- int ppl_Polyhedron_add_congruences (ppl_Polyhedron_t ph, ppl_const_Congruence_System_t cs)
  Adds a copy of the system of congruences `cs` to the polyhedron `ph`.

- int ppl_Polyhedron_add_recycled_constraints (ppl_Polyhedron_t ph, ppl_Constraint_System_t cs)
  Adds the system of constraints `cs` to the system of constraints of `ph`.

- int ppl_Polyhedron_add_recycled_congruences (ppl_Polyhedron_t ph, ppl_Congruence_System_t cs)
  Adds the system of congruences `cs` to the polyhedron `ph`.

- int ppl_Polyhedron_refine_with_constraint (ppl_Polyhedron_t ph, ppl_const_Constraint_t c)
  Refines `ph` using constraint `c`.

- int ppl_Polyhedron_refine_with_congruence (ppl_Polyhedron_t ph, ppl_const_Congruence_t c)
  Refines `ph` using congruence `c`.

- int ppl_Polyhedron_refine_with_constraints (ppl_Polyhedron_t ph, ppl_const_Constraint_System_t cs)
  Refines `ph` using the constraints in `cs`.

- int ppl_Polyhedron_refine_with_congruences (ppl_Polyhedron_t ph, ppl_const_Congruence_System_t cs)

Refines `ph` *using the congruences in* `cs`.

- int ppl_Polyhedron_intersection_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Intersects `x` *with polyhedron* `y` *and assigns the result to* `x`.

- int ppl_Polyhedron_upper_bound_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Assigns to `x` *an upper bound of* `x` *and* `y`.

- int ppl_Polyhedron_difference_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Same as ppl_Polyhedron_poly_difference_assign(x, y).

- int ppl_Polyhedron_simplify_using_context_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Assigns to `x` *the meet-preserving simplification of* `x` *with respect to context* `y`. *Returns a positive integer if* `x` *and* `y` *have a nonempty intersection; returns* `0` *if they are disjoint.*

- int ppl_Polyhedron_time_elapse_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Assigns to `x` *the time-elapse between the polyhedra* `x` *and* `y`.

- int ppl_Polyhedron_topological_closure_assign (ppl_Polyhedron_t ph)
  Assigns to `ph` *its topological closure.*

- int ppl_Polyhedron_unconstrain_space_dimension (ppl_Polyhedron_t ph, ppl_dimension_type var)
  Modifies `ph` *by unconstraining the space dimension* `var`.

- int ppl_Polyhedron_unconstrain_space_dimensions (ppl_Polyhedron_t ph, ppl_dimension_type ds[ ], size_t n)
  Modifies `ph` *by unconstraining the space dimensions that are specified in the first* `n` *positions of the array* `ds`. *The presence of duplicates in* `ds` *is a waste but an innocuous one.*

- int ppl_Polyhedron_affine_image (ppl_Polyhedron_t ph, ppl_dimension_type var, ppl_const_Linear_Expression_t le, ppl_const_Coefficient_t d)
  Transforms the polyhedron `ph`, *assigning an affine expression to the specified variable.*

- int ppl_Polyhedron_affine_preimage (ppl_Polyhedron_t ph, ppl_dimension_type var, ppl_const_Linear_Expression_t le, ppl_const_Coefficient_t d)
  Transforms the polyhedron `ph`, *substituting an affine expression to the specified variable.*

- int ppl_Polyhedron_bounded_affine_image (ppl_Polyhedron_t ph, ppl_dimension_type var, ppl_const_Linear_Expression_t lb, ppl_const_Linear_Expression_t ub, ppl_const_Coefficient_t d)
  Assigns to `ph` *the image of* `ph` *with respect to the generalized affine transfer relation* $\frac{\mathrm{lb}}{\mathrm{d}} \leq \mathrm{var}' \leq \frac{\mathrm{ub}}{\mathrm{d}}$.

- int ppl_Polyhedron_bounded_affine_preimage (ppl_Polyhedron_t ph, ppl_dimension_type var, ppl_const_Linear_Expression_t lb, ppl_const_Linear_Expression_t ub, ppl_const_Coefficient_t d)
  Assigns to `ph` *the preimage of* `ph` *with respect to the generalized affine transfer relation* $\frac{\mathrm{lb}}{\mathrm{d}} \leq \mathrm{var}' \leq \frac{\mathrm{ub}}{\mathrm{d}}$.

- int ppl_Polyhedron_generalized_affine_image (ppl_Polyhedron_t ph, ppl_dimension_type var, enum ppl_enum_Constraint_Type relsym, ppl_const_Linear_Expression_t le, ppl_const_Coefficient_t d)
  Assigns to `ph` *the image of* `ph` *with respect to the generalized affine transfer relation* $\mathrm{var}' \bowtie \frac{\mathrm{le}}{\mathrm{d}}$, *where* $\bowtie$ *is the relation symbol encoded by* `relsym`.

- int ppl_Polyhedron_generalized_affine_preimage (ppl_Polyhedron_t ph, ppl_dimension_type var, enum ppl_enum_Constraint_Type relsym, ppl_const_Linear_Expression_t le, ppl_const_-Coefficient_t d)

  Assigns to `ph` *the preimage of* `ph` *with respect to the generalized affine transfer relation* $\mathrm{var}' \bowtie \frac{\mathrm{le}}{\mathrm{d}}$, *where* $\bowtie$ *is the relation symbol encoded by* `relsym`.

- int ppl_Polyhedron_generalized_affine_image_lhs_rhs (ppl_Polyhedron_t ph, ppl_const_-Linear_Expression_t lhs, enum ppl_enum_Constraint_Type relsym, ppl_const_Linear_-Expression_t rhs)

  Assigns to `ph` *the image of* `ph` *with respect to the generalized affine transfer relation* $\mathrm{lhs}' \bowtie \mathrm{rhs}$, *where* $\bowtie$ *is the relation symbol encoded by* `relsym`.

- int ppl_Polyhedron_generalized_affine_preimage_lhs_rhs (ppl_Polyhedron_t ph, ppl_const_-Linear_Expression_t lhs, enum ppl_enum_Constraint_Type relsym, ppl_const_Linear_-Expression_t rhs)

  Assigns to `ph` *the preimage of* `ph` *with respect to the generalized affine transfer relation* $\mathrm{lhs}' \bowtie \mathrm{rhs}$, *where* $\bowtie$ *is the relation symbol encoded by* `relsym`.

Functions that May Modify the Dimension of the Vector Space

- int ppl_Polyhedron_concatenate_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)

  Seeing a polyhedron as a set of tuples (its points), assigns to `x` *all the tuples that can be obtained by concatenating, in the order given, a tuple of* `x` *with a tuple of* `y`.

- int ppl_Polyhedron_add_space_dimensions_and_embed (ppl_Polyhedron_t ph, ppl_dimension_-type d)

  Adds `d` *new dimensions to the space enclosing the polyhedron* `ph` *and to* `ph` *itself.*

- int ppl_Polyhedron_add_space_dimensions_and_project (ppl_Polyhedron_t ph, ppl_dimension_-type d)

  Adds `d` *new dimensions to the space enclosing the polyhedron* `ph`.

- int ppl_Polyhedron_remove_space_dimensions (ppl_Polyhedron_t ph, ppl_dimension_type ds[ ], size_t n)

  Removes from the vector space enclosing `ph` *the space dimensions that are specified in first* `n` *positions of the array* `ds`. *The presence of duplicates in* `ds` *is a waste but an innocuous one.*

- int ppl_Polyhedron_remove_higher_space_dimensions (ppl_Polyhedron_t ph, ppl_dimension_-type d)

  Removes the higher dimensions from the vector space enclosing `ph` *so that, upon successful return, the new space dimension is* `d`.

- int ppl_Polyhedron_map_space_dimensions (ppl_Polyhedron_t ph, ppl_dimension_type maps[ ], size_t n)

  Remaps the dimensions of the vector space according to a partial function. This function is specified by means of the `maps` *array, which has* `n` *entries.*

- int ppl_Polyhedron_expand_space_dimension (ppl_Polyhedron_t ph, ppl_dimension_type d, ppl_dimension_type m)

  Expands the d-th dimension of the vector space enclosing `ph` *to* `m` *new space dimensions.*

- int ppl_Polyhedron_fold_space_dimensions (ppl_Polyhedron_t ph, ppl_dimension_type ds[ ], size_t n, ppl_dimension_type d)

  Modifies `ph` *by folding the space dimensions contained in the first* `n` *positions of the array* `ds` *into dimension* `d`. *The presence of duplicates in* `ds` *is a waste but an innocuous one.*

Input/Output Functions

- int ppl_io_print_Polyhedron (ppl_const_Polyhedron_t x)
  Prints `x` to `stdout`.
- int ppl_io_fprint_Polyhedron (FILE *stream, ppl_const_Polyhedron_t x)
  Prints `x` to the given output `stream`.
- int ppl_io_asprint_Polyhedron (char **strp, ppl_const_Polyhedron_t x)
  Prints `x` to a malloc-allocated string, a pointer to which is returned via `strp`.
- int ppl_Polyhedron_ascii_dump (ppl_const_Polyhedron_t x, FILE *stream)
  Dumps an ascii representation of `x` on `stream`.
- int ppl_Polyhedron_ascii_load (ppl_Polyhedron_t x, FILE *stream)
  Loads an ascii representation of `x` from `stream`.

Ad Hoc Functions for (C or NNC) Polyhedra

The functions listed here below, being specific of the polyhedron domains, do not have a correspondence in other semantic geometric descriptions.

- int ppl_new_C_Polyhedron_from_Generator_System (ppl_Polyhedron_t *pph, ppl_const_Generator_System_t gs)
  Builds a new C polyhedron from the system of generators `gs` and writes a handle for the newly created polyhedron at address `pph`.
- int ppl_new_C_Polyhedron_recycle_Generator_System (ppl_Polyhedron_t *pph, ppl_Generator_System_t gs)
  Builds a new C polyhedron recycling the system of generators `gs` and writes a handle for the newly created polyhedron at address `pph`.
- int ppl_new_NNC_Polyhedron_from_Generator_System (ppl_Polyhedron_t *pph, ppl_const_Generator_System_t gs)
  Builds a new NNC polyhedron from the system of generators `gs` and writes a handle for the newly created polyhedron at address `pph`.
- int ppl_new_NNC_Polyhedron_recycle_Generator_System (ppl_Polyhedron_t *pph, ppl_Generator_System_t gs)
  Builds a new NNC polyhedron recycling the system of generators `gs` and writes a handle for the newly created polyhedron at address `pph`.
- int ppl_Polyhedron_get_generators (ppl_const_Polyhedron_t ph, ppl_const_Generator_System_t *pgs)
  Writes a const handle to the generator system defining the polyhedron `ph` at address `pgs`.
- int ppl_Polyhedron_get_minimized_generators (ppl_const_Polyhedron_t ph, ppl_const_Generator_System_t *pgs)
  Writes a const handle to the minimized generator system defining the polyhedron `ph` at address `pgs`.
- int ppl_Polyhedron_add_generator (ppl_Polyhedron_t ph, ppl_const_Generator_t g)
  Adds a copy of the generator `g` to the system of generators of `ph`.

- int ppl_Polyhedron_add_generators (ppl_Polyhedron_t ph, ppl_const_Generator_System_t gs)
  Adds a copy of the system of generators `gs` to the system of generators of `ph`.

- int ppl_Polyhedron_add_recycled_generators (ppl_Polyhedron_t ph, ppl_Generator_System_t gs)
  Adds the system of generators `gs` to the system of generators of `ph`.

- int ppl_Polyhedron_poly_hull_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Assigns to `x` the poly-hull of `x` and `y`.

- int ppl_Polyhedron_poly_difference_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  Assigns to `x` the poly-difference of `x` and `y`.

- int wrap_assign (ppl_Polyhedron_t ph, ppl_dimension_type ds[ ], size_t n, ppl_enum_Bounded_Integer_Type_Width w, ppl_enum_Bounded_Integer_Type_Representation r, ppl_enum_Bounded_Integer_Type_Overflow o, const ppl_const_Constraint_System_t *pcs, unsigned complexity_threshold, int wrap_individually)
  Assigns to `ph` the polyhedron obtained from `ph` by "wrapping" the vector space defined by the first `n` space dimensions in `ds[]`.

- int ppl_Polyhedron_BHRZ03_widening_assign_with_tokens (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, unsigned *tp)
  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the BHRZ03-widening of `x` and `y`. If `tp` is not the null pointer, the widening with tokens delay technique is applied with `*tp` available tokens.

- int ppl_Polyhedron_H79_widening_assign_with_tokens (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, unsigned *tp)
  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the H79-widening of `x` and `y`. If `tp` is not the null pointer, the widening with tokens delay technique is applied with `*tp` available tokens.

- int ppl_Polyhedron_BHRZ03_widening_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the BHRZ03-widening of `x` and `y`.

- int ppl_Polyhedron_H79_widening_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y)
  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the H79-widening of `x` and `y`.

- int ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs, unsigned *tp)
  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the BHRZ03-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`. If `tp` is not the null pointer, the widening with tokens delay technique is applied with `*tp` available tokens.

- int ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs, unsigned *tp)
  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the H79-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`. If `tp` is not the null pointer, the widening with tokens delay technique is applied with `*tp` available tokens.

- int ppl_Polyhedron_limited_BHRZ03_extrapolation_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs)

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the BHRZ03-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`.

- int ppl_Polyhedron_limited_H79_extrapolation_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs)

  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the H79-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`.

- int ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs, unsigned *tp)

  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the BHRZ03-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`. If `tp` is not the null pointer, the widening with tokens delay technique is applied with `*tp` available tokens.

- int ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs, unsigned *tp)

  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the H79-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`. If `tp` is not the null pointer, the widening with tokens delay technique is applied with `*tp` available tokens.

- int ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs)

  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the BHRZ03-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`.

- int ppl_Polyhedron_bounded_H79_extrapolation_assign (ppl_Polyhedron_t x, ppl_const_Polyhedron_t y, ppl_const_Constraint_System_t cs)

  If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the H79-widening of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`.

10.27.1 Detailed Description

Types and functions for the domains of C and NNC convex polyhedra. The types and functions for convex polyhedra provide a single interface for accessing both topologically closed (C) and not necessarily closed (NNC) convex polyhedra. The distinction between C and NNC polyhedra need only be explicitly stated when *creating* or *assigning* a polyhedron object, by means of one of the functions `ppl_new_*` and `ppl_assign_*`.

Having a single datatype does not mean that C and NNC polyhedra can be freely interchanged: as specified in the main manual, most library functions require their arguments to be topologically and/or space-dimension compatible.

10.27.2 Friends And Related Function Documentation

10.27.2.1 int ppl_assign_C_Polyhedron_from_C_Polyhedron (ppl_Polyhedron_t *dst*, ppl_const_Polyhedron_t *src*) [related]

Assigns a copy of the C polyhedron `src` to the C polyhedron `dst`.

10.27.2.2 int ppl_assign_NNC_Polyhedron_from_NNC_Polyhedron (ppl_Polyhedron_t *dst*, ppl_const_Polyhedron_t *src*) [related]

Assigns a copy of the NNC polyhedron `src` to the NNC polyhedron `dst`.

10.27.2.3 int ppl_delete_Polyhedron (ppl_const_Polyhedron_t *ph*) [related]

Invalidates the handle `ph`: this makes sure the corresponding resources will eventually be released.

10.27.2.4 int ppl_io_asprint_Polyhedron (char ** *strp*, ppl_const_Polyhedron_t *x*) [related]

Prints `x` to a malloc-allocated string, a pointer to which is returned via `strp`.

10.27.2.5 int ppl_io_fprint_Polyhedron (FILE * *stream*, ppl_const_Polyhedron_t *x*) [related]

Prints `x` to the given output `stream`.

10.27.2.6 int ppl_io_print_Polyhedron (ppl_const_Polyhedron_t *x*) [related]

Prints `x` to `stdout`.

10.27.2.7 int ppl_new_C_Polyhedron_from_C_Polyhedron (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*) [related]

Builds a C polyhedron that is a copy of `ph`; writes a handle for the newly created polyhedron at address `pph`.

10.27.2.8 int ppl_new_C_Polyhedron_from_C_Polyhedron_with_complexity (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*, int *complexity*) [related]

Builds a C polyhedron that is a copy of ph; writes a handle for the newly created polyhedron at address pph.

Note

The complexity argument is ignored.

10.27.2.9 int ppl_new_C_Polyhedron_from_Congruence_System (ppl_Polyhedron_t * *pph*, ppl_const_Congruence_System_t *cs*) [related]

Builds a new C polyhedron from the system of congruences cs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of cs.

10.27.2.10 int ppl_new_C_Polyhedron_from_Constraint_System (ppl_Polyhedron_t * *pph*, ppl_const_Constraint_System_t *cs*) [related]

Builds a new C polyhedron from the system of constraints cs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of cs.

10.27.2.11 int ppl_new_C_Polyhedron_from_Generator_System (ppl_Polyhedron_t * *pph*, ppl_const_Generator_System_t *gs*) [related]

Builds a new C polyhedron from the system of generators gs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of gs.

10.27.2.12 int ppl_new_C_Polyhedron_from_NNC_Polyhedron (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*) [related]

Builds a C polyhedron that is a copy of the topological closure of the NNC polyhedron ph; writes a handle for the newly created polyhedron at address pph.

10.27.2.13 int ppl_new_C_Polyhedron_from_NNC_Polyhedron_with_complexity (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*, int *complexity*) [related]

Builds a C polyhedron that approximates NNC_Polyhedron ph, using an algorithm whose complexity does not exceed complexity; writes a handle for the newly created polyhedron at address pph.

Note

The complexity argument, which can take values PPL_COMPLEXITY_CLASS_POLYNOMIAL, PPL_COMPLEXITY_CLASS_SIMPLEX and PPL_COMPLEXITY_CLASS_ANY, is ignored since the exact constructor has polynomial complexity.

10.27.2.14 int ppl_new_C_Polyhedron_from_space_dimension (ppl_Polyhedron_t * *pph*, ppl_dimension_type *d*, int *empty*) [related]

Builds a C polyhedron of dimension d and writes an handle to it at address pph. If empty is different from zero, the newly created polyhedron will be empty; otherwise, it will be a universe polyhedron.

10.27.2.15 int ppl_new_C_Polyhedron_recycle_Congruence_System (ppl_Polyhedron_t * *pph*, ppl_Congruence_System_t *cs*) [related]

Builds a new C polyhedron recycling the system of congruences cs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of cs.

Warning

This function modifies the congruence system referenced by cs: upon return, no assumption can be made on its value.

10.27.2.16 int ppl_new_C_Polyhedron_recycle_Constraint_System (ppl_Polyhedron_t * *pph*, ppl_Constraint_System_t *cs*) [related]

Builds a new C polyhedron recycling the system of constraints cs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of cs.

Warning

This function modifies the constraint system referenced by cs: upon return, no assumption can be made on its value.

10.27.2.17 int ppl_new_C_Polyhedron_recycle_Generator_System (ppl_Polyhedron_t * *pph*, ppl_Generator_System_t *gs*) [related]

Builds a new C polyhedron recycling the system of generators gs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of gs.

Warning

This function modifies the generator system referenced by `gs:` upon return, no assumption can be made on its value.

10.27.2.18 int ppl_new_NNC_Polyhedron_from_C_Polyhedron (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*) [related]

Builds an NNC polyhedron that is a copy of the C polyhedron `ph`; writes a handle for the newly created polyhedron at address `pph`.

10.27.2.19 int ppl_new_NNC_Polyhedron_from_C_Polyhedron_with_complexity (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*, int *complexity*) [related]

Builds an NNC polyhedron that approximates C_Polyhedron `ph`, using an algorithm whose complexity does not exceed `complexity`; writes a handle for the newly created polyhedron at address `pph`.

Note

The complexity argument, which can take values `PPL_COMPLEXITY_CLASS_POLYNOMIAL`, `PPL_COMPLEXITY_CLASS_SIMPLEX` and `PPL_COMPLEXITY_CLASS_ANY`, is ignored since the exact constructor has polynomial complexity.

10.27.2.20 int ppl_new_NNC_Polyhedron_from_Congruence_System (ppl_Polyhedron_t * *pph*, ppl_const_Congruence_System_t *cs*) [related]

Builds a new NNC polyhedron from the system of congruences `cs` and writes a handle for the newly created polyhedron at address `pph`.

The new polyhedron will inherit the space dimension of `cs`.

10.27.2.21 int ppl_new_NNC_Polyhedron_from_Constraint_System (ppl_Polyhedron_t * *pph*, ppl_const_Constraint_System_t *cs*) [related]

Builds a new NNC polyhedron from the system of constraints `cs` and writes a handle for the newly created polyhedron at address `pph`.

The new polyhedron will inherit the space dimension of `cs`.

10.27.2.22 int ppl_new_NNC_Polyhedron_from_Generator_System (ppl_Polyhedron_t * *pph*, ppl_const_Generator_System_t *gs*) [related]

Builds a new NNC polyhedron from the system of generators `gs` and writes a handle for the newly created polyhedron at address `pph`.

The new polyhedron will inherit the space dimension of gs.

10.27.2.23 int ppl_new_NNC_Polyhedron_from_NNC_Polyhedron (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*) [related]

Builds an NNC polyhedron that is a copy of ph; writes a handle for the newly created polyhedron at address pph.

10.27.2.24 int ppl_new_NNC_Polyhedron_from_NNC_Polyhedron_with_complexity (ppl_Polyhedron_t * *pph*, ppl_const_Polyhedron_t *ph*, int *complexity*) [related]

Builds an NNC polyhedron that is a copy of ph; writes a handle for the newly created polyhedron at address pph.

Note

The complexity argument is ignored.

10.27.2.25 int ppl_new_NNC_Polyhedron_from_space_dimension (ppl_Polyhedron_t * *pph*, ppl_dimension_type *d*, int *empty*) [related]

Builds an NNC polyhedron of dimension d and writes an handle to it at address pph. If empty is different from zero, the newly created polyhedron will be empty; otherwise, it will be a universe polyhedron.

10.27.2.26 int ppl_new_NNC_Polyhedron_recycle_Congruence_System (ppl_Polyhedron_t * *pph*, ppl_Congruence_System_t *cs*) [related]

Builds a new NNC polyhedron recycling the system of congruences cs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of cs.

Warning

This function modifies the congruence system referenced by cs: upon return, no assumption can be made on its value.

10.27.2.27 int ppl_new_NNC_Polyhedron_recycle_Constraint_System (ppl_Polyhedron_t * *pph*, ppl_Constraint_System_t *cs*) [related]

Builds a new NNC polyhedron recycling the system of constraints cs and writes a handle for the newly created polyhedron at address pph.

The new polyhedron will inherit the space dimension of cs.

Warning

This function modifies the constraint system referenced by `cs:` upon return, no assumption can be made on its value.

10.27.2.28 int ppl_new_NNC_Polyhedron_recycle_Generator_System (ppl_Polyhedron_t * *pph*, ppl_Generator_System_t *gs*) [related]

Builds a new NNC polyhedron recycling the system of generators `gs` and writes a handle for the newly created polyhedron at address `pph`.

The new polyhedron will inherit the space dimension of `gs`.

Warning

This function modifies the generator system referenced by `gs:` upon return, no assumption can be made on its value.

10.27.2.29 int ppl_Polyhedron_add_congruence (ppl_Polyhedron_t *ph*, ppl_const_Congruence_t *c*) [related]

Adds a copy of the congruence `c` to polyhedron of `ph`.

10.27.2.30 int ppl_Polyhedron_add_congruences (ppl_Polyhedron_t *ph*, ppl_const_Congruence_System_t *cs*) [related]

Adds a copy of the system of congruences `cs` to the polyhedron `ph`.

10.27.2.31 int ppl_Polyhedron_add_constraint (ppl_Polyhedron_t *ph*, ppl_const_Constraint_t *c*) [related]

Adds a copy of the constraint `c` to the system of constraints of `ph`.

10.27.2.32 int ppl_Polyhedron_add_constraints (ppl_Polyhedron_t *ph*, ppl_const_Constraint_System_t *cs*) [related]

Adds a copy of the system of constraints `cs` to the system of constraints of `ph`.

10.27.2.33 int ppl_Polyhedron_add_generator (ppl_Polyhedron_t *ph*, ppl_const_Generator_t *g*) [related]

Adds a copy of the generator `g` to the system of generators of `ph`.

10.27.2.34 int ppl_Polyhedron_add_generators (ppl_Polyhedron_t *ph*, ppl_const_Generator_System_t *gs*) [related]

Adds a copy of the system of generators `gs` to the system of generators of `ph`.

10.27.2.35 int ppl_Polyhedron_add_recycled_congruences (ppl_Polyhedron_t *ph*, ppl_Congruence_System_t *cs*) [related]

Adds the system of congruences `cs` to the polyhedron `ph`.

Warning

This function modifies the congruence system referenced by `cs:` upon return, no assumption can be made on its value.

10.27.2.36 int ppl_Polyhedron_add_recycled_constraints (ppl_Polyhedron_t *ph*, ppl_Constraint_System_t *cs*) [related]

Adds the system of constraints `cs` to the system of constraints of `ph`.

Warning

This function modifies the constraint system referenced by `cs:` upon return, no assumption can be made on its value.

10.27.2.37 int ppl_Polyhedron_add_recycled_generators (ppl_Polyhedron_t *ph*, ppl_Generator_System_t *gs*) [related]

Adds the system of generators `gs` to the system of generators of `ph`.

Warning

This function modifies the generator system referenced by `gs:` upon return, no assumption can be made on its value.

10.27.2.38 int ppl_Polyhedron_add_space_dimensions_and_embed (ppl_Polyhedron_t *ph*, ppl_dimension_type *d*) [related]

Adds `d` new dimensions to the space enclosing the polyhedron `ph` and to `ph` itself.

10.27.2.39 int ppl_Polyhedron_add_space_dimensions_and_project (ppl_Polyhedron_t *ph*, ppl_dimension_type *d*) [related]

Adds `d` new dimensions to the space enclosing the polyhedron `ph`.

10.27.2.40 int ppl_Polyhedron_affine_dimension (ppl_const_Polyhedron_t *ph*, ppl_dimension_type * *m*) [related]

Writes to `m` the affine dimension of `ph` (not to be confused with the dimension of its enclosing vector space) or 0, if `ph` is empty.

10.27.2.41 int ppl_Polyhedron_affine_image (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*, ppl_const_Linear_Expression_t *le*, ppl_const_Coefficient_t *d*) [related]

Transforms the polyhedron `ph`, assigning an affine expression to the specified variable.

Parameters

ph The polyhedron that is transformed;

var The variable to which the affine expression is assigned;

le The numerator of the affine expression;

d The denominator of the affine expression.

10.27.2.42 int ppl_Polyhedron_affine_preimage (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*, ppl_const_Linear_Expression_t *le*, ppl_const_Coefficient_t *d*) [related]

Transforms the polyhedron `ph`, substituting an affine expression to the specified variable.

Parameters

ph The polyhedron that is transformed;

var The variable to which the affine expression is substituted;

le The numerator of the affine expression;

d The denominator of the affine expression.

10.27.2.43 int ppl_Polyhedron_ascii_dump (ppl_const_Polyhedron_t *x*, FILE * *stream*) [related]

Dumps an ascii representation of `x` on `stream`.

10.27.2.44 int ppl_Polyhedron_ascii_load (ppl_Polyhedron_t *x*, FILE * *stream*) [related]

Loads an ascii representation of x from stream.

10.27.2.45 int ppl_Polyhedron_BHRZ03_widening_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

If the polyhedron y is contained in (or equal to) the polyhedron x, assigns to x the *BHRZ03-widening* of x and y.

10.27.2.46 int ppl_Polyhedron_BHRZ03_widening_assign_with_tokens (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, unsigned * *tp*) [related]

If the polyhedron y is contained in (or equal to) the polyhedron x, assigns to x the *BHRZ03-widening* of x and y. If tp is not the null pointer, the *widening with tokens* delay technique is applied with *tp available tokens.

10.27.2.47 int ppl_Polyhedron_bounded_affine_image (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*, ppl_const_Linear_Expression_t *lb*, ppl_const_Linear_Expression_t *ub*, ppl_const_Coefficient_t *d*) [related]

Assigns to ph the image of ph with respect to the *generalized affine transfer relation* $\frac{\mathrm{lb}}{\mathrm{d}} \leq \mathrm{var}' \leq \frac{\mathrm{ub}}{\mathrm{d}}$.

Parameters

ph The polyhedron that is transformed;

var The variable bounded by the generalized affine transfer relation;

lb The numerator of the lower bounding affine expression;

ub The numerator of the upper bounding affine expression;

d The (common) denominator of the lower and upper bounding affine expressions.

10.27.2.48 int ppl_Polyhedron_bounded_affine_preimage (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*, ppl_const_Linear_Expression_t *lb*, ppl_const_Linear_Expression_t *ub*, ppl_const_Coefficient_t *d*) [related]

Assigns to ph the preimage of ph with respect to the *generalized affine transfer relation* $\frac{\mathrm{lb}}{\mathrm{d}} \leq \mathrm{var}' \leq \frac{\mathrm{ub}}{\mathrm{d}}$.

Parameters

ph The polyhedron that is transformed;

var The variable bounded by the generalized affine transfer relation;

lb The numerator of the lower bounding affine expression;

ub The numerator of the upper bounding affine expression;

d The (common) denominator of the lower and upper bounding affine expressions.

10.27.2.49 int ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*) [related]

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the *BHRZ03-widening* of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`.

10.27.2.50 int ppl_Polyhedron_bounded_BHRZ03_extrapolation_assign_with_tokens (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*, unsigned * *tp*) [related]

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the *BHRZ03-widening* of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`. If `tp` is not the null pointer, the *widening with tokens* delay technique is applied with `*tp` available tokens.

10.27.2.51 int ppl_Polyhedron_bounded_H79_extrapolation_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*) [related]

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the *H79-widening* of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`.

10.27.2.52 int ppl_Polyhedron_bounded_H79_extrapolation_assign_with_tokens (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*, unsigned * *tp*) [related]

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the *H79-widening* of `x` and `y` intersected with the constraints in `cs` that are satisfied by all the points of `x`, further intersected with all the constraints of the form $\pm v \leq r$ and $\pm v < r$, with $r \in \mathbb{Q}$, that are satisfied by all the points of `x`. If `tp` is not the null pointer, the *widening with tokens* delay technique is applied with `*tp` available tokens.

10.27.2.53 int ppl_Polyhedron_bounds_from_above (ppl_const_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *le*) [related]

Returns a positive integer if `le` is bounded from above in `ph`; returns 0 otherwise.

10.27.2.54 int ppl_Polyhedron_bounds_from_below (ppl_const_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *le*) [related]

Returns a positive integer if `le` is bounded from below in `ph`; returns 0 otherwise.

10.27.2.55 int ppl_Polyhedron_concatenate_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Seeing a polyhedron as a set of tuples (its points), assigns to `x` all the tuples that can be obtained by concatenating, in the order given, a tuple of `x` with a tuple of `y`.

10.27.2.56 int ppl_Polyhedron_constrains (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*) [related]

Returns a positive integer if `ph` constrains `var`; returns 0 if `ph` does not constrain `var`.

10.27.2.57 int ppl_Polyhedron_contains_integer_point (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if `ph` contains at least one integer point; returns 0 otherwise.

10.27.2.58 int ppl_Polyhedron_contains_Polyhedron (ppl_const_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Returns a positive integer if `x` contains or is equal to `y`; returns 0 if it does not.

10.27.2.59 int ppl_Polyhedron_difference_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Same as ppl_Polyhedron_poly_difference_assign(x, y).

10.27.2.60 int ppl_Polyhedron_equals_Polyhedron (ppl_const_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Returns a positive integer if `x` and `y` are the same polyhedron; returns 0 if they are different.

Note that `x` and `y` may be topology- and/or dimension-incompatible polyhedra: in those cases, the value 0 is returned.

10.27.2.61 int ppl_Polyhedron_expand_space_dimension (ppl_Polyhedron_t *ph*, ppl_dimension_type *d*, ppl_dimension_type *m*) [related]

Expands the d-th dimension of the vector space enclosing `ph` to `m` new space dimensions.

10.27.2.62 int ppl_Polyhedron_external_memory_in_bytes (ppl_const_Polyhedron_t *ph*, size_t * *sz*) [related]

Writes to `sz` a lower bound to the size in bytes of the memory managed by `ph`.

10.27.2.63 int ppl_Polyhedron_fold_space_dimensions (ppl_Polyhedron_t *ph*, ppl_dimension_type *ds*[ ], size_t *n*, ppl_dimension_type *d*) [related]

Modifies `ph` by *folding* the space dimensions contained in the first `n` positions of the array `ds` into dimension `d`. The presence of duplicates in `ds` is a waste but an innocuous one.

10.27.2.64 int ppl_Polyhedron_generalized_affine_image (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*, enum ppl_enum_Constraint_Type *relsym*, ppl_const_Linear_Expression_t *le*, ppl_const_Coefficient_t *d*) [related]

Assigns to `ph` the image of `ph` with respect to the *generalized affine transfer relation* $\mathrm{var}' \bowtie \frac{\mathrm{le}}{\mathrm{d}}$, where $\bowtie$ is the relation symbol encoded by `relsym`.

Parameters

ph The polyhedron that is transformed;

var The left hand side variable of the generalized affine transfer relation;

relsym The relation symbol;

le The numerator of the right hand side affine expression;

d The denominator of the right hand side affine expression.

10.27.2.65 int ppl_Polyhedron_generalized_affine_image_lhs_rhs (ppl_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *lhs*, enum ppl_enum_Constraint_Type *relsym*, ppl_const_Linear_Expression_t *rhs*) [related]

Assigns to `ph` the image of `ph` with respect to the *generalized affine transfer relation* $\mathrm{lhs}' \bowtie \mathrm{rhs}$, where $\bowtie$ is the relation symbol encoded by `relsym`.

Parameters

ph The polyhedron that is transformed;

lhs The left hand side affine expression;

relsym The relation symbol;

rhs The right hand side affine expression.

10.27.2.66 int ppl_Polyhedron_generalized_affine_preimage (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*, enum ppl_enum_Constraint_Type *relsym*, ppl_const_Linear_Expression_t *le*, ppl_const_Coefficient_t *d*) [related]

Assigns to `ph` the preimage of `ph` with respect to the *generalized affine transfer relation* $\mathrm{var}' \bowtie \frac{\mathrm{le}}{\mathrm{d}}$, where $\bowtie$ is the relation symbol encoded by `relsym`.

Parameters

ph The polyhedron that is transformed;

var The left hand side variable of the generalized affine transfer relation;

relsym The relation symbol;

le The numerator of the right hand side affine expression;

d The denominator of the right hand side affine expression.

10.27.2.67 int ppl_Polyhedron_generalized_affine_preimage_lhs_rhs (ppl_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *lhs*, enum ppl_enum_Constraint_Type *relsym*, ppl_const_Linear_Expression_t *rhs*) [related]

Assigns to `ph` the preimage of `ph` with respect to the *generalized affine transfer relation* $\mathrm{lhs}' \bowtie \mathrm{rhs}$, where $\bowtie$ is the relation symbol encoded by `relsym`.

Parameters

ph The polyhedron that is transformed;

lhs The left hand side affine expression;

relsym The relation symbol;

rhs The right hand side affine expression.

10.27.2.68 int ppl_Polyhedron_get_congruences (ppl_const_Polyhedron_t *ph*, ppl_const_Congruence_System_t * *pcs*) [related]

Writes at address `pcs` a const handle to a system of congruences approximating the polyhedron `ph`.

10.27.2.69 int ppl_Polyhedron_get_constraints (ppl_const_Polyhedron_t *ph*, ppl_const_Constraint_System_t * *pcs*) [related]

Writes a const handle to the constraint system defining the polyhedron `ph` at address `pcs`.

10.27.2.70 int ppl_Polyhedron_get_generators (ppl_const_Polyhedron_t *ph*, ppl_const_Generator_System_t * *pgs*) [related]

Writes a const handle to the generator system defining the polyhedron `ph` at address `pgs`.

10.27.2.71 int ppl_Polyhedron_get_minimized_congruences (ppl_const_Polyhedron_t *ph*, ppl_const_Congruence_System_t * *pcs*) [related]

Writes at address `pcs` a const handle to a system of minimized congruences approximating the polyhedron `ph`.

10.27.2.72 int ppl_Polyhedron_get_minimized_constraints (ppl_const_Polyhedron_t *ph*, ppl_const_Constraint_System_t * *pcs*) [related]

Writes a const handle to the minimized constraint system defining the polyhedron `ph` at address `pcs`.

10.27.2.73 int ppl_Polyhedron_get_minimized_generators (ppl_const_Polyhedron_t *ph*, ppl_const_Generator_System_t * *pgs*) [related]

Writes a const handle to the minimized generator system defining the polyhedron `ph` at address `pgs`.

10.27.2.74 int ppl_Polyhedron_H79_widening_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the *H79-widening* of `x` and `y`.

10.27.2.75 int ppl_Polyhedron_H79_widening_assign_with_tokens (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, unsigned * *tp*) [related]

If the polyhedron `y` is contained in (or equal to) the polyhedron `x`, assigns to `x` the *H79-widening* of `x` and `y`. If `tp` is not the null pointer, the *widening with tokens* delay technique is applied with `*tp` available tokens.

10.27.2.76 int ppl_Polyhedron_intersection_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Intersects `x` with polyhedron `y` and assigns the result to `x`.

10.27.2.77 int ppl_Polyhedron_is_bounded (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if ph is bounded; returns 0 if ph is unbounded.

10.27.2.78 int ppl_Polyhedron_is_discrete (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if ph is a discrete set; returns 0 if ph is not a discrete set.

10.27.2.79 int ppl_Polyhedron_is_disjoint_from_Polyhedron (ppl_const_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Returns a positive integer if x and y are disjoint; returns 0 if they are not.

10.27.2.80 int ppl_Polyhedron_is_empty (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if ph is empty; returns 0 if ph is not empty.

10.27.2.81 int ppl_Polyhedron_is_topologically_closed (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if ph is topologically closed; returns 0 if ph is not topologically closed.

10.27.2.82 int ppl_Polyhedron_is_universe (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if ph is a universe polyhedron; returns 0 if it is not.

10.27.2.83 int ppl_Polyhedron_limited_BHRZ03_extrapolation_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*) [related]

If the polyhedron y is contained in (or equal to) the polyhedron x, assigns to x the *BHRZ03-widening* of x and y intersected with the constraints in cs that are satisfied by all the points of x.

10.27.2.84 int ppl_Polyhedron_limited_BHRZ03_extrapolation_assign_with_tokens (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*, unsigned * *tp*) [related]

If the polyhedron y is contained in (or equal to) the polyhedron x, assigns to x the *BHRZ03-widening* of x and y intersected with the constraints in cs that are satisfied by all the points of x. If tp is not the null pointer, the *widening with tokens* delay technique is applied with *tp available tokens.

10.27.2.85 int ppl_Polyhedron_limited_H79_extrapolation_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*) [related]

If the polyhedron y is contained in (or equal to) the polyhedron x, assigns to x the *H79-widening* of x and y intersected with the constraints in cs that are satisfied by all the points of x.

10.27.2.86 int ppl_Polyhedron_limited_H79_extrapolation_assign_with_tokens (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*, ppl_const_Constraint_System_t *cs*, unsigned * *tp*) [related]

If the polyhedron y is contained in (or equal to) the polyhedron x, assigns to x the *H79-widening* of x and y intersected with the constraints in cs that are satisfied by all the points of x. If tp is not the null pointer, the *widening with tokens* delay technique is applied with *tp available tokens.

10.27.2.87 int ppl_Polyhedron_map_space_dimensions (ppl_Polyhedron_t *ph*, ppl_dimension_type *maps*[ ], size_t *n*) [related]

Remaps the dimensions of the vector space according to a *partial function*. This function is specified by means of the maps array, which has n entries.

The partial function is defined on dimension i if i < n and maps[i] != ppl_not_a_dimension; otherwise it is undefined on dimension i. If the function is defined on dimension i, then dimension i is mapped onto dimension maps[i].

The result is undefined if maps does not encode a partial function with the properties described in the *specification of the mapping operator*.

10.27.2.88 int ppl_Polyhedron_maximize (ppl_const_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *le*, ppl_Coefficient_t *sup_n*, ppl_Coefficient_t *sup_d*, int * *pmaximum*) [related]

The same as ppl_Polyhedron_maximize_with_point, but without the output argument for the location where the supremum value is reached.

10.27.2.89 int ppl_Polyhedron_maximize_with_point (ppl_const_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *le*, ppl_Coefficient_t *sup_n*, ppl_Coefficient_t *sup_d*, int * *pmaximum*, ppl_Generator_t *point*) [related]

Returns a positive integer if ph is not empty and le is bounded from above in ph, in which case the supremum value and a point where le reaches it are computed.

Parameters

ph The polyhedron constraining `le`;

le The linear expression to be maximized subject to `ph`;

sup_n Will be assigned the numerator of the supremum value;

sup_d Will be assigned the denominator of the supremum value;

pmaximum Will store 1 in this location if the supremum is also the maximum, will store 0 otherwise;

point Will be assigned the point or closure point where `le` reaches the extremum value.

If `ph` is empty or `le` is not bounded from above, 0 will be returned and `sup_n`, `sup_d`, `*pmaximum` and `point` will be left untouched.

10.27.2.90 int ppl_Polyhedron_minimize_with_point (ppl_const_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *le*, ppl_Coefficient_t *inf_n*, ppl_Coefficient_t *inf_d*, int * *pminimum*) [related]

The same as ppl_Polyhedron_minimize_with_point, but without the output argument for the location where the infimum value is reached.

10.27.2.91 int ppl_Polyhedron_minimize_with_point (ppl_const_Polyhedron_t *ph*, ppl_const_Linear_Expression_t *le*, ppl_Coefficient_t *inf_n*, ppl_Coefficient_t *inf_d*, int * *pminimum*, ppl_Generator_t *point*) [related]

Returns a positive integer if `ph` is not empty and `le` is bounded from below in `ph`, in which case the infimum value and a point where `le` reaches it are computed.

Parameters

ph The polyhedron constraining `le`;

le The linear expression to be minimized subject to `ph`;

inf_n Will be assigned the numerator of the infimum value;

inf_d Will be assigned the denominator of the infimum value;

pminimum Will store 1 in this location if the infimum is also the minimum, will store 0 otherwise;

point Will be assigned the point or closure point where `le` reaches the extremum value.

If `ph` is empty or `le` is not bounded from below, 0 will be returned and `sup_n`, `sup_d`, `*pmaximum` and `point` will be left untouched.

10.27.2.92 int ppl_Polyhedron_OK (ppl_const_Polyhedron_t *ph*) [related]

Returns a positive integer if `ph` is well formed, i.e., if it satisfies all its implementation invariants; returns 0 and perhaps makes some noise if `ph` is broken. Useful for debugging purposes.

10.27.2.93 int ppl_Polyhedron_poly_difference_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Assigns to x the *poly-difference* of x and y.

10.27.2.94 int ppl_Polyhedron_poly_hull_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Assigns to x the poly-hull of x and y.

10.27.2.95 int ppl_Polyhedron_refine_with_congruence (ppl_Polyhedron_t *ph*, ppl_const_Congruence_t *c*) [related]

Refines ph using congruence c.

10.27.2.96 int ppl_Polyhedron_refine_with_congruences (ppl_Polyhedron_t *ph*, ppl_const_Congruence_System_t *cs*) [related]

Refines ph using the congruences in cs.

10.27.2.97 int ppl_Polyhedron_refine_with_constraint (ppl_Polyhedron_t *ph*, ppl_const_Constraint_t *c*) [related]

Refines ph using constraint c.

10.27.2.98 int ppl_Polyhedron_refine_with_constraints (ppl_Polyhedron_t *ph*, ppl_const_Constraint_System_t *cs*) [related]

Refines ph using the constraints in cs.

10.27.2.99 int ppl_Polyhedron_relation_with_Constraint (ppl_const_Polyhedron_t *ph*, ppl_const_Constraint_t *c*) [related]

Checks the relation between the polyhedron ph and the constraint c.

If successful, returns a non-negative integer that is obtained as the bitwise or of the bits (chosen among PPL_POLY_CON_RELATION_IS_DISJOINT PPL_POLY_CON_RELATION_STRICTLY_INTERSECTS, PPL_POLY_CON_RELATION_IS_INCLUDED, and PPL_POLY_CON_RELATION_SATURATES) that describe the relation between ph and c.

10.27.2.100 int ppl_Polyhedron_relation_with_Generator (ppl_const_Polyhedron_t *ph*, ppl_const_Generator_t *g*) [related]

Checks the relation between the polyhedron ph and the generator g.

If successful, returns a non-negative integer that is obtained as the bitwise or of the bits (only PPL_POLY_GEN_RELATION_SUBSUMES, at present) that describe the relation between ph and g.

10.27.2.101 int ppl_Polyhedron_remove_higher_space_dimensions (ppl_Polyhedron_t *ph*, ppl_dimension_type *d*) [related]

Removes the higher dimensions from the vector space enclosing ph so that, upon successful return, the new space dimension is d.

10.27.2.102 int ppl_Polyhedron_remove_space_dimensions (ppl_Polyhedron_t *ph*, ppl_dimension_type *ds*[ ], size_t *n*) [related]

Removes from the vector space enclosing ph the space dimensions that are specified in first n positions of the array ds. The presence of duplicates in ds is a waste but an innocuous one.

10.27.2.103 int ppl_Polyhedron_simplify_using_context_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Assigns to x the *meet-preserving simplification* of x with respect to context y. Returns a positive integer if x and y have a nonempty intersection; returns 0 if they are disjoint.

10.27.2.104 int ppl_Polyhedron_space_dimension (ppl_const_Polyhedron_t *ph*, ppl_dimension_type * *m*) [related]

Writes to m the dimension of the vector space enclosing ph.

10.27.2.105 int ppl_Polyhedron_strictly_contains_Polyhedron (ppl_const_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Returns a positive integer if x strictly contains y; returns 0 if it does not.

10.27.2.106 int ppl_Polyhedron_time_elapse_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Assigns to x the *time-elapse* between the polyhedra x and y.

10.27.2.107 int ppl_Polyhedron_topological_closure_assign (ppl_Polyhedron_t *ph*) [related]

Assigns to `ph` its topological closure.

10.27.2.108 int ppl_Polyhedron_total_memory_in_bytes (ppl_const_Polyhedron_t *ph*, size_t * *sz*) [related]

Writes to `sz` a lower bound to the size in bytes of the memory managed by `ph`.

10.27.2.109 int ppl_Polyhedron_unconstrain_space_dimension (ppl_Polyhedron_t *ph*, ppl_dimension_type *var*) [related]

Modifies `ph` by *unconstraining* the space dimension `var`.

10.27.2.110 int ppl_Polyhedron_unconstrain_space_dimensions (ppl_Polyhedron_t *ph*, ppl_dimension_type *ds*[ ], size_t *n*) [related]

Modifies `ph` by *unconstraining* the space dimensions that are specified in the first `n` positions of the array `ds`. The presence of duplicates in `ds` is a waste but an innocuous one.

10.27.2.111 int ppl_Polyhedron_upper_bound_assign (ppl_Polyhedron_t *x*, ppl_const_Polyhedron_t *y*) [related]

Assigns to `x` an upper bound of `x` and `y`.

For the domain of polyhedra, this is the same as `ppl_Polyhedron_poly_hull_assign(x, y)`.

10.27.2.112 int wrap_assign (ppl_Polyhedron_t *ph*, ppl_dimension_type *ds*[ ], size_t *n*, ppl_enum_Bounded_Integer_Type_Width *w*, ppl_enum_Bounded_Integer_Type_Representation *r*, ppl_enum_Bounded_Integer_Type_Overflow *o*, const ppl_const_Constraint_System_t * *pcs*, unsigned *complexity_threshold*, int *wrap_individually*) [related]

Assigns to `ph` the polyhedron obtained from `ph` by "wrapping" the vector space defined by the first `n` space dimensions in `ds`[].

Parameters

ph The polyhedron that is transformed;

ds[ ] Specifies the space dimensions to be wrapped.

n The first `n` space dimensions in the array `ds`[] will be wrapped.

w The width of the bounded integer type corresponding to all the dimensions to be wrapped.

r The representation of the bounded integer type corresponding to all the dimensions to be wrapped.

o The overflow behavior of the bounded integer type corresponding to all the dimensions to be wrapped.

pcs Possibly null pointer to a constraint system whose space dimensions are the first `n` dimensions in `ds`[]. If `*pcs` depends on variables not in `vars`, the behavior is undefined. When non-null, the constraint system is assumed to represent the conditional or looping construct guard with respect to which wrapping is performed. Since wrapping requires the computation of upper bounds and due to non-distributivity of constraint refinement over upper bounds, passing a constraint system in this way can be more precise than refining the result of the wrapping operation with the constraints in `cs`.

complexity_threshold A precision parameter where higher values result in possibly improved precision.

wrap_individually Non-zero if the dimensions should be wrapped individually (something that results in much greater efficiency to the detriment of precision).

The documentation for this interface was generated from the following file:

- C_interface.dox

10.28 Parma_Polyhedra_Library::Interfaces::C::timeout_exception Class Reference

`#include <ppl_c_implementation_common.defs.hh>`

Public Member Functions

- void throw_me () const
- int priority () const

10.28.1 Detailed Description

Definition at line 106 of file ppl_c_implementation_common.defs.hh.

10.28.2 Member Function Documentation

10.28.2.1 int Parma_Polyhedra_Library::Interfaces::C::timeout_exception::priority () const [inline]

Definition at line 111 of file ppl_c_implementation_common.defs.hh.

10.28.2.2 void Parma_Polyhedra_Library::Interfaces::C::timeout_exception::throw_me () const [inline]

Definition at line 108 of file ppl_c_implementation_common.defs.hh.

The documentation for this class was generated from the following file:

- ppl_c_implementation_common.defs.hh

11 File Documentation

11.1 C_interface.dox File Reference

Typedefs

- typedef struct ppl_Polyhedron_tag * ppl_Polyhedron_t

  Opaque pointer.

- typedef struct ppl_Polyhedron_tag const * ppl_const_Polyhedron_t

  Opaque pointer to const object.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_tag * ppl_Pointset_Powerset_C_Polyhedron_t

  Opaque pointer.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_tag const * ppl_const_Pointset_Powerset_C_Polyhedron_t

  Opaque pointer to const object.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_iterator_tag * ppl_Pointset_Powerset_C_Polyhedron_iterator_t

  Opaque pointer.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_iterator_tag const * ppl_const_Pointset_Powerset_C_Polyhedron_iterator_t

  Opaque pointer to const object.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag * ppl_Pointset_Powerset_C_Polyhedron_const_iterator_t

  Opaque pointer.

- typedef struct ppl_Pointset_Powerset_C_Polyhedron_const_iterator_tag const * ppl_const_Pointset_Powerset_C_Polyhedron_const_iterator_t

  Opaque pointer to const object.

Functions

Functions that Do Not Modify the Polyhedron

- int ppl_Polyhedron_relation_with_Congruence (ppl_const_Polyhedron_t ph, ppl_const_Congruence_t c)

11.1.1 Function Documentation

11.1.1.1 int ppl_Polyhedron_relation_with_Congruence (ppl_const_Polyhedron_t *ph*, ppl_const_Congruence_t *c*)

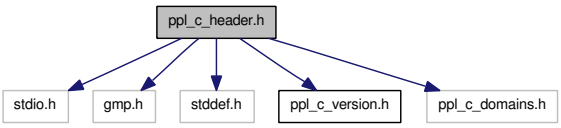
11.2 fdl.dox File Reference

11.3 gpl.dox File Reference

11.4 ppl_c_header.h File Reference

```
#include <stdio.h>
#include <gmp.h>
#include <stddef.h>
#include "ppl_c_version.h"
#include "ppl_c_domains.h"
```

Include dependency graph for ppl_c_header.h:



Defines

- #define PPL_PROTO(protos) ()
- #define PPL_TYPE_DECLARATION(Type)
- #define PPL_DECLARE_PRINT_FUNCTIONS(Type)
- #define PPL_DECLARE_ASCII_DUMP_LOAD_FUNCTIONS(Type)
- #define PPL_DECLARE_IO_FUNCTIONS(Type)
- #define PPL_DECLARE_AND_DOCUMENT_PRINT_FUNCTIONS(Type)
- #define PPL_DECLARE_AND_DOCUMENT_ASCII_DUMP_LOAD_FUNCTIONS(Type)
- #define PPL_DECLARE_AND_DOCUMENT_IO_FUNCTIONS(Type)

Typedefs

- typedef size_t ppl_dimension_type

  An unsigned integral type for representing space dimensions.

- typedef const char * ppl_io_variable_output_function_type (ppl_dimension_type var)

  The type of output functions used for printing variables.

Enumerations

- enum ppl_enum_error_code {

  PPL_ERROR_OUT_OF_MEMORY, PPL_ERROR_INVALID_ARGUMENT, PPL_ERROR_-DOMAIN_ERROR, PPL_ERROR_LENGTH_ERROR,

  PPL_ARITHMETIC_OVERFLOW, PPL_STDIO_ERROR, PPL_ERROR_INTERNAL_ERROR, PPL_ERROR_UNKNOWN_STANDARD_EXCEPTION,

  PPL_ERROR_UNEXPECTED_ERROR, PPL_TIMEOUT_EXCEPTION, PPL_ERROR_LOGIC_-ERROR }

  Defines the error codes that any function may return.

- enum ppl_enum_Constraint_Type {

  PPL_CONSTRAINT_TYPE_LESS_THAN, PPL_CONSTRAINT_TYPE_LESS_OR_EQUAL, PPL_CONSTRAINT_TYPE_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_OR_EQUAL,

  PPL_CONSTRAINT_TYPE_GREATER_THAN }

  Describes the relations represented by a constraint.

- enum ppl_enum_Generator_Type { PPL_GENERATOR_TYPE_LINE, PPL_GENERATOR_-TYPE_RAY, PPL_GENERATOR_TYPE_POINT, PPL_GENERATOR_TYPE_CLOSURE_-POINT }

  Describes the different kinds of generators.

- enum ppl_enum_Grid_Generator_Type { PPL_GRID_GENERATOR_TYPE_LINE, PPL_GRID_-GENERATOR_TYPE_PARAMETER, PPL_GRID_GENERATOR_TYPE_POINT }

  Describes the different kinds of grid generators.

- enum ppl_enum_Bounded_Integer_Type_Width {

  PPL_BITS_8, PPL_BITS_16, PPL_BITS_32, PPL_BITS_64,

  PPL_BITS_128 }

  Widths of bounded integer types.

- enum ppl_enum_Bounded_Integer_Type_Representation { PPL_UNSIGNED, PPL_SIGNED_2_-COMPLEMENT }

  Representation of bounded integer types.

- enum ppl_enum_Bounded_Integer_Type_Overflow { PPL_OVERFLOW_WRAPS, PPL_-OVERFLOW_UNDEFINED, PPL_OVERFLOW_IMPOSSIBLE }

  Overflow behavior of bounded integer types.

Functions

- int ppl_initialize (void)

  Initializes the Parma Polyhedra Library. This function must be called before any other function.

- int ppl_finalize (void)

  Finalizes the Parma Polyhedra Library. This function must be called after any other function.

- int ppl_set_rounding_for_PPL (void)

Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly.

- int ppl_restore_pre_PPL_rounding (void)
  Sets the FPU rounding mode as it was before initialization of the PPL.
- int ppl_irrational_precision (unsigned *p)
  Writes to `p` *the precision parameter used for irrational calculations.*
- int ppl_set_irrational_precision (unsigned p)
  Sets the precision parameter used for irrational calculations.
- int ppl_version_major (void)
  Returns the major number of the PPL version.
- int ppl_version_minor (void)
  Returns the minor number of the PPL version.
- int ppl_version_revision (void)
  Returns the revision number of the PPL version.
- int ppl_version_beta (void)
  Returns the beta number of the PPL version.
- int ppl_version (const char **p)
  Writes to `*p` *a pointer to a character string containing the PPL version.*
- int ppl_banner (const char **p)
  Writes to `*p` *a pointer to a character string containing the PPL banner.*
- int ppl_set_error_handler (void(*h)(enum ppl_enum_error_code code, const char *description))
  Installs the user-defined error handler pointed at by `h`.
- int ppl_set_timeout (unsigned time)
  Sets the timeout for computations whose completion could require an exponential amount of time.
- int ppl_reset_timeout (void)
  Resets the timeout time so that the computation is not interrupted.
- int ppl_set_deterministic_timeout (unsigned weight)
  Sets a threshold for computations whose completion could require an exponential amount of time.
- int ppl_reset_deterministic_timeout (void)
  Resets the deterministic timeout so that the computation is not interrupted.
- int ppl_max_space_dimension (ppl_dimension_type *m)
  Writes to `m` *the maximum space dimension this library can handle.*
- int ppl_not_a_dimension (ppl_dimension_type *m)
  Writes to `m` *a value that does not designate a valid dimension.*

- int ppl_io_print_variable (ppl_dimension_type var)
  Pretty-prints `var` to `stdout`.
- int ppl_io_fprint_variable (FILE *stream, ppl_dimension_type var)
  Pretty-prints `var` to the given output `stream`.
- int ppl_io_asprint_variable (char **strp, ppl_dimension_type var)
  Pretty-prints `var` to a malloc-allocated string, a pointer to which is returned via `strp`.
- int ppl_io_set_variable_output_function (ppl_io_variable_output_function_type *p)
  Sets the output function to be used for printing variables to `p`.
- int ppl_io_get_variable_output_function (ppl_io_variable_output_function_type **pp)
  Writes a pointer to the current variable output function to `pp`.
- char * ppl_io_wrap_string (const char *src, unsigned indent_depth, unsigned preferred_first_line_length, unsigned preferred_line_length)
  Utility function for the wrapping of lines of text.

Constructors, Assignment and Destructor

- int ppl_new_Generator_System_zero_dim_univ (ppl_Generator_System_t *pgs)
- int ppl_new_Grid_Generator_System_zero_dim_univ (ppl_Grid_Generator_System_t *pgs)

Variables

- unsigned int PPL_COMPLEXITY_CLASS_POLYNOMIAL
  Code of the worst-case polynomial complexity class.
- unsigned int PPL_COMPLEXITY_CLASS_SIMPLEX
  Code of the worst-case exponential but typically polynomial complexity class.
- unsigned int PPL_COMPLEXITY_CLASS_ANY
  Code of the universal complexity class.
- unsigned int PPL_POLY_CON_RELATION_IS_DISJOINT
  Individual bit saying that the polyhedron and the set of points satisfying the constraint are disjoint.
- unsigned int PPL_POLY_CON_RELATION_STRICTLY_INTERSECTS
  Individual bit saying that the polyhedron intersects the set of points satisfying the constraint, but it is not included in it.
- unsigned int PPL_POLY_CON_RELATION_IS_INCLUDED
  Individual bit saying that the polyhedron is included in the set of points satisfying the constraint.
- unsigned int PPL_POLY_CON_RELATION_SATURATES
  Individual bit saying that the polyhedron is included in the set of points saturating the constraint.
- unsigned int PPL_POLY_GEN_RELATION_SUBSUMES
  Individual bit saying that adding the generator would not change the polyhedron.

11.4.1 Define Documentation

11.4.1.1 #define PPL_DECLARE_AND_DOCUMENT_ASCII_DUMP_LOAD_-FUNCTIONS(Type)

Definition at line 794 of file ppl_c_header.h.

11.4.1.2 #define PPL_DECLARE_AND_DOCUMENT_IO_FUNCTIONS(Type)

Value:

```
              \                                                   \
PPL_DECLARE_AND_DOCUMENT_PRINT_FUNCTIONS(Type)           \
PPL_DECLARE_AND_DOCUMENT_ASCII_DUMP_LOAD_FUNCTIONS(Type) \
```

Definition at line 804 of file ppl_c_header.h.

11.4.1.3 #define PPL_DECLARE_AND_DOCUMENT_PRINT_FUNCTIONS(Type)

Definition at line 782 of file ppl_c_header.h.

11.4.1.4 #define PPL_DECLARE_ASCII_DUMP_LOAD_FUNCTIONS(Type)

Definition at line 768 of file ppl_c_header.h.

11.4.1.5 #define PPL_DECLARE_IO_FUNCTIONS(Type)

Value:

```
PPL_DECLARE_PRINT_FUNCTIONS(Type)           \
PPL_DECLARE_ASCII_DUMP_LOAD_FUNCTIONS(Type)
```

Definition at line 778 of file ppl_c_header.h.

11.4.1.6 #define PPL_DECLARE_PRINT_FUNCTIONS(Type)

Definition at line 757 of file ppl_c_header.h.

11.4.1.7 #define PPL_PROTO(protos) ()

Definition at line 162 of file ppl_c_header.h.

11.4.1.8 #define PPL_TYPE_DECLARATION(Type)

Value:

```
                          \
typedef struct ppl_##Type##_tag* ppl_##Type##_t;                        \       \
typedef struct ppl_##Type##_tag const* ppl_const_##Type##_t;
```

Definition at line 539 of file ppl_c_header.h.

11.4.2 Function Documentation

11.4.2.1 int ppl_new_Generator_System_zero_dim_univ (ppl_Generator_System_t * *pgs*)

Definition at line 1097 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.4.2.2 int ppl_new_Grid_Generator_System_zero_dim_univ (ppl_Grid_Generator_System_t * *pgs*)

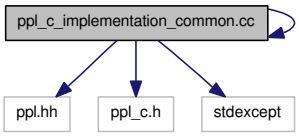
Definition at line 1690 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

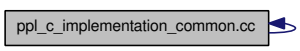
11.5 ppl_c_implementation_common.cc File Reference

```
#include "ppl_c_implementation_common.defs.hh"
#include "ppl.hh"
#include "ppl_c.h"
#include <stdexcept>
```

Include dependency graph for ppl_c_implementation_common.cc:



This graph shows which files directly or indirectly include this file:



Namespaces

- namespace Parma_Polyhedra_Library

- namespace Parma_Polyhedra_Library::Interfaces
- namespace Parma_Polyhedra_Library::Interfaces::C

Defines

- #define FORMAT "%u"
- #define CONVERSION (unsigned)

Typedefs

- typedef const char * Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function_type (ppl_dimension_type var)

Functions

- const char * Parma_Polyhedra_Library::Interfaces::C::c_variable_default_output_function (ppl_dimension_type var)
- void Parma_Polyhedra_Library::Interfaces::C::cxx_Variable_output_function (std::ostream &s, const Variable &v)
- void Parma_Polyhedra_Library::Interfaces::C::notify_error (enum ppl_enum_error_code code, const char *description)
- void Parma_Polyhedra_Library::Interfaces::C::reset_timeout ()
- void Parma_Polyhedra_Library::Interfaces::C::reset_deterministic_timeout ()
- int ppl_set_error_handler (error_handler_type h)
- int ppl_initialize (void)

  Initializes the Parma Polyhedra Library. This function must be called before any other function.

- catch (const std::invalid_argument &e)
- catch (const std::domain_error &e)
- catch (const std::length_error &e)
- catch (const std::logic_error &e)
- catch (const std::overflow_error &e)
- catch (const std::runtime_error &e)
- catch (const std::exception &e)
- catch (timeout_exception &)
- catch (deterministic_timeout_exception &)
- catch (...)
- int ppl_finalize (void)

  Finalizes the Parma Polyhedra Library. This function must be called after any other function.

- int ppl_set_timeout (unsigned time)

  Sets the timeout for computations whose completion could require an exponential amount of time.

- int ppl_reset_timeout (void)

  Resets the timeout time so that the computation is not interrupted.

- int ppl_set_deterministic_timeout (unsigned weight)

  Sets a threshold for computations whose completion could require an exponential amount of time.

- int ppl_reset_deterministic_timeout (void)

  Resets the deterministic timeout so that the computation is not interrupted.

- int ppl_set_rounding_for_PPL (void)

  Sets the FPU rounding mode so that the PPL abstractions based on floating point numbers work correctly.

- int ppl_restore_pre_PPL_rounding (void)

  Sets the FPU rounding mode as it was before initialization of the PPL.

- int ppl_irrational_precision (unsigned *p)

  Writes to `p` *the precision parameter used for irrational calculations.*

- int ppl_set_irrational_precision (unsigned p)

  Sets the precision parameter used for irrational calculations.

- int ppl_version_major (void)

  Returns the major number of the PPL version.

- int ppl_version_minor (void)

  Returns the minor number of the PPL version.

- int ppl_version_revision (void)

  Returns the revision number of the PPL version.

- int ppl_version_beta (void)

  Returns the beta number of the PPL version.

- int ppl_version (const char **p)

  Writes to `*p` *a pointer to a character string containing the PPL version.*

- int ppl_banner (const char **p)

  Writes to `*p` *a pointer to a character string containing the PPL banner.*

- int ppl_max_space_dimension (ppl_dimension_type *m)

  Writes to `m` *the maximum space dimension this library can handle.*

- int ppl_not_a_dimension (ppl_dimension_type *m)

  Writes to `m` *a value that does not designate a valid dimension.*

- int ppl_new_Coefficient (ppl_Coefficient_t *pc)
- int ppl_new_Coefficient_from_mpz_t (ppl_Coefficient_t *pc, mpz_t z)
- int ppl_new_Coefficient_from_Coefficient (ppl_Coefficient_t *pc, ppl_const_Coefficient_t c)
- int ppl_Coefficient_to_mpz_t (ppl_const_Coefficient_t c, mpz_t z)
- int ppl_delete_Coefficient (ppl_const_Coefficient_t c)
- int ppl_assign_Coefficient_from_mpz_t (ppl_Coefficient_t dst, mpz_t z)
- int ppl_assign_Coefficient_from_Coefficient (ppl_Coefficient_t dst, ppl_const_Coefficient_t src)
- int ppl_Coefficient_OK (ppl_const_Coefficient_t)
- int ppl_Coefficient_is_bounded (void)
- int ppl_Coefficient_min (mpz_t min)
- int ppl_Coefficient_max (mpz_t max)

- int ppl_Constraint_System_space_dimension (ppl_const_Constraint_System_t cs, ppl_dimension_type *m)
- int ppl_Constraint_System_empty (ppl_const_Constraint_System_t cs)
- int ppl_Constraint_System_has_strict_inequalities (ppl_const_Constraint_System_t cs)
- int ppl_Constraint_System_clear (ppl_Constraint_System_t cs)
- int ppl_Constraint_System_insert_Constraint (ppl_Constraint_System_t cs, ppl_const_Constraint_t c)
- int ppl_Constraint_System_OK (ppl_const_Constraint_System_t cs)
- int ppl_new_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t *pcit)
- int ppl_new_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t *pcit, ppl_const_Constraint_System_const_iterator_t cit)
- int ppl_delete_Constraint_System_const_iterator (ppl_const_Constraint_System_const_iterator_t cit)
- int ppl_assign_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t dst, ppl_const_Constraint_System_const_iterator_t src)
- int ppl_Constraint_System_begin (ppl_const_Constraint_System_t cs, ppl_Constraint_System_const_iterator_t cit)
- int ppl_Constraint_System_end (ppl_const_Constraint_System_t cs, ppl_Constraint_System_const_iterator_t cit)
- int ppl_Constraint_System_const_iterator_dereference (ppl_const_Constraint_System_const_iterator_t cit, ppl_const_Constraint_t *pc)
- int ppl_Constraint_System_const_iterator_increment (ppl_Constraint_System_const_iterator_t cit)
- int ppl_Constraint_System_const_iterator_equal_test (ppl_const_Constraint_System_const_iterator_t x, ppl_const_Constraint_System_const_iterator_t y)
- int ppl_new_Generator (ppl_Generator_t *pg, ppl_const_Linear_Expression_t le, enum ppl_enum_Generator_Type t, ppl_const_Coefficient_t d)
- int ppl_new_Generator_zero_dim_point (ppl_Generator_t *pg)
- int ppl_new_Generator_zero_dim_closure_point (ppl_Generator_t *pg)
- int ppl_new_Generator_from_Generator (ppl_Generator_t *pg, ppl_const_Generator_t g)
- int ppl_delete_Generator (ppl_const_Generator_t le)
- int ppl_assign_Generator_from_Generator (ppl_Generator_t dst, ppl_const_Generator_t src)
- int ppl_Generator_space_dimension (ppl_const_Generator_t g, ppl_dimension_type *m)
- int ppl_Generator_type (ppl_const_Generator_t g)
- int ppl_Generator_coefficient (ppl_const_Generator_t g, ppl_dimension_type var, ppl_Coefficient_t n)
- int ppl_Generator_divisor (ppl_const_Generator_t g, ppl_Coefficient_t n)
- int ppl_Generator_OK (ppl_const_Generator_t g)
- int ppl_new_Linear_Expression_from_Generator (ppl_Linear_Expression_t *ple, ppl_const_Generator_t g)
- int ppl_new_Generator_System (ppl_Generator_System_t *pgs)
- int ppl_new_Generator_System_zero_dim_univ (ppl_Generator_System_t *pgs)
- int ppl_new_Generator_System_from_Generator (ppl_Generator_System_t *pgs, ppl_const_Generator_t g)
- int ppl_new_Generator_System_from_Generator_System (ppl_Generator_System_t *pgs, ppl_const_Generator_System_t gs)
- int ppl_delete_Generator_System (ppl_const_Generator_System_t gs)
- int ppl_assign_Generator_System_from_Generator_System (ppl_Generator_System_t dst, ppl_const_Generator_System_t src)
- int ppl_Generator_System_space_dimension (ppl_const_Generator_System_t gs, ppl_dimension_type *m)
- int ppl_Generator_System_empty (ppl_const_Generator_System_t gs)

- int ppl_new_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t *pcit)
- int ppl_new_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t *pcit, ppl_const_Congruence_System_const_iterator_t cit)
- int ppl_delete_Congruence_System_const_iterator (ppl_const_Congruence_System_const_iterator_t cit)
- int ppl_assign_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t dst, ppl_const_Congruence_System_const_iterator_t src)
- int ppl_Congruence_System_begin (ppl_const_Congruence_System_t cs, ppl_Congruence_System_const_iterator_t cit)
- int ppl_Congruence_System_end (ppl_const_Congruence_System_t cs, ppl_Congruence_System_const_iterator_t cit)
- int ppl_Congruence_System_const_iterator_dereference (ppl_const_Congruence_System_const_iterator_t cit, ppl_const_Congruence_t *pc)
- int ppl_Congruence_System_const_iterator_increment (ppl_Congruence_System_const_iterator_t cit)
- int ppl_Congruence_System_const_iterator_equal_test (ppl_const_Congruence_System_const_iterator_t x, ppl_const_Congruence_System_const_iterator_t y)
- int ppl_new_Grid_Generator (ppl_Grid_Generator_t *pg, ppl_const_Linear_Expression_t le, enum ppl_enum_Grid_Generator_Type t, ppl_const_Coefficient_t d)
- int ppl_new_Grid_Generator_zero_dim_point (ppl_Grid_Generator_t *pg)
- int ppl_new_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t *pg, ppl_const_Grid_Generator_t g)
- int ppl_delete_Grid_Generator (ppl_const_Grid_Generator_t le)
- int ppl_assign_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t dst, ppl_const_Grid_Generator_t src)
- int ppl_Grid_Generator_space_dimension (ppl_const_Grid_Generator_t g, ppl_dimension_type *m)
- int ppl_Grid_Generator_type (ppl_const_Grid_Generator_t g)
- int ppl_Grid_Generator_coefficient (ppl_const_Grid_Generator_t g, ppl_dimension_type var, ppl_Coefficient_t n)
- int ppl_Grid_Generator_divisor (ppl_const_Grid_Generator_t g, ppl_Coefficient_t n)
- int ppl_Grid_Generator_OK (ppl_const_Grid_Generator_t g)
- int ppl_new_Grid_Generator_System (ppl_Grid_Generator_System_t *pgs)
- int ppl_new_Grid_Generator_System_zero_dim_univ (ppl_Grid_Generator_System_t *pgs)
- int ppl_new_Grid_Generator_System_from_Grid_Generator (ppl_Grid_Generator_System_t *pgs, ppl_const_Grid_Generator_t g)
- int ppl_new_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_System_t *pgs, ppl_const_Grid_Generator_System_t gs)
- int ppl_delete_Grid_Generator_System (ppl_const_Grid_Generator_System_t gs)
- int ppl_assign_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_System_t dst, ppl_const_Grid_Generator_System_t src)
- int ppl_Grid_Generator_System_space_dimension (ppl_const_Grid_Generator_System_t gs, ppl_dimension_type *m)
- int ppl_Grid_Generator_System_empty (ppl_const_Grid_Generator_System_t gs)
- int ppl_Grid_Generator_System_clear (ppl_Grid_Generator_System_t gs)
- int ppl_Grid_Generator_System_insert_Grid_Generator (ppl_Grid_Generator_System_t gs, ppl_const_Grid_Generator_t g)
- int ppl_Grid_Generator_System_OK (ppl_const_Grid_Generator_System_t gs)
- int ppl_new_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_const_iterator_t *pgit)

- int ppl_MIP_Problem_evaluate_objective_function (ppl_const_MIP_Problem_t mip, ppl_const_Generator_t g, ppl_Coefficient_t num, ppl_Coefficient_t den)
- int ppl_MIP_Problem_feasible_point (ppl_const_MIP_Problem_t mip, ppl_const_Generator_t *pg)
- int ppl_MIP_Problem_optimizing_point (ppl_const_MIP_Problem_t mip, ppl_const_Generator_t *pg)
- int ppl_MIP_Problem_optimal_value (ppl_const_MIP_Problem_t mip, ppl_Coefficient_t num, ppl_Coefficient_t den)
- int ppl_MIP_Problem_get_control_parameter (ppl_const_MIP_Problem_t mip, int name)
- int ppl_MIP_Problem_set_control_parameter (ppl_MIP_Problem_t mip, int value)
- int ppl_MIP_Problem_OK (ppl_const_MIP_Problem_t mip)
- int ppl_MIP_Problem_total_memory_in_bytes (ppl_const_MIP_Problem_t mip, size_t *sz)
- int ppl_MIP_Problem_external_memory_in_bytes (ppl_const_MIP_Problem_t mip, size_t *sz)
- int ppl_new_PIP_Problem_from_space_dimension (ppl_PIP_Problem_t *ppip, ppl_dimension_type d)
- int ppl_new_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t *dpip, ppl_const_PIP_Problem_t pip)
- int ppl_new_PIP_Problem_from_constraints (ppl_PIP_Problem_t *ppip, ppl_dimension_type d, ppl_Constraint_System_const_iterator_t first, ppl_Constraint_System_const_iterator_t last, size_t n, ppl_dimension_type ds[ ])
- int ppl_assign_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t dst, ppl_const_PIP_Problem_t src)
- int ppl_delete_PIP_Problem (ppl_const_PIP_Problem_t pip)
- int ppl_PIP_Problem_space_dimension (ppl_const_PIP_Problem_t pip, ppl_dimension_type *m)
- int ppl_PIP_Problem_number_of_parameter_space_dimensions (ppl_const_PIP_Problem_t pip, ppl_dimension_type *m)
- int ppl_PIP_Problem_parameter_space_dimensions (ppl_const_PIP_Problem_t pip, ppl_dimension_type ds[ ])
- int ppl_PIP_Problem_number_of_constraints (ppl_const_PIP_Problem_t pip, ppl_dimension_type *m)
- int ppl_PIP_Problem_constraint_at_index (ppl_const_PIP_Problem_t pip, ppl_dimension_type i, ppl_const_Constraint_t *pc)
- int ppl_PIP_Problem_clear (ppl_PIP_Problem_t pip)
- int ppl_PIP_Problem_add_space_dimensions_and_embed (ppl_PIP_Problem_t pip, ppl_dimension_type pip_vars, ppl_dimension_type pip_params)
- int ppl_PIP_Problem_add_to_parameter_space_dimensions (ppl_PIP_Problem_t pip, ppl_dimension_type ds[ ], size_t n)
- int ppl_PIP_Problem_add_constraint (ppl_PIP_Problem_t pip, ppl_const_Constraint_t c)
- int ppl_PIP_Problem_add_constraints (ppl_PIP_Problem_t pip, ppl_const_Constraint_System_t cs)
- int ppl_PIP_Problem_is_satisfiable (ppl_const_PIP_Problem_t pip)
- int ppl_PIP_Problem_solve (ppl_const_PIP_Problem_t pip)
- int ppl_PIP_Problem_solution (ppl_const_PIP_Problem_t pip, ppl_const_PIP_Tree_Node_t *ppip_tree)
- int ppl_PIP_Problem_optimizing_solution (ppl_const_PIP_Problem_t pip, ppl_const_PIP_Tree_Node_t *ppip_tree)
- int ppl_PIP_Problem_OK (ppl_const_PIP_Problem_t pip)
- int ppl_PIP_Problem_get_control_parameter (ppl_const_PIP_Problem_t pip, int name)
- int ppl_PIP_Problem_set_control_parameter (ppl_PIP_Problem_t pip, int value)
- int ppl_PIP_Problem_get_big_parameter_dimension (ppl_const_PIP_Problem_t pip, ppl_dimension_type *pd)
- int ppl_PIP_Problem_set_big_parameter_dimension (ppl_PIP_Problem_t pip, ppl_dimension_type d)

- int ppl_PIP_Problem_total_memory_in_bytes (ppl_const_PIP_Problem_t pip, size_t *sz)
- int ppl_PIP_Problem_external_memory_in_bytes (ppl_const_PIP_Problem_t pip, size_t *sz)
- int ppl_PIP_Tree_Node_as_solution (ppl_const_PIP_Tree_Node_t spip_tree, ppl_const_PIP_Solution_Node_t *dpip_tree)
- int ppl_PIP_Tree_Node_as_decision (ppl_const_PIP_Tree_Node_t spip_tree, ppl_const_PIP_Decision_Node_t *dpip_tree)
- int ppl_PIP_Tree_Node_get_constraints (ppl_const_PIP_Tree_Node_t pip_tree, ppl_const_Constraint_System_t *pcs)
- int ppl_PIP_Tree_Node_OK (ppl_const_PIP_Tree_Node_t pip_tree)
- int ppl_PIP_Tree_Node_number_of_artificials (ppl_const_PIP_Tree_Node_t pip_tree, ppl_dimension_type *m)
- int ppl_PIP_Tree_Node_begin (ppl_const_PIP_Tree_Node_t pip_tree, ppl_Artificial_Parameter_Sequence_const_iterator_t pit)
- int ppl_PIP_Tree_Node_end (ppl_const_PIP_Tree_Node_t pip_tree, ppl_Artificial_Parameter_Sequence_const_iterator_t pit)
- int ppl_PIP_Solution_Node_get_parametric_values (ppl_const_PIP_Solution_Node_t pip_sol, ppl_dimension_type var, ppl_const_Linear_Expression_t *le)
- int ppl_PIP_Solution_Node_OK (ppl_const_PIP_Solution_Node_t pip_sol)
- int ppl_PIP_Decision_Node_OK (ppl_const_PIP_Decision_Node_t pip_dec)
- int ppl_PIP_Decision_Node_get_child_node (ppl_const_PIP_Decision_Node_t pip_dec, int b, ppl_const_PIP_Tree_Node_t *pip_tree)
- int ppl_Artificial_Parameter_get_Linear_Expression (ppl_const_Artificial_Parameter_t ap, ppl_Linear_Expression_t le)
- int ppl_Artificial_Parameter_coefficient (ppl_const_Artificial_Parameter_t ap, ppl_dimension_type var, ppl_Coefficient_t n)
- int ppl_Artificial_Parameter_inhomogeneous_term (ppl_const_Artificial_Parameter_t ap, ppl_Coefficient_t n)
- int ppl_Artificial_Parameter_denominator (ppl_const_Artificial_Parameter_t ap, ppl_Coefficient_t n)
- int ppl_new_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t *papit)
- int ppl_new_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t *papit, ppl_const_Artificial_Parameter_Sequence_const_iterator_t apit)
- int ppl_delete_Artificial_Parameter_Sequence_const_iterator (ppl_const_Artificial_Parameter_Sequence_const_iterator_t apit)
- int ppl_assign_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t dst, ppl_const_Artificial_Parameter_Sequence_const_iterator_t src)
- int ppl_Artificial_Parameter_Sequence_const_iterator_dereference (ppl_const_Artificial_Parameter_Sequence_const_iterator_t apit, ppl_const_Artificial_Parameter_t *pap)
- int ppl_Artificial_Parameter_Sequence_const_iterator_increment (ppl_Artificial_Parameter_Sequence_const_iterator_t apit)
- int ppl_Artificial_Parameter_Sequence_const_iterator_equal_test (ppl_const_Artificial_Parameter_Sequence_const_iterator_t x, ppl_const_Artificial_Parameter_Sequence_const_iterator_t y)
- int ppl_io_print_variable (ppl_dimension_type var)

  Pretty-prints `var` *to* `stdout`.

- int ppl_io_fprint_variable (FILE *stream, ppl_dimension_type var)

  Pretty-prints `var` *to the given output* `stream`.

- int ppl_io_asprint_variable (char **strp, ppl_dimension_type var)

  Pretty-prints `var` to a malloc-allocated string, a pointer to which is returned via `strp`.

- char * ppl_io_wrap_string (const char *src, unsigned indent_depth, unsigned preferred_first_line_length, unsigned preferred_line_length)

  Utility function for the wrapping of lines of text.

- int ppl_io_set_variable_output_function (ppl_io_variable_output_function_type *p)

  Sets the output function to be used for printing variables to `p`.

- int ppl_io_get_variable_output_function (ppl_io_variable_output_function_type **pp)

  Writes a pointer to the current variable output function to `pp`.

Variables

- error_handler_type Parma_Polyhedra_Library::Interfaces::C::user_error_handler = 0
- ppl_io_variable_output_function_type * Parma_Polyhedra_Library::Interfaces::C::c_variable_output_function
- Variable::output_function_type * Parma_Polyhedra_Library::Interfaces::C::saved_cxx_Variable_output_function
- unsigned int PPL_POLY_CON_RELATION_IS_DISJOINT

  Individual bit saying that the polyhedron and the set of points satisfying the constraint are disjoint.

- unsigned int PPL_POLY_CON_RELATION_STRICTLY_INTERSECTS

  Individual bit saying that the polyhedron intersects the set of points satisfying the constraint, but it is not included in it.

- unsigned int PPL_POLY_CON_RELATION_IS_INCLUDED

  Individual bit saying that the polyhedron is included in the set of points satisfying the constraint.

- unsigned int PPL_POLY_CON_RELATION_SATURATES

  Individual bit saying that the polyhedron is included in the set of points saturating the constraint.

- unsigned int PPL_POLY_GEN_RELATION_SUBSUMES

  Individual bit saying that adding the generator would not change the polyhedron.

- unsigned int PPL_COMPLEXITY_CLASS_POLYNOMIAL

  Code of the worst-case polynomial complexity class.

- unsigned int PPL_COMPLEXITY_CLASS_SIMPLEX

  Code of the worst-case exponential but typically polynomial complexity class.

- unsigned int PPL_COMPLEXITY_CLASS_ANY

  Code of the universal complexity class.

- int PPL_MIP_PROBLEM_STATUS_UNFEASIBLE
- int PPL_MIP_PROBLEM_STATUS_UNBOUNDED
- int PPL_MIP_PROBLEM_STATUS_OPTIMIZED
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_NAME_PRICING

- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_FLOAT
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_EXACT
- int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_TEXTBOOK
- int PPL_PIP_PROBLEM_STATUS_UNFEASIBLE
- int PPL_PIP_PROBLEM_STATUS_OPTIMIZED
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_CUTTING_STRATEGY
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_FIRST
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_DEEPEST
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_ALL
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_PIVOT_ROW_STRATEGY
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_FIRST
- int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_MAX_-COLUMN
- int PPL_OPTIMIZATION_MODE_MINIMIZATION
- int PPL_OPTIMIZATION_MODE_MAXIMIZATION

11.5.1 Define Documentation

11.5.1.1 #define CONVERSION (unsigned)

Referenced by Parma_Polyhedra_Library::Interfaces::C::c_variable_default_output_function().

11.5.1.2 #define FORMAT "%u"

Referenced by Parma_Polyhedra_Library::Interfaces::C::c_variable_default_output_function().

11.5.2 Function Documentation

11.5.2.1 catch (...)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.2 catch (deterministic_timeout_exception &)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.3 catch (timeout_exception &)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.4 catch (const std::exception & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.5 catch (const std::runtime_error & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.6 catch (const std::overflow_error & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.7 catch (const std::logic_error & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.8 catch (const std::length_error & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.9 catch (const std::domain_error & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.10 catch (const std::invalid_argument & *e*)

Definition at line 2677 of file ppl_c_implementation_common.cc.

11.5.2.11 int ppl_add_Linear_Expression_to_Linear_Expression (ppl_Linear_Expression_t *dst*, ppl_const_Linear_Expression_t *src*) [related]

Definition at line 557 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.12 int ppl_Artificial_Parameter_coefficient (ppl_const_Artificial_Parameter_t *ap*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Definition at line 2488 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.13 int ppl_Artificial_Parameter_denominator (ppl_const_Artificial_Parameter_t *ap*, ppl_Coefficient_t *n*) [related]

Definition at line 2510 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.14 int ppl_Artificial_Parameter_get_Linear_Expression (ppl_const_Artificial_Parameter_t *ap*, ppl_Linear_Expression_t *le*) [related]

Definition at line 2478 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.15 int ppl_Artificial_Parameter_inhomogeneous_term (ppl_const_Artificial_Parameter_t *ap*, ppl_Coefficient_t *n*)

Definition at line 2500 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.16 int ppl_Artificial_Parameter_Sequence_const_iterator_dereference (ppl_const_Artificial_Parameter_Sequence_const_iterator_t *apit*, ppl_const_Artificial_Parameter_t * *pap*) [related]

Definition at line 2561 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.17 int ppl_Artificial_Parameter_Sequence_const_iterator_equal_test (ppl_const_Artificial_Parameter_Sequence_const_iterator_t *x*, ppl_const_Artificial_Parameter_Sequence_const_iterator_t *y*) [related]

Definition at line 2581 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.18 int ppl_Artificial_Parameter_Sequence_const_iterator_increment (ppl_Artificial_Parameter_Sequence_const_iterator_t *apit*) [related]

Definition at line 2572 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.19 int ppl_assign_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t *dst*, ppl_const_Artificial_Parameter_Sequence_const_iterator_t *src*) [related]

Definition at line 2550 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.20 int ppl_assign_Coefficient_from_Coefficient (ppl_Coefficient_t *dst*, ppl_const_Coefficient_t *src*) [related]

Definition at line 442 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.21 int ppl_assign_Coefficient_from_mpz_t (ppl_Coefficient_t *dst*, mpz_t *z*) [related]

Definition at line 434 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.22 int ppl_assign_Congruence_from_Congruence (ppl_Congruence_t *dst*, ppl_const_Congruence_t *src*) [related]

Definition at line 1311 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.23 int ppl_assign_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t *dst*, ppl_const_Congruence_System_const_iterator_t *src*) [related]

Definition at line 1496 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.24 int ppl_assign_Congruence_System_from_Congruence_System (ppl_Congruence_System_t *dst*, ppl_const_Congruence_System_t *src*) [related]

Definition at line 1419 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.25 int ppl_assign_Constraint_from_Constraint (ppl_Constraint_t *dst*, ppl_const_Constraint_t *src*) [related]

Definition at line 697 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.26 int ppl_assign_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t *dst*, ppl_const_Constraint_System_const_iterator_t *src*) [related]

Definition at line 895 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.27 int ppl_assign_Constraint_System_from_Constraint_System (ppl_Constraint_System_t *dst*, ppl_const_Constraint_System_t *src*) [related]

Definition at line 810 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.28 int ppl_assign_Generator_from_Generator (ppl_Generator_t *dst*, ppl_const_Generator_t *src*) [related]

Definition at line 1017 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.29 int ppl_assign_Generator_System_const_iterator_from_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t *dst*, ppl_const_Generator_System_const_iterator_t *src*) [related]

Definition at line 1206 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.30 int ppl_assign_Generator_System_from_Generator_System (ppl_Generator_System_t *dst*, ppl_const_Generator_System_t *src*) [related]

Definition at line 1130 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.31 int ppl_assign_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t *dst*, ppl_const_Grid_Generator_t *src*) [related]

Definition at line 1609 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.32 int ppl_assign_Grid_Generator_System_const_iterator_from_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_const_iterator_t *dst*, ppl_const_Grid_Generator_System_const_iterator_t *src*) [related]

Definition at line 1802 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.33 int ppl_assign_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_System_t *dst*, ppl_const_Grid_Generator_System_t *src*) [related]

Definition at line 1724 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.34 int ppl_assign_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t *dst*, ppl_const_Linear_Expression_t *src*) [related]

Definition at line 526 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.35 int ppl_assign_MIP_Problem_from_MIP_Problem (ppl_MIP_Problem_t *dst*, ppl_const_MIP_Problem_t *src*) [related]

Definition at line 1902 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.36 int ppl_assign_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t *dst*, ppl_const_PIP_Problem_t *src*) [related]

Definition at line 2180 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.37 int ppl_Coefficient_is_bounded (void) [related]

Definition at line 458 of file ppl_c_implementation_common.cc.

11.5.2.38 int ppl_Coefficient_max (mpz_t *max*) [related]

Definition at line 477 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class().

11.5.2.39 int ppl_Coefficient_min (mpz_t *min*) [related]

Definition at line 464 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class().

11.5.2.40 int ppl_Coefficient_OK (ppl_const_Coefficient_t) [related]

Definition at line 452 of file ppl_c_implementation_common.cc.

11.5.2.41 int ppl_Coefficient_to_mpz_t (ppl_const_Coefficient_t *c*, mpz_t *z*) [related]

Definition at line 420 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class(), and Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.42 int ppl_Congruence_coefficient (ppl_const_Congruence_t *c*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Definition at line 1329 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.43 int ppl_Congruence_inhomogeneous_term (ppl_const_Congruence_t *c*, ppl_Coefficient_t *n*) [related]

Definition at line 1340 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.44 int ppl_Congruence_modulus (ppl_const_Congruence_t *c*, ppl_Coefficient_t *m*) [related]

Definition at line 1350 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.45 int ppl_Congruence_OK (ppl_const_Congruence_t *c*) [related]

Definition at line 1360 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.46 int ppl_Congruence_space_dimension (ppl_const_Congruence_t *c*, ppl_dimension_type * *m*) [related]

Definition at line 1321 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.47 int ppl_Congruence_System_begin (ppl_const_Congruence_System_t *cs*, ppl_Congruence_System_const_iterator_t *cit*) [related]

Definition at line 1506 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.48 int ppl_Congruence_System_clear (ppl_Congruence_System_t *cs*) [related]

Definition at line 1444 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.49 int ppl_Congruence_System_const_iterator_dereference (ppl_const_Congruence_System_const_iterator_t *cit*, ppl_const_Congruence_t * *pc*) [related]

Definition at line 1527 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.50 int ppl_Congruence_System_const_iterator_equal_test (ppl_const_Congruence_System_const_iterator_t *x*, ppl_const_Congruence_System_const_iterator_t *y*) [related]

Definition at line 1547 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.51 int ppl_Congruence_System_const_iterator_increment (ppl_Congruence_System_-const_iterator_t *cit*) [related]

Definition at line 1538 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.52 int ppl_Congruence_System_empty (ppl_const_Congruence_System_t *cs*) [related]

Definition at line 1437 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.53 int ppl_Congruence_System_end (ppl_const_Congruence_System_t *cs*, ppl_Congruence_System_const_iterator_t *cit*) [related]

Definition at line 1516 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.54 int ppl_Congruence_System_insert_Congruence (ppl_Congruence_System_t *cs*, ppl_const_Congruence_t *c*) [related]

Definition at line 1451 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.55 int ppl_Congruence_System_OK (ppl_const_Congruence_System_t *cs*) [related]

Definition at line 1461 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.56 int ppl_Congruence_System_space_dimension (ppl_const_Congruence_System_t *cs*, ppl_dimension_type * *m*) [related]

Definition at line 1428 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.57 int ppl_Constraint_coefficient (ppl_const_Constraint_t *c*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Definition at line 730 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.58 int ppl_Constraint_inhomogeneous_term (ppl_const_Constraint_t *c*, ppl_Coefficient_t *n*) [related]

Definition at line 741 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.59 int ppl_Constraint_OK (ppl_const_Constraint_t *c*) [related]

Definition at line 751 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.60 int ppl_Constraint_space_dimension (ppl_const_Constraint_t *c*, ppl_dimension_type * *m*) [related]

Definition at line 707 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.61 int ppl_Constraint_System_begin (ppl_const_Constraint_System_t *cs*, ppl_Constraint_System_const_iterator_t *cit*) [related]

Definition at line 905 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.62 int ppl_Constraint_System_clear (ppl_Constraint_System_t *cs*) [related]

Definition at line 843 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.63 int ppl_Constraint_System_const_iterator_dereference (ppl_const_Constraint_System_const_iterator_t *cit*, ppl_const_Constraint_t * *pc*) [related]

Definition at line 926 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.64 int ppl_Constraint_System_const_iterator_equal_test (ppl_const_Constraint_System_const_iterator_t *x*, ppl_const_Constraint_System_const_iterator_t *y*) [related]

Definition at line 946 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.65 int ppl_Constraint_System_const_iterator_increment (ppl_Constraint_System_const_iterator_t *cit*) [related]

Definition at line 937 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.66 int ppl_Constraint_System_empty (ppl_const_Constraint_System_t *cs*) [related]

Definition at line 828 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.67 int ppl_Constraint_System_end (ppl_const_Constraint_System_t *cs*, ppl_Constraint_System_const_iterator_t *cit*) [related]

Definition at line 915 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.68 int ppl_Constraint_System_has_strict_inequalities (ppl_const_Constraint_System_t *cs*) [related]

Definition at line 836 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.69 int ppl_Constraint_System_insert_Constraint (ppl_Constraint_System_t *cs*, ppl_const_Constraint_t *c*) [related]

Definition at line 850 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.70 int ppl_Constraint_System_OK (ppl_const_Constraint_System_t *cs*) [related]

Definition at line 860 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.71 int ppl_Constraint_System_space_dimension (ppl_const_Constraint_System_t *cs*, ppl_dimension_type * *m*) [related]

Definition at line 819 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.72 int ppl_Constraint_type (ppl_const_Constraint_t *c*) [related]

Definition at line 715 of file ppl_c_implementation_common.cc.

References PPL_CONSTRAINT_TYPE_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_OR_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_THAN, and Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.73 int ppl_delete_Artificial_Parameter_Sequence_const_iterator (ppl_const_Artificial_Parameter_Sequence_const_iterator_t *apit*) [related]

Definition at line 2541 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.74 int ppl_delete_Coefficient (ppl_const_Coefficient_t *c*) [related]

Definition at line 427 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.75 int ppl_delete_Congruence (ppl_const_Congruence_t *le*) [related]

Definition at line 1304 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.76 int ppl_delete_Congruence_System (ppl_const_Congruence_System_t *cs*) [related]

Definition at line 1411 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.77 int ppl_delete_Congruence_System_const_iterator (ppl_const_Congruence_System_-const_iterator_t *cit*) [related]

Definition at line 1487 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.78 int ppl_delete_Constraint (ppl_const_Constraint_t *le*) [related]

Definition at line 690 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.79 int ppl_delete_Constraint_System (ppl_const_Constraint_System_t *cs*) [related]

Definition at line 802 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.80 int ppl_delete_Constraint_System_const_iterator (ppl_const_Constraint_System_-const_iterator_t *cit*) [related]

Definition at line 886 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.81 int ppl_delete_Generator (ppl_const_Generator_t *le*) [related]

Definition at line 1010 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.82 int ppl_delete_Generator_System (ppl_const_Generator_System_t *gs*) [related]

Definition at line 1122 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.83 int ppl_delete_Generator_System_const_iterator (ppl_const_Generator_System_const_iterator_t *git*) [related]

Definition at line 1198 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.84 int ppl_delete_Grid_Generator (ppl_const_Grid_Generator_t *le*) [related]

Definition at line 1601 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.85 int ppl_delete_Grid_Generator_System (ppl_const_Grid_Generator_System_t *gs*) [related]

Definition at line 1716 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.86 int ppl_delete_Grid_Generator_System_const_iterator (ppl_const_Grid_Generator_System_const_iterator_t *git*) [related]

Definition at line 1794 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.87 int ppl_delete_Linear_Expression (ppl_const_Linear_Expression_t *le*) [related]

Definition at line 518 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.88 int ppl_delete_MIP_Problem (ppl_const_MIP_Problem_t *mip*) [related]

Definition at line 1895 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.89 int ppl_delete_PIP_Problem (ppl_const_PIP_Problem_t *pip*) [related]

Definition at line 2190 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.90 int ppl_Generator_coefficient (ppl_const_Generator_t *g*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Definition at line 1052 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.91 int ppl_Generator_divisor (ppl_const_Generator_t *g*, ppl_Coefficient_t *n*) [related]

Definition at line 1063 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.92 int ppl_Generator_OK (ppl_const_Generator_t *g*) [related]

Definition at line 1073 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.93 int ppl_Generator_space_dimension (ppl_const_Generator_t *g*, ppl_dimension_type * *m*) [related]

Definition at line 1027 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.94 int ppl_Generator_System_begin (ppl_const_Generator_System_t *gs*, ppl_Generator_System_const_iterator_t *git*) [related]

Definition at line 1216 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.95 int ppl_Generator_System_clear (ppl_Generator_System_t *gs*) [related]

Definition at line 1155 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.96 int ppl_Generator_System_const_iterator_dereference (ppl_const_Generator_System_const_iterator_t *git*, ppl_const_Generator_t * *pg*) [related]

Definition at line 1237 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.97 int ppl_Generator_System_const_iterator_equal_test (ppl_const_Generator_System_const_iterator_t *x*, ppl_const_Generator_System_const_iterator_t *y*) [related]

Definition at line 1257 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.98 int ppl_Generator_System_const_iterator_increment (ppl_Generator_System_const_iterator_t *git*) [related]

Definition at line 1248 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.99 int ppl_Generator_System_empty (ppl_const_Generator_System_t *gs*) [related]

Definition at line 1148 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.100 int ppl_Generator_System_end (ppl_const_Generator_System_t *gs*, ppl_Generator_System_const_iterator_t *git*) [related]

Definition at line 1226 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.101 int ppl_Generator_System_insert_Generator (ppl_Generator_System_t *gs*, ppl_const_Generator_t *g*) [related]

Definition at line 1162 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.102 int ppl_Generator_System_OK (ppl_const_Generator_System_t *gs*) [related]

Definition at line 1172 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.103 int ppl_Generator_System_space_dimension (ppl_const_Generator_System_t *gs*, ppl_dimension_type * *m*) [related]

Definition at line 1139 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.104 int ppl_Generator_type (ppl_const_Generator_t *g*) [related]

Definition at line 1035 of file ppl_c_implementation_common.cc.

References PPL_GENERATOR_TYPE_CLOSURE_POINT, PPL_GENERATOR_TYPE_LINE, PPL_GENERATOR_TYPE_POINT, PPL_GENERATOR_TYPE_RAY, and Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.105 int ppl_Grid_Generator_coefficient (ppl_const_Grid_Generator_t *g*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Definition at line 1642 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.106 int ppl_Grid_Generator_divisor (ppl_const_Grid_Generator_t *g*, ppl_Coefficient_t *n*) [related]

Definition at line 1653 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.107 int ppl_Grid_Generator_OK (ppl_const_Grid_Generator_t *g*) [related]

Definition at line 1663 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.108 int ppl_Grid_Generator_space_dimension (ppl_const_Grid_Generator_t *g*, ppl_dimension_type * *m*) [related]

Definition at line 1619 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.109 int ppl_Grid_Generator_System_begin (ppl_const_Grid_Generator_System_t *gs*, ppl_Grid_Generator_System_const_iterator_t *git*) [related]

Definition at line 1813 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.110 int ppl_Grid_Generator_System_clear (ppl_Grid_Generator_System_t *gs*) [related]

Definition at line 1749 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.111 int ppl_Grid_Generator_System_const_iterator_dereference (ppl_const_Grid_Generator_System_const_iterator_t *git*, ppl_const_Grid_Generator_t * *pg*) [related]

Definition at line 1835 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.112 int ppl_Grid_Generator_System_const_iterator_equal_test (ppl_const_Grid_Generator_System_const_iterator_t *x*, ppl_const_Grid_Generator_System_const_iterator_t *y*) [related]

Definition at line 1855 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.113 int ppl_Grid_Generator_System_const_iterator_increment (ppl_Grid_Generator_System_const_iterator_t *git*) [related]

Definition at line 1846 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.114 int ppl_Grid_Generator_System_empty (ppl_const_Grid_Generator_System_t *gs*) [related]

Definition at line 1742 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.115 int ppl_Grid_Generator_System_end (ppl_const_Grid_Generator_System_t *gs*, ppl_Grid_Generator_System_const_iterator_t *git*) [related]

Definition at line 1824 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.116 int ppl_Grid_Generator_System_insert_Grid_Generator (ppl_Grid_Generator_System_t *gs*, ppl_const_Grid_Generator_t *g*) [related]

Definition at line 1757 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.117 int ppl_Grid_Generator_System_OK (ppl_const_Grid_Generator_System_t *gs*) [related]

Definition at line 1767 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.118 int ppl_Grid_Generator_System_space_dimension (ppl_const_Grid_Generator_System_t *gs*, ppl_dimension_type * *m*) [related]

Definition at line 1733 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.119 int ppl_Grid_Generator_type (ppl_const_Grid_Generator_t *g*) [related]

Definition at line 1627 of file ppl_c_implementation_common.cc.

References PPL_GRID_GENERATOR_TYPE_LINE, PPL_GRID_GENERATOR_TYPE_-PARAMETER, PPL_GRID_GENERATOR_TYPE_POINT, and Parma_Polyhedra_-Library::Interfaces::C::to_const().

11.5.2.120 int ppl_Linear_Expression_add_to_coefficient (ppl_Linear_Expression_t *le*, ppl_dimension_type *var*, ppl_const_Coefficient_t *n*) [related]

Definition at line 535 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.121 int ppl_Linear_Expression_add_to_inhomogeneous (ppl_Linear_Expression_t *le*, ppl_const_Coefficient_t *n*) [related]

Definition at line 546 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.122 int ppl_Linear_Expression_all_homogeneous_terms_are_zero (ppl_const_Linear_Expression_t *le*) [related]

Definition at line 628 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.123 int ppl_Linear_Expression_coefficient (ppl_const_Linear_Expression_t *le*, ppl_dimension_type *var*, ppl_Coefficient_t *n*) [related]

Definition at line 594 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.124 int ppl_Linear_Expression_inhomogeneous_term (ppl_const_Linear_Expression_t *le*, ppl_Coefficient_t *n*) [related]

Definition at line 605 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.125 int ppl_Linear_Expression_is_zero (ppl_const_Linear_Expression_t *le*) [related]

Definition at line 621 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.126 int ppl_Linear_Expression_OK (ppl_const_Linear_Expression_t *le*) [related]

Definition at line 615 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.127 int ppl_Linear_Expression_space_dimension (ppl_const_Linear_Expression_t *le*, ppl_dimension_type * *m*) [related]

Definition at line 586 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.128 int ppl_MIP_Problem_add_constraint (ppl_MIP_Problem_t *mip*, ppl_const_Constraint_t *c*) [related]

Definition at line 2010 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.129 int ppl_MIP_Problem_add_constraints (ppl_MIP_Problem_t *mip*, ppl_const_Constraint_System_t *cs*) [related]

Definition at line 2020 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.130 int ppl_MIP_Problem_add_space_dimensions_and_embed (ppl_MIP_Problem_t *mip*, ppl_dimension_type *d*) [related]

Definition at line 1988 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.131 int ppl_MIP_Problem_add_to_integer_space_dimensions (ppl_MIP_Problem_t *mip*, ppl_dimension_type *ds*[ ], size_t *n*) [related]

Definition at line 1997 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.132 int ppl_MIP_Problem_clear (ppl_MIP_Problem_t *mip*) [related]

Definition at line 1981 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.133 int ppl_MIP_Problem_constraint_at_index (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type *i*, ppl_const_Constraint_t * *pc*) [related]

Definition at line 1950 of file ppl_c_implementation_common.cc.

References ppl_MIP_Problem_tag::ppl_MIP_Problem_number_of_constraints(), and Parma_Polyhedra_-Library::Interfaces::C::to_const().

11.5.2.134 int ppl_MIP_Problem_evaluate_objective_function (ppl_const_MIP_Problem_t *mip*, ppl_const_Generator_t *g*, ppl_Coefficient_t *num*, ppl_Coefficient_t *den*) [related]

Definition at line 2062 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.135 int ppl_MIP_Problem_external_memory_in_bytes (ppl_const_MIP_Problem_t *mip*, size_t * *sz*) [related]

Definition at line 2138 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.136 int ppl_MIP_Problem_feasible_point (ppl_const_MIP_Problem_t *mip*, ppl_const_Generator_t * *pg*) [related]

Definition at line 2076 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.137 int ppl_MIP_Problem_get_control_parameter (ppl_const_MIP_Problem_t *mip*, int *name*) [related]

Definition at line 2105 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.138 int ppl_MIP_Problem_integer_space_dimensions (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type *ds*[ ]) [related]

Definition at line 1929 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.139 int ppl_MIP_Problem_is_satisfiable (ppl_const_MIP_Problem_t *mip*) [related]

Definition at line 2050 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.140 int ppl_MIP_Problem_number_of_constraints (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type * *m*) [related]

Definition at line 1941 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.141 int ppl_MIP_Problem_number_of_integer_space_dimensions (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type * *m*) [related]

Definition at line 1920 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.142 int ppl_MIP_Problem_objective_function (ppl_const_MIP_Problem_t *mip*, ppl_const_Linear_Expression_t * *ple*) [related]

Definition at line 1966 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.143 int ppl_MIP_Problem_OK (ppl_const_MIP_Problem_t *mip*) [related]

Definition at line 2124 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.144 int ppl_MIP_Problem_optimal_value (ppl_const_MIP_Problem_t *mip*, ppl_Coefficient_t *num*, ppl_Coefficient_t *den*) [related]

Definition at line 2094 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.145 int ppl_MIP_Problem_optimization_mode (ppl_const_MIP_Problem_t *mip*) [related]

Definition at line 1975 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.146 int ppl_MIP_Problem_optimizing_point (ppl_const_MIP_Problem_t *mip*, ppl_const_Generator_t * *pg*) [related]

Definition at line 2085 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.147 int ppl_MIP_Problem_set_control_parameter (ppl_MIP_Problem_t *mip*, int *value*) [related]

Definition at line 2114 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.148 int ppl_MIP_Problem_set_objective_function (ppl_MIP_Problem_t *mip*, ppl_const_Linear_Expression_t *le*) [related]

Definition at line 2030 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.149 int ppl_MIP_Problem_set_optimization_mode (ppl_MIP_Problem_t *mip*, int *mode*) [related]

Definition at line 2040 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.150 int ppl_MIP_Problem_solve (ppl_const_MIP_Problem_t *mip*) [related]

Definition at line 2056 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.151 int ppl_MIP_Problem_space_dimension (ppl_const_MIP_Problem_t *mip*, ppl_dimension_type * *m*) [related]

Definition at line 1912 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.152 int ppl_MIP_Problem_total_memory_in_bytes (ppl_const_MIP_Problem_t *mip*, size_t * *sz*) [related]

Definition at line 2130 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.153 int ppl_multiply_Linear_Expression_by_Coefficient (ppl_Linear_Expression_t *le*, ppl_const_Coefficient_t *n*) [related]

Definition at line 576 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.154 int ppl_new_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t * *papit*) [related]

Definition at line 2524 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.155 int ppl_new_Artificial_Parameter_Sequence_const_iterator_from_Artificial_Parameter_Sequence_const_iterator (ppl_Artificial_Parameter_Sequence_const_iterator_t * *papit*, ppl_const_Artificial_Parameter_Sequence_const_iterator_t *apit*) [related]

Definition at line 2532 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.156 int ppl_new_Coefficient (ppl_Coefficient_t * *pc*) [related]

Definition at line 397 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.157 int ppl_new_Coefficient_from_Coefficient (ppl_Coefficient_t * *pc*, ppl_const_Coefficient_t *c*) [related]

Definition at line 411 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.158 int ppl_new_Coefficient_from_mpz_t (ppl_Coefficient_t * *pc*, mpz_t *z*) [related]

Definition at line 404 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.159 int ppl_new_Congruence (ppl_Congruence_t * *pc*, ppl_const_Linear_Expression_t *le*, ppl_const_Coefficient_t *m*) [related]

Definition at line 1268 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.160 int ppl_new_Congruence_from_Congruence (ppl_Congruence_t * *pc*, ppl_const_Congruence_t *c*) [related]

Definition at line 1295 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.161 int ppl_new_Congruence_System (ppl_Congruence_System_t * *pcs*) [related]

Definition at line 1377 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.162 int ppl_new_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t * *pcit*) [related]

Definition at line 1470 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.163 int ppl_new_Congruence_System_const_iterator_from_Congruence_System_const_iterator (ppl_Congruence_System_const_iterator_t * *pcit*, ppl_const_Congruence_System_const_iterator_t *cit*) [related]

Definition at line 1478 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.164 int ppl_new_Congruence_System_from_Congruence (ppl_Congruence_System_t * *pcs*, ppl_const_Congruence_t *c*) [related]

Definition at line 1393 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.165 int ppl_new_Congruence_System_from_Congruence_System (ppl_Congruence_System_t * *pcs*, ppl_const_Congruence_System_t *cs*) [related]

Definition at line 1403 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.166 int ppl_new_Congruence_System_zero_dim_empty (ppl_Congruence_System_t * *pcs*) [related]

Definition at line 1384 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.167 int ppl_new_Congruence_zero_dim_false (ppl_Congruence_t * *pc*) [related]

Definition at line 1281 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.168 int ppl_new_Congruence_zero_dim_integrality (ppl_Congruence_t * *pc*) [related]

Definition at line 1288 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.169 int ppl_new_Constraint (ppl_Constraint_t * *pc*, ppl_const_Linear_Expression_t *le*, enum ppl_enum_Constraint_Type *t*) [related]

Definition at line 636 of file ppl_c_implementation_common.cc.

References PPL_CONSTRAINT_TYPE_EQUAL, PPL_CONSTRAINT_TYPE_GREATER_OR_-EQUAL, PPL_CONSTRAINT_TYPE_GREATER_THAN, PPL_CONSTRAINT_TYPE_LESS_OR_-EQUAL, PPL_CONSTRAINT_TYPE_LESS_THAN, Parma_Polyhedra_Library::Interfaces::C::to_-const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.170 int ppl_new_Constraint_from_Constraint (ppl_Constraint_t * *pc*, ppl_const_Constraint_t *c*) [related]

Definition at line 681 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.171 int ppl_new_Constraint_System (ppl_Constraint_System_t * *pcs*) [related]

Definition at line 768 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.172 int ppl_new_Constraint_System_const_iterator (ppl_Constraint_System_const_-iterator_t * *pcit*) [related]

Definition at line 869 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.173 int ppl_new_Constraint_System_const_iterator_from_Constraint_System_const_iterator (ppl_Constraint_System_const_iterator_t * *pcit*, ppl_const_Constraint_System_const_iterator_t *cit*) [related]

Definition at line 877 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.174 int ppl_new_Constraint_System_from_Constraint (ppl_Constraint_System_t * *pcs*, ppl_const_Constraint_t *c*) [related]

Definition at line 784 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.175 int ppl_new_Constraint_System_from_Constraint_System (ppl_Constraint_System_t * *pcs*, ppl_const_Constraint_System_t *cs*) [related]

Definition at line 794 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.176 int ppl_new_Constraint_System_zero_dim_empty (ppl_Constraint_System_t * *pcs*) [related]

Definition at line 775 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.177 int ppl_new_Constraint_zero_dim_false (ppl_Constraint_t * *pc*) [related]

Definition at line 667 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.178 int ppl_new_Constraint_zero_dim_positivity (ppl_Constraint_t * *pc*) [related]

Definition at line 674 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.179 int ppl_new_Generator (ppl_Generator_t * *pg*, ppl_const_Linear_Expression_t *le*, enum ppl_enum_Generator_Type *t*, ppl_const_Coefficient_t *d*) [related]

Definition at line 957 of file ppl_c_implementation_common.cc.

References PPL_GENERATOR_TYPE_CLOSURE_POINT, PPL_GENERATOR_TYPE_LINE, PPL_GENERATOR_TYPE_POINT, PPL_GENERATOR_TYPE_RAY, Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.180 int ppl_new_Generator_from_Generator (ppl_Generator_t * *pg*, ppl_const_Generator_t *g*) [related]

Definition at line 1001 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.181 int ppl_new_Generator_System (ppl_Generator_System_t * *pgs*) [related]

Definition at line 1090 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.182 int ppl_new_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t * *pgit*) [related]

Definition at line 1181 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.183 int ppl_new_Generator_System_const_iterator_from_Generator_System_const_iterator (ppl_Generator_System_const_iterator_t * *pgit*, ppl_const_Generator_System_const_iterator_t *git*) [related]

Definition at line 1189 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.184 int ppl_new_Generator_System_from_Generator (ppl_Generator_System_t * *pgs*, ppl_const_Generator_t *g*) [related]

Definition at line 1104 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.185 int ppl_new_Generator_System_from_Generator_System (ppl_Generator_System_t * *pgs*, ppl_const_Generator_System_t *gs*) [related]

Definition at line 1114 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.186 int ppl_new_Generator_System_zero_dim_univ (ppl_Generator_System_t * *pgs*)

Definition at line 1097 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.187 int ppl_new_Generator_zero_dim_closure_point (ppl_Generator_t * *pg*) [related]

Definition at line 994 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.188 int ppl_new_Generator_zero_dim_point (ppl_Generator_t * *pg*) [related]

Definition at line 987 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.189 int ppl_new_Grid_Generator (ppl_Grid_Generator_t * *pg*, ppl_const_Linear_-Expression_t *le*, enum ppl_enum_Grid_Generator_Type *t*, ppl_const_Coefficient_t *d*) [related]

Definition at line 1558 of file ppl_c_implementation_common.cc.

References PPL_GRID_GENERATOR_TYPE_LINE, PPL_GRID_GENERATOR_-TYPE_PARAMETER, PPL_GRID_GENERATOR_TYPE_POINT, Parma_Polyhedra_-Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.190 int ppl_new_Grid_Generator_from_Grid_Generator (ppl_Grid_Generator_t * *pg*, ppl_const_Grid_Generator_t *g*) [related]

Definition at line 1592 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.191 int ppl_new_Grid_Generator_System (ppl_Grid_Generator_System_t * *pgs*) [related]

Definition at line 1682 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.192 int ppl_new_Grid_Generator_System_const_iterator (ppl_Grid_Generator_System_-const_iterator_t * *pgit*) [related]

Definition at line 1776 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.193 int ppl_new_Grid_Generator_System_const_iterator_from_Grid_Generator_-System_const_iterator (ppl_Grid_Generator_System_const_iterator_t * *pgit*, ppl_const_Grid_Generator_System_const_iterator_t *git*) [related]

Definition at line 1784 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.194 int ppl_new_Grid_Generator_System_from_Grid_Generator (ppl_Grid_Generator_System_t * *pgs*, ppl_const_Grid_Generator_t *g*) [related]

Definition at line 1699 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.195 int ppl_new_Grid_Generator_System_from_Grid_Generator_System (ppl_Grid_Generator_System_t * *pgs*, ppl_const_Grid_Generator_System_t *gs*) [related]

Definition at line 1708 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_-Library::Interfaces::C::to_nonconst().

11.5.2.196 int ppl_new_Grid_Generator_System_zero_dim_univ (ppl_Grid_Generator_System_t * *pgs*)

Definition at line 1690 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.197 int ppl_new_Grid_Generator_zero_dim_point (ppl_Grid_Generator_t * *pg*) [related]

Definition at line 1585 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.198 int ppl_new_Linear_Expression (ppl_Linear_Expression_t * *ple*) [related]

Definition at line 492 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.199 int ppl_new_Linear_Expression_from_Congruence (ppl_Linear_Expression_t * *ple*, ppl_const_Congruence_t *c*) [related]

Definition at line 1366 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.200 int ppl_new_Linear_Expression_from_Constraint (ppl_Linear_Expression_t * *ple*, ppl_const_Constraint_t *c*) [related]

Definition at line 757 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.201 int ppl_new_Linear_Expression_from_Generator (ppl_Linear_Expression_t * *ple*, ppl_const_Generator_t *g*) [related]

Definition at line 1079 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.202 int ppl_new_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t * *ple*, ppl_const_Linear_Expression_t *le*) [related]

Definition at line 510 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.203 int ppl_new_Linear_Expression_with_dimension (ppl_Linear_Expression_t * *ple*, ppl_dimension_type *d*) [related]

Definition at line 499 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.204 int ppl_new_MIP_Problem (ppl_MIP_Problem_t * *pmip*, ppl_dimension_type *d*, ppl_const_Constraint_System_t *cs*, ppl_const_Linear_Expression_t *le*, int *m*) [related]

Definition at line 1872 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.205 int ppl_new_MIP_Problem_from_MIP_Problem (ppl_MIP_Problem_t * *pmip*, ppl_const_MIP_Problem_t *mip*) [related]

Definition at line 1886 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.206 int ppl_new_MIP_Problem_from_space_dimension (ppl_MIP_Problem_t * *pmip*, ppl_dimension_type *d*) [related]

Definition at line 1864 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.207 int ppl_new_PIP_Problem_from_constraints (ppl_PIP_Problem_t * *ppip*, ppl_dimension_type *d*, ppl_Constraint_System_const_iterator_t *first*, ppl_Constraint_System_const_iterator_t *last*, size_t *n*, ppl_dimension_type *ds*[ ]) [related]

Definition at line 2164 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.208 int ppl_new_PIP_Problem_from_PIP_Problem (ppl_PIP_Problem_t * *dpip*, ppl_const_PIP_Problem_t *pip*) [related]

Definition at line 2154 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.209 int ppl_new_PIP_Problem_from_space_dimension (ppl_PIP_Problem_t * *ppip*, ppl_dimension_type *d*) [related]

Definition at line 2146 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.210 int ppl_PIP_Decision_Node_get_child_node (ppl_const_PIP_Decision_Node_t *pip_dec*, int *b*, ppl_const_PIP_Tree_Node_t * *pip_tree*) [related]

Definition at line 2468 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.211 int ppl_PIP_Decision_Node_OK (ppl_const_PIP_Decision_Node_t *pip_dec*)

Definition at line 2462 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.212 int ppl_PIP_Problem_add_constraint (ppl_PIP_Problem_t *pip*, ppl_const_Constraint_t *c*) [related]

Definition at line 2278 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.213 int ppl_PIP_Problem_add_constraints (ppl_PIP_Problem_t *pip*, ppl_const_Constraint_System_t *cs*) [related]

Definition at line 2288 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.214 int ppl_PIP_Problem_add_space_dimensions_and_embed (ppl_PIP_Problem_t *pip*, ppl_dimension_type *pip_vars*, ppl_dimension_type *pip_params*) [related]

Definition at line 2256 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.215 int ppl_PIP_Problem_add_to_parameter_space_dimensions (ppl_PIP_Problem_t *pip*, ppl_dimension_type *ds*[ ], size_t *n*) [related]

Definition at line 2266 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.216 int ppl_PIP_Problem_clear (ppl_PIP_Problem_t *pip*) [related]

Definition at line 2250 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.217 int ppl_PIP_Problem_constraint_at_index (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type *i*, ppl_const_Constraint_t * *pc*) [related]

Definition at line 2235 of file ppl_c_implementation_common.cc.

References ppl_PIP_Problem_tag::ppl_PIP_Problem_number_of_constraints(), and Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.218 int ppl_PIP_Problem_external_memory_in_bytes (ppl_const_PIP_Problem_t *pip*, size_t * *sz*) [related]

Definition at line 2373 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.219 int ppl_PIP_Problem_get_big_parameter_dimension (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *pd*) [related]

Definition at line 2349 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.220 int ppl_PIP_Problem_get_control_parameter (ppl_const_PIP_Problem_t *pip*, int *name*) [related]

Definition at line 2330 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.221 int ppl_PIP_Problem_is_satisfiable (ppl_const_PIP_Problem_t *pip*) [related]

Definition at line 2297 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.222 int ppl_PIP_Problem_number_of_constraints (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *m*) [related]

Definition at line 2226 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.223 int ppl_PIP_Problem_number_of_parameter_space_dimensions (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *m*) [related]

Definition at line 2206 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.224 int ppl_PIP_Problem_OK (ppl_const_PIP_Problem_t *pip*) [related]

Definition at line 2324 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.225 int ppl_PIP_Problem_optimizing_solution (ppl_const_PIP_Problem_t *pip*, ppl_const_PIP_Tree_Node_t * *ppip_tree*) [related]

Definition at line 2316 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.226 int ppl_PIP_Problem_parameter_space_dimensions (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type *ds*[ ]) [related]

Definition at line 2214 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.227 int ppl_PIP_Problem_set_big_parameter_dimension (ppl_PIP_Problem_t *pip*, ppl_dimension_type *d*) [related]

Definition at line 2357 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.228 int ppl_PIP_Problem_set_control_parameter (ppl_PIP_Problem_t *pip*, int *value*) [related]

Definition at line 2339 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.229 int ppl_PIP_Problem_solution (ppl_const_PIP_Problem_t *pip*, ppl_const_PIP_Tree_Node_t * *ppip_tree*) [related]

Definition at line 2308 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.230 int ppl_PIP_Problem_solve (ppl_const_PIP_Problem_t *pip*) [related]

Definition at line 2302 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.231 int ppl_PIP_Problem_space_dimension (ppl_const_PIP_Problem_t *pip*, ppl_dimension_type * *m*) [related]

Definition at line 2197 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.232 int ppl_PIP_Problem_total_memory_in_bytes (ppl_const_PIP_Problem_t *pip*, size_t * *sz*) [related]

Definition at line 2365 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.233 int ppl_PIP_Solution_Node_get_parametric_values (ppl_const_PIP_Solution_Node_t *pip_sol*, ppl_dimension_type *var*, ppl_const_Linear_Expression_t * *le*) [related]

Definition at line 2445 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.234 int ppl_PIP_Solution_Node_OK (ppl_const_PIP_Solution_Node_t *pip_sol*)

Definition at line 2456 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.235 int ppl_PIP_Tree_Node_as_decision (ppl_const_PIP_Tree_Node_t *spip_tree*, ppl_const_PIP_Decision_Node_t * *dpip_tree*) [related]

Definition at line 2389 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.236 int ppl_PIP_Tree_Node_as_solution (ppl_const_PIP_Tree_Node_t *spip_tree*, ppl_const_PIP_Solution_Node_t * *dpip_tree*) [related]

Definition at line 2381 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.237 int ppl_PIP_Tree_Node_begin (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_Artificial_Parameter_Sequence_const_iterator_t *pit*) [related]

Definition at line 2423 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.238 int ppl_PIP_Tree_Node_end (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_Artificial_Parameter_Sequence_const_iterator_t *pit*) [related]

Definition at line 2434 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.2.239 int ppl_PIP_Tree_Node_get_constraints (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_const_Constraint_System_t * *pcs*) [related]

Definition at line 2397 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.240 int ppl_PIP_Tree_Node_number_of_artificials (ppl_const_PIP_Tree_Node_t *pip_tree*, ppl_dimension_type * *m*) [related]

Definition at line 2413 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.241 int ppl_PIP_Tree_Node_OK (ppl_const_PIP_Tree_Node_t *pip_tree*) [related]

Definition at line 2407 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const().

11.5.2.242 int ppl_set_error_handler (error_handler_type *h*)

Definition at line 175 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::user_error_handler.

11.5.2.243 int ppl_subtract_Linear_Expression_from_Linear_Expression (ppl_Linear_Expression_t *dst*, ppl_const_Linear_Expression_t *src*) [related]

Definition at line 567 of file ppl_c_implementation_common.cc.

References Parma_Polyhedra_Library::Interfaces::C::to_const(), and Parma_Polyhedra_Library::Interfaces::C::to_nonconst().

11.5.3 Variable Documentation

11.5.3.1 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_NAME_PRICING [related]

Definition at line 155 of file ppl_c_implementation_common.cc.

11.5.3.2 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_EXACT [related]

Definition at line 157 of file ppl_c_implementation_common.cc.

11.5.3.3 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_STEEPEST_EDGE_FLOAT [related]

Definition at line 156 of file ppl_c_implementation_common.cc.

11.5.3.4 int PPL_MIP_PROBLEM_CONTROL_PARAMETER_PRICING_TEXTBOOK [related]

Definition at line 158 of file ppl_c_implementation_common.cc.

11.5.3.5 int PPL_MIP_PROBLEM_STATUS_OPTIMIZED [related]

Definition at line 153 of file ppl_c_implementation_common.cc.

11.5.3.6 int PPL_MIP_PROBLEM_STATUS_UNBOUNDED [related]

Definition at line 152 of file ppl_c_implementation_common.cc.

11.5.3.7 int PPL_MIP_PROBLEM_STATUS_UNFEASIBLE [related]

Definition at line 151 of file ppl_c_implementation_common.cc.

11.5.3.8 int PPL_OPTIMIZATION_MODE_MAXIMIZATION [related]

Definition at line 172 of file ppl_c_implementation_common.cc.

11.5.3.9 int PPL_OPTIMIZATION_MODE_MINIMIZATION [related]

Definition at line 171 of file ppl_c_implementation_common.cc.

11.5.3.10 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_ALL [related]

Definition at line 166 of file ppl_c_implementation_common.cc.

11.5.3.11 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_DEEPEST [related]

Definition at line 165 of file ppl_c_implementation_common.cc.

11.5.3.12 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_CUTTING_STRATEGY_FIRST [related]

Definition at line 164 of file ppl_c_implementation_common.cc.

11.5.3.13 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_CUTTING_STRATEGY [related]

Definition at line 163 of file ppl_c_implementation_common.cc.

11.5.3.14 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_NAME_PIVOT_ROW_STRATEGY [related]

Definition at line 167 of file ppl_c_implementation_common.cc.

11.5.3.15 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_FIRST [related]

Definition at line 168 of file ppl_c_implementation_common.cc.

11.5.3.16 int PPL_PIP_PROBLEM_CONTROL_PARAMETER_PIVOT_ROW_STRATEGY_MAX_COLUMN [related]

Definition at line 169 of file ppl_c_implementation_common.cc.

11.5.3.17 int PPL_PIP_PROBLEM_STATUS_OPTIMIZED [related]

Definition at line 161 of file ppl_c_implementation_common.cc.

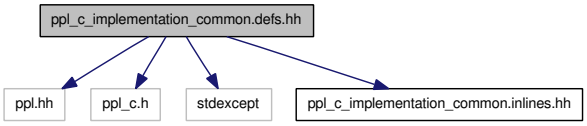
11.5.3.18 int PPL_PIP_PROBLEM_STATUS_UNFEASIBLE [related]

Definition at line 160 of file ppl_c_implementation_common.cc.

11.6 ppl_c_implementation_common.defs.hh File Reference

```
#include "ppl.hh"
#include "ppl_c.h"
#include <stdexcept>
#include "ppl_c_implementation_common.inlines.hh"
```

Include dependency graph for ppl_c_implementation_common.defs.hh:



Classes

- class Parma_Polyhedra_Library::Interfaces::C::Array_Partial_Function_Wrapper

  A class to wrap an array of fixed length into a partial function interface suitable for the map_space_dimension() methods.

- class Parma_Polyhedra_Library::Interfaces::C::timeout_exception
- class Parma_Polyhedra_Library::Interfaces::C::deterministic_timeout_exception

Namespaces

- namespace Parma_Polyhedra_Library
- namespace Parma_Polyhedra_Library::Interfaces
- namespace Parma_Polyhedra_Library::Interfaces::C

Defines

- #define PPL_NO_AUTOMATIC_INITIALIZATION
- #define CATCH_STD_EXCEPTION(exception, code)
- #define CATCH_ALL

- #define DECLARE_CONVERSIONS(Type, CPP_Type)
- #define DEFINE_PRINT_FUNCTIONS(Type)
- #define DEFINE_ASCII_DUMP_FUNCTIONS(Type)
- #define DEFINE_ASCII_LOAD_FUNCTIONS(Type)
- #define DEFINE_ASCII_DUMP_LOAD_FUNCTIONS(Type)
- #define DEFINE_OUTPUT_FUNCTIONS(Type)

Typedefs

- typedef void(∗ Parma_Polyhedra_Library::Interfaces::C::error_handler_type)(enum ppl_enum_error_code code, const char ∗description)

Functions

- void Parma_Polyhedra_Library::Interfaces::C::notify_error (enum ppl_enum_error_code code, const char ∗description)
- Relation_Symbol Parma_Polyhedra_Library::Interfaces::C::relation_symbol (enum ppl_enum_Constraint_Type t)
- Bounded_Integer_Type_Width Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_width (enum ppl_enum_Bounded_Integer_Type_Width w)
- Bounded_Integer_Type_Representation Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_representation (enum ppl_enum_Bounded_Integer_Type_Representation r)
- void Parma_Polyhedra_Library::Interfaces::C::reset_timeout ()
- void Parma_Polyhedra_Library::Interfaces::C::reset_deterministic_timeout ()

11.6.1 Define Documentation

11.6.1.1 #define CATCH_ALL

Definition at line 144 of file ppl_c_implementation_common.defs.hh.

11.6.1.2 #define CATCH_STD_EXCEPTION(exception, code)

Value:

```
catch (const std::exception& e) {            \
  notify_error(code, e.what()); \
  return code; \
}
```

Definition at line 138 of file ppl_c_implementation_common.defs.hh.

11.6.1.3 #define DECLARE_CONVERSIONS(Type, CPP_Type)

Definition at line 169 of file ppl_c_implementation_common.defs.hh.

11.6.1.4 #define DEFINE_ASCII_DUMP_FUNCTIONS(Type)

Definition at line 229 of file ppl_c_implementation_common.defs.hh.

11.6.1.5 #define DEFINE_ASCII_DUMP_LOAD_FUNCTIONS(Type)

Value:

```
DEFINE_ASCII_DUMP_FUNCTIONS(Type)             \
  DEFINE_ASCII_LOAD_FUNCTIONS(Type)
```

Definition at line 252 of file ppl_c_implementation_common.defs.hh.

11.6.1.6 #define DEFINE_ASCII_LOAD_FUNCTIONS(Type)

Definition at line 241 of file ppl_c_implementation_common.defs.hh.

11.6.1.7 #define DEFINE_OUTPUT_FUNCTIONS(Type)

Value:

```
DEFINE_PRINT_FUNCTIONS(Type)                  \
  DEFINE_ASCII_DUMP_LOAD_FUNCTIONS(Type)
```

Definition at line 256 of file ppl_c_implementation_common.defs.hh.

11.6.1.8 #define DEFINE_PRINT_FUNCTIONS(Type)

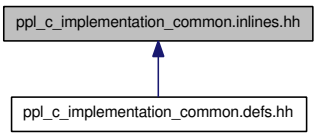
Definition at line 190 of file ppl_c_implementation_common.defs.hh.

11.6.1.9 #define PPL_NO_AUTOMATIC_INITIALIZATION

Definition at line 27 of file ppl_c_implementation_common.defs.hh.

11.7 ppl_c_implementation_common.inlines.hh File Reference

This graph shows which files directly or indirectly include this file:



Namespaces

- namespace Parma_Polyhedra_Library
- namespace Parma_Polyhedra_Library::Interfaces
- namespace Parma_Polyhedra_Library::Interfaces::C

Typedefs

- typedef Constraint_System::const_iterator Parma_Polyhedra_Library::Interfaces::C::Constraint_System_const_iterator
- typedef Generator_System::const_iterator Parma_Polyhedra_Library::Interfaces::C::Generator_System_const_iterator
- typedef Congruence_System::const_iterator Parma_Polyhedra_Library::Interfaces::C::Congruence_System_const_iterator
- typedef Grid_Generator_System::const_iterator Parma_Polyhedra_Library::Interfaces::C::Grid_Generator_System_const_iterator
- typedef PIP_Tree_Node::Artificial_Parameter Parma_Polyhedra_Library::Interfaces::C::Artificial_Parameter
- typedef PIP_Tree_Node::Artificial_Parameter_Sequence Parma_Polyhedra_Library::Interfaces::C::Artificial_Parameter_Sequence
- typedef PIP_Tree_Node::Artificial_Parameter_Sequence::const_iterator Parma_Polyhedra_Library::Interfaces::C::Artificial_Parameter_Sequence_const_iterator

Functions

- mpz_class & Parma_Polyhedra_Library::Interfaces::C::reinterpret_mpz_class (mpz_t n)

  Reinterpret an mpz_t as mpz_class.

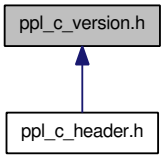
- const Coefficient * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Coefficient_t x)
- Coefficient * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Coefficient_t x)
- ppl_const_Coefficient_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Coefficient *x)
- ppl_Coefficient_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Coefficient *x)
- const Linear_Expression * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Linear_Expression_t x)
- Linear_Expression * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Linear_Expression_t x)
- ppl_const_Linear_Expression_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Linear_Expression *x)
- ppl_Linear_Expression_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Linear_Expression *x)
- const Constraint * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Constraint_t x)
- Constraint * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Constraint_t x)
- ppl_const_Constraint_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Constraint *x)
- ppl_Constraint_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Constraint *x)
- const Constraint_System * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Constraint_System_t x)
- Constraint_System * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Constraint_System_t x)
- ppl_const_Constraint_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Constraint_System *x)

- ppl_Constraint_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Constraint_System ∗x)
- const Constraint_System_const_iterator ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Constraint_System_const_iterator_t x)
- Constraint_System_const_iterator ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Constraint_System_const_iterator_t x)
- ppl_const_Constraint_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Constraint_System_const_iterator ∗x)
- ppl_Constraint_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Constraint_System_const_iterator ∗x)
- const Generator ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Generator_t x)
- Generator ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Generator_t x)
- ppl_const_Generator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Generator ∗x)
- ppl_Generator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Generator ∗x)
- const Generator_System ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Generator_System_t x)
- Generator_System ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Generator_System_t x)
- ppl_const_Generator_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Generator_System ∗x)
- ppl_Generator_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Generator_System ∗x)
- const Generator_System_const_iterator ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Generator_System_const_iterator_t x)
- Generator_System_const_iterator ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Generator_System_const_iterator_t x)
- ppl_const_Generator_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Generator_System_const_iterator ∗x)
- ppl_Generator_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Generator_System_const_iterator ∗x)
- const Congruence ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Congruence_t x)
- Congruence ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Congruence_t x)
- ppl_const_Congruence_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Congruence ∗x)
- ppl_Congruence_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Congruence ∗x)
- const Congruence_System ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Congruence_System_t x)
- Congruence_System ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Congruence_System_t x)
- ppl_const_Congruence_System_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Congruence_System ∗x)
- ppl_Congruence_System_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Congruence_System ∗x)
- const Congruence_System_const_iterator ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Congruence_System_const_iterator_t x)
- Congruence_System_const_iterator ∗ Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_Congruence_System_const_iterator_t x)
- ppl_const_Congruence_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_const (const Congruence_System_const_iterator ∗x)
- ppl_Congruence_System_const_iterator_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (Congruence_System_const_iterator ∗x)
- const Grid_Generator ∗ Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_Grid_Generator_t x)

- const PIP_Problem * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Problem_t x)
- PIP_Problem * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Problem_t x)
- ppl_const_PIP_Problem_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Problem *x)
- ppl_PIP_Problem_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Problem *x)
- const PIP_Tree_Node * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Tree_Node_t x)
- PIP_Tree_Node * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Tree_Node_t x)
- ppl_const_PIP_Tree_Node_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Tree_Node *x)
- ppl_PIP_Tree_Node_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Tree_Node *x)
- const PIP_Decision_Node * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Decision_Node_t x)
- PIP_Decision_Node * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Decision_Node_t x)
- ppl_const_PIP_Decision_Node_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Decision_Node *x)
- ppl_PIP_Decision_Node_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Decision_Node *x)
- const PIP_Solution_Node * Parma_Polyhedra_Library::Interfaces::C::to_const (ppl_const_PIP_Solution_Node_t x)
- PIP_Solution_Node * Parma_Polyhedra_Library::Interfaces::C::to_nonconst (ppl_PIP_Solution_Node_t x)
- ppl_const_PIP_Solution_Node_t Parma_Polyhedra_Library::Interfaces::C::to_const (const PIP_Solution_Node *x)
- ppl_PIP_Solution_Node_t Parma_Polyhedra_Library::Interfaces::C::to_nonconst (PIP_Solution_Node *x)
- Relation_Symbol Parma_Polyhedra_Library::Interfaces::C::relation_symbol (enum ppl_enum_Constraint_Type t)
- Bounded_Integer_Type_Width Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_width (enum ppl_enum_Bounded_Integer_Type_Width w)
- Bounded_Integer_Type_Representation Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_representation (enum ppl_enum_Bounded_Integer_Type_Representation r)
- Bounded_Integer_Type_Overflow Parma_Polyhedra_Library::Interfaces::C::bounded_integer_type_overflow (enum ppl_enum_Bounded_Integer_Type_Overflow o)

11.8 ppl_c_version.h File Reference

This graph shows which files directly or indirectly include this file:



Defines

- #define PPL_VERSION "0.11.2"

  A string containing the PPL version.

- #define PPL_VERSION_MAJOR 0

  The major number of the PPL version.

- #define PPL_VERSION_MINOR 11

  The minor number of the PPL version.

- #define PPL_VERSION_REVISION 2

  The revision number of the PPL version.

- #define PPL_VERSION_BETA 0

  The beta number of the PPL version. This is zero for official releases and nonzero for development snapshots.

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