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Contain the floating point naming explosion

proposal for C2x

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The recent integration of the floating point TS has had a disastrous effect on the set of reserved identifiers in C. If C2x would go through as it currently stands about 1700 identifiers that were completely unprotected and unannounced would enter the global name space and nasty conflicts with user code would become unavoidable. There have been several attempts in history to introduce scoped identifiers to C, but we can't wait for such miracles to happen before C2x is supposed to come out. Therefore, we propose to take emergency measures and rename most of these new identifiers before they hit the public. On a complementary aspect, we propose decent names for the newly introduced floating point types.

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Note: List of identifiers in this paper will only be complete, once FP TS-3 has been integrated as Annex N.

1. INTRODUCTION

As of this writing, a list of more than 1700 identifiers, see Section 4, following no established reservation rule, have been added to C2x. Among these identifiers are very short ones, such as **dadd**, **dfma**, nanf32, **pown**, or **SNAN**, that have a relatively high probability of conflict with user space identifiers. Others, such as d64xaddd128x or **ufromfpxl** are very difficult to parse by the unprepared eye. Again others, such as the **totalorder** functions are "reserved by accident" because the **to** prefix is generally reserved for external identifiers.
Many of these identifiers are optional by implementation choices or must be explicitly requested by a "WANT" macro. Unfortunately, such mechanisms still reduce the design space for application libraries that aim to be portable. They still must avoid such identifiers, because they don't know the settings in which their users will compile or link their library.

Making identifiers optional does not ensure portability.

Such a long list of new names has some risk of conflict with existing code bases. Let us *e.g* assume that the probability p for conflict for each of these identifiers is one in a million for a particular source file. Assuming independence, the overall probability for all identifiers combined to have a conflict in a random source file would then be

$$1 - (1 - p)^{1700} = 1 - (1 - 10^{-6})^{1700} \approx 0.17\%$$

For large projects that are composed of many TU, this means that there is a relatively high probability of conflict. Such conflicts are not easy to detect because they may only manifest on platforms that are not accessible to the developer, maybe years after the code is written.

In contrast to that excessive intrusion into the user name space for the library, we then are shy to introduce properly usable names for the new features that really matter, namely the new floating point types. These are hidden behind new keywords and **typedef** (in Annex N) that use the impractical (and ugly) underscore-capital convention.

But, what is much worse that these discussions about probability of naming conflicts or other technical aspects, this careless addition of 1700 crude identifiers sends a very bad signal to our user base. Basically it says that we are willing to step on the feet of millions of C programmers and impact their everyday life for the next 30 years, because we, some dozen of implementers and language designers were not able to come up with a better naming scheme.

The C community deserves better than this.

After the year-long acceptance problem of C99 by a large part of the C community, we have regained trust with C11 and C17. Let's not jeopardize this lightly by throwing 1700 identifiers for mostly marginal features in the face of our users.

1.1. Problem analysis

The addition of this abundance of identifiers mainly to the library is due to multiple factors, of which the principal are:

- The addition of the optional decimal floating point types and of the types of Annex N. For each existing (or added) functionality twelve additional new identifiers with suffixes

d128x	d32	d64	f128	f32x	f64x
d128	d64x	f128x	f16	f32	f64

  are potentially added to <math.h>. Together with the already established suffixes f for **float** and l for **long double**, this means that for practically every <math.h> feature there may be fifteen functions (and linker symbols) and one macro in <tgmath.h>.
- For new functionalities, variants for **float** (suffix f) and **long double** (suffix l) are added systematically.
- In an attempt to reserve identifiers for future use, a non-functional set of identifiers starting with cr (for correct rounding) have been added to the future library directions. This convention is not even fit for internal use, because it is ambiguous, namely for the identifier **crsqrt** could be derived from **sqrt** (with a cr prefix) or from **rsqrt** (with a c prefix).
- Naming conventions are newly introduced (prefix from), instead of using established schemes to which users are accustomed and that are reserved to some extent by the standard (prefix **to**).
- Complicated naming conventions that depend of two types have been added, *e.g* **d64muld128**, that use prefix and postfix notations.
- The addition of features with prefix FENV_ or suffix **_WIDTH**.

Another aspect of all of this history of integration is that the mechanisms of C that are intended to guide users which identifiers might be used in future versions has failed badly for <math.h>. This is due to the fact that there are no established rules how identifiers would be added here.

Each header should have a set of established rules for identifier addition.

Generally, these rules should be expressed as easy-to-summarize prefix or suffix rules.

Finally, new keywords should only be introduced into the language for features that cannot be expressed syntactically, yet. In particular, new types are easily expressible in existing syntax, and so there should never be new keywords for types.

New types should use reserved identifiers, not keywords.

We already have an implicit rule for type names (suffix **_t**) we just have to establish it rigorously.

1.2. A simple way out (for WG14)

Seen all this inadequate handling of naming issues (introducing more than a thousand new linker symbols while weirdly reserving some dozens, completely marginal features, for future use) convinces me that the integration of at least part of the FP TS should be reconsidered. In its abundance of new names FP TS-3 is by far the worst, so I think the best and easiest for WG14 as a whole would be to send this back to the FP group.
We should not do this without giving the FP group directions about which (if any) other paths would be more promising and may have chances to be accepted by WG14.
The major problem of these interfaces is not the addition of names in some headers, it is the massive addition of symbols with external linkage that step on the feet of our users. Therefore, I think the primary goal should be a solution that seeks to minimize that effect. To my opinion, the best way forward would twofold:

(1) Add new derived features (variant `fXXX` of function `f` for new type `XXX`) **only** through the type-generic macros.
(2) Hide all additions of special types, in particular decimal floating point in specialized headers.

QUESTION 1. *Shall the integration of FP TS-3 into C2x be revoked?*

QUESTION 2. *Shall the integration of the FP TS be done that they are strongly backwards compatible, that is that they don't introduce new symbols in the user realm at any level (functions, macros, external linkage) unless the application source code requires it explicitly?*

QUESTION 3. *Shall all new additions of specialized interfaces for specialized floating point types be done via type-generic macros without introducing external symbols?*

QUESTION 4. *Shall all additions of new floating types be introduced in new headers?*

2. STRATEGY – OVERVIEW

If any of the above questions are answered affirmatively, the better, but unfortunately this cannot be all and we have to reflect about general strategies how to avoid such situations in the future and on how to repair C2x-current such that C2x-final will be acceptable by large parts of our user base. The following is based on a worst-case scenario where none of the strategies reflected in the questions above finds consensus. If otherwise, what is presented below would have to be adapted accordingly.
By a series of replacements and prefix or suffix reservations we try to get rid of most of the newly reserved identifiers, and replace them by more systematic choices that are easier to deal with. We introduce *a posteriori* rules that would have reserved these identifiers if they had been introduced in time.

This paper only talks about identifiers that are introduced for C2x.

If consequently there would be interest in renaming some C17 features, a different paper would have to be written.
In the following, we will use the following abbreviations for the corresponding types:

abbreviation	type
`flt`	**`float`**
`dbl`	**`double`**
`ldbl`	**`long double`**
`dec[0-9]+x?`	`_Decimal`N`x?`
`flt[0-9]+x?`	`_Float`N`x?`
`int`	any signed integer type
`uint`	any unsigned integer type

2.1. A first layer of changes

If in a first pass we proceed as follows:

- Reserve the **`_t`** suffix for types (language and library).
- Reserve the **`_WIDTH`** suffix.
- Reserve the prefixes `DEC[0-9]+x?_` and `FLT[0-9]+x?_`.
- Reserve the prefixes `dec[0-9]+x?_`, `flt[0-9]+x?_`, `flt_`, and `ldbl_`.
- Transform all `f`, `l`, `d[0-9]+x?`, `f[0-9]+x?` suffixes into the appropriate prefixes.
- Remove the new `cr` identifiers.

We remain with a list of new main features that would be introduced by C2x:

acosf16	d128sub	f32mul	fmaxf16	**pown**
acoshf16	**d32add**	f32sqrt	**fmaxmag**	pownf16
acospi	**d32div**	f32sub	fmaxmagf16	**powr**
acospif16	**d32fma**	f32xadd	fminf16	powrf16
asinf16	**d32mul**	f32xdiv	**fminmag**	**quantize**
asinhf16	**d32sqrt**	f32xfma	fminmagf16	quantizef16
asinpi	**d32sub**	f32xmul	fmodf16	**quantum**
asinpif16	**d64add**	f32xsqrt	**fmul**	quantumf16
atan2pi	**d64div**	f32xsub	frexpf16	remainderf16
atanf16	**d64fma**	f64add	**fromfp**	rintf16
atanhf16	**d64mul**	f64div	fromfpf16	**rootn**
atanpi	**d64sqrt**	f64fma	**fromfpx**	rootnf16
atanpif16	**d64sub**	f64mul	fromfpxf16	**roundeven**
cacospi	d64xadd	f64sqrt	**fsqrt**	roundevenf16
canonicalize	d64xdiv	f64sub	**fsub**	roundf16
canonicalizef16	d64xfma	f64xadd	**getpayload**	**rsqrt**
casinpi	d64xmul	f64xdiv	getpayloadf16	rsqrtf16
catanpi	d64xsqrt	f64xfma	HUGE_VAL_F16	**samequantum**
cbrtf16	d64xsub	f64xmul	hypotf16	samequantumf16
ccompoundn	**dadd**	f64xsqrt	ilogbf16	scalblnf16
ccospi	**ddiv**	f64xsub	ldexpf16	scalbnf16
ceilf16	**deprecated**	fabsf16	lgammaf16	**setpayload**
cexp10	**dfma**	**fadd**	**llogb**	setpayloadf16
cexp10m1	**dmul**	fdimf16	llogbf16	**setpayloadsig**
cexp2m1	**dsqrt**	**fdiv**	**llquantexp**	setpayloadsigf16
clog10p1	**dsub**	**fe_dec_getround**	llquantexpf16	sinf16
clog2p1	erfcf16	**fe_dec_setround**	llrintf16	sinhf16
clogp1	erff16	**fegetmode**	llroundf16	**sinpi**
compoundn	**exp10**	**FENV_DEC_ROUND**	**log10p1**	sinpif16
compoundnf16	**exp10m1**	**FENV_ROUND**	**log2p1**	**SNAN**
copysignf16	**exp2m1**	**fesetexcept**	logbf16	SNANF16
cosf16	expf16	**fesetmode**	logf16	sqrtf16
coshf16	f128add	**fetestexceptflag**	**logp1**	tanf16
cospi	f128div	**ffma**	lrintf16	tanhf16
cospif16	f128fma	floorf16	lroundf16	**tanpi**
cpown	f128mul	FLT16_DECIMAL_DIG	**maybe_unused**	tanpif16
cpowr	f128sqrt	FLT16_DIG	modff16	tgammaf16
CR_DECIMAL_DIG	f128sub	FLT16_EPSILON	nanf16	truncf16
crrsqrt	f16add	FLT16_MANT_DIG	nearbyintf16	**ufromfp**
crsqrt	f16div	FLT16_MAX	nextafterf16	ufromfpf16
csinpi	f16fma	FLT16_MAX_10_EXP	**nextdown**	**ufromfpx**
ctanpi	f16mul	FLT16_MAX_EXP	nextdownf16	ufromfpxf16
d128add	f16sqrt	FLT16_MIN	nexttowardf16	
d128div	f16sub	FLT16_MIN_10_EXP	**nextup**	
d128fma	f32add	FLT16_MIN_EXP	nextupf16	
d128mul	f32div	FLT16_TRUE_MIN	**nodiscard**	
d128sqrt	f32fma	fmaf16	powf16	

This looks already a bit easier to handle. But still this has a lot of identifiers that are not even active and a lot that would profit from a more systematic approach.

2.2. A second layer of changes

A second layer is more targeted to correct specific naming problems:

- Introduce some more systematic reservations:
  - Reserve the `fe_` prefix for `<fenv.h>`.
  - Reserve the **`to`** prefix for `<math.h>`.
  - Change the `c` "prefix" for future complex functions to `cmplx_`.
- For the operations that convert to a narrower type, change the `f`, `d`, `d[0-9]+x?`, and `f[0-9]+x?` prefixes to already reserved prefixes `toflt_`, `todbl_`, `todec[0-9]+x?_`, and `toflt[0-9]+x?_`, respectively.
- Rename some of the remaining features:
  - Change the names of the decimal floating types to `dec32_t`, `dec64_t` and `dec128_t`.
  - Change the names of the interchange floating types (Annex N) to `flt32_t`, `flt64_t` and `flt128_t`.
  - Change the names of the extended floating types (Annex N) to `flt32x_t`, `flt64x_t`, `flt128x_t`, `dec64x_t`, and `dec128x_t`.
  - Change the names of the evaluation floating types (Annex N) to `flt32_eval_t`, `flt64_eval_t`, `flt128_eval_t`, `dec32_eval_t`, `dec64_eval_t`, and `dec128_eval_t`.
  - Change the `FENV_` prefix to a **`FE_`** prefix.
  - Rename the new `<fenv.h>` features starting with `fe` to `fe_`.
  - Change `(u)?fromfp(x)?` identifiers to **`to`**`(u)?`**`int`**`(x)?`
  - Change **`llogb`** to `toint_logb`.
  - Change **`llquantexp`** to `toint_quantexp`.
  - Change `SNANXXX` to `PREFIX_SNAN`.
  - Change **`CR_DECIMAL_DIG`** to `FP_DECIMAL_DIG`.
  - Change `HUGE_VAL_XXX` to `XXX_HUGE_VAL`.

The remaining list of non-systematic identifiers for new main features is then:

acospi	CMPLXF64	**exp10**	**maybe_unused**	**roundeven**
asinpi	CMPLXF64X	**exp10m1**	**nextdown**	**rsqrt**
atan2pi	**compoundn**	**exp2m1**	**nextup**	**samequantum**
atanpi	**cospi**	**fmaxmag**	**nodiscard**	**setpayload**
canonicalize	**decodebin**	**fminmag**	**pown**	**setpayloadsig**
CMPLXF128	**decodedec**	**getpayload**	**powr**	**sinpi**
CMPLXF128X	**deprecated**	**log10p1**	**quantize**	**tanpi**
CMPLXF32	**encodebin**	**log2p1**	**quantum**	
CMPLXF32X	**encodedec**	**logp1**	**rootn**	

These names of (new) features are those that users should memorize. By using type generic macros for the remaining floating point features, where possible, they might entirely avoid any complicated composed identifiers.
We obtain the following list of systematically reserved identifiers for the other new features:

DBL_SNAN	todbl_add	todec64x_fma	toflt32x_sqrt
dec128_t	todbl_div	todec64x_mul	toflt32x_sub
dec128x_t	todbl_fma	todec64x_sqrt	toflt64_add
dec32_t	todbl_mul	todec64x_sub	toflt64_div
dec32x_t	todbl_sqrt	toflt128_add	toflt64_fma
dec64_t	todbl_sub	toflt128_div	toflt64_mul
dec64x_t	todec128_add	toflt128_fma	toflt64_sqrt
decimal128_t	todec128_div	toflt128_mul	toflt64_sub
decimal32_t	todec128_fma	toflt128_sqrt	toflt64x_add
decimal64_t	todec128_mul	toflt128_sub	toflt64x_div
FE_DEC_ROUND	todec128_sqrt	toflt16_add	toflt64x_fma
fe_getmode	todec128_sub	toflt16_div	toflt64x_mul
FE_ROUND	todec32_add	toflt16_fma	toflt64x_sqrt
fe_setexcept	todec32_div	toflt16_mul	toflt64x_sub
fe_setmode	todec32_fma	toflt16_sqrt	toflt_add
fe_testexceptflag	todec32_mul	toflt16_sub	toflt_div
float128_t	todec32_sqrt	toflt32_add	toflt_fma
float32_t	todec32_sub	toflt32_div	toflt_mul
float64_t	todec64_add	toflt32_fma	toflt_sqrt
flt128_t	todec64_div	toflt32_mul	toflt_sub
flt128x_t	todec64_fma	toflt32_sqrt	toint
flt32_t	todec64_mul	toflt32_sub	toint_logb
flt32x_t	todec64_sqrt	toflt32x_add	toint_quantexp
flt64_t	todec64_sub	toflt32x_div	tointx
flt64x_t	todec64x_add	toflt32x_fma	touint
FP_DECIMAL_DIG	todec64x_div	toflt32x_mul	touintx

With changed rules for reserved identifiers, the following additions to C2x remain as these are, but these are then reserved identifiers:

CHAR_WIDTH	FLT128_MANT_DIG	FLT16_EPSILON	FLT32X_DIG
DEC128X_EPSILON	FLT128_MAX	FLT16_MANT_DIG	FLT32X_EPSILON
DEC128X_MANT_DIG	FLT128_MAX_10_EXP	FLT16_MAX	FLT32X_MANT_DIG
DEC128X_MAX	FLT128_MAX_EXP	FLT16_MAX_10_EXP	FLT32X_MAX
DEC128X_MAX_EXP	FLT128_MIN	FLT16_MAX_EXP	FLT32X_MAX_10_EXP
DEC128X_MIN	FLT128_MIN_10_EXP	FLT16_MIN	FLT32X_MAX_EXP
DEC128X_MIN_EXP	FLT128_MIN_EXP	FLT16_MIN_10_EXP	FLT32X_MIN
DEC128X_TRUE_MIN	FLT128_TRUE_MIN	FLT16_MIN_EXP	FLT32X_MIN_10_EXP
DEC64X_EPSILON	FLT128X_DECIMAL_DIG	FLT16_TRUE_MIN	FLT32X_MIN_EXP
DEC64X_MANT_DIG	FLT128X_DIG	FLT32_DECIMAL_DIG	FLT32X_TRUE_MIN
DEC64X_MAX	FLT128X_EPSILON	FLT32_DIG	FLT64_DECIMAL_DIG
DEC64X_MAX_EXP	FLT128X_MANT_DIG	FLT32_EPSILON	FLT64_DIG
DEC64X_MIN	FLT128X_MAX	FLT32_MANT_DIG	FLT64_EPSILON
DEC64X_MIN_EXP	FLT128X_MAX_10_EXP	FLT32_MAX	FLT64_MANT_DIG
DEC64X_TRUE_MIN	FLT128X_MAX_EXP	FLT32_MAX_10_EXP	FLT64_MAX
fe_dec_getround	FLT128X_MIN	FLT32_MAX_EXP	FLT64_MAX_10_EXP
fe_dec_setround	FLT128X_MIN_10_EXP	FLT32_MIN	FLT64_MAX_EXP
femode_t	FLT128X_MIN_EXP	FLT32_MIN_10_EXP	FLT64_MIN
FLT128_DECIMAL_DIG	FLT128X_TRUE_MIN	FLT32_MIN_EXP	FLT64_MIN_10_EXP
FLT128_DIG	FLT16_DECIMAL_DIG	FLT32_TRUE_MIN	FLT64_MIN_EXP
FLT128_EPSILON	FLT16_DIG	FLT32X_DECIMAL_DIG	FLT64_TRUE_MIN

FLT64X_DECIMAL_DIG	FLT64X_MAX_EXP	long_double_t	UCHAR_WIDTH
FLT64X_DIG	FLT64X_MIN	LONG_WIDTH	ULLONG_WIDTH
FLT64X_EPSILON	FLT64X_MIN_10_EXP	PTRDIFF_WIDTH	ULONG_WIDTH
FLT64X_MANT_DIG	FLT64X_MIN_EXP	SCHAR_WIDTH	USHRT_WIDTH
FLT64X_MAX	FLT64X_TRUE_MIN	SHRT_WIDTH	WCHAR_WIDTH
FLT64X_MAX_10_EXP	LLONG_WIDTH	SIZE_WIDTH	WINT_WIDTH

3. PROPOSED CHANGES

In the following we will run the details of our strategy and formulate questions to WG14 that can be used by them to cherry-pick those parts that seem to be suitable. For that we will generally assume the following:

- Systematic name reservations (prefix or suffix) are better than black lists of individual identifiers.
- Prefix or suffix rules that are already active for one normative context can be extended relatively easy to another normative context.
- Before being published in ISO 9899 for the first time, features can be renamed.
- New types don't need keywords, identifiers do fine.

3.1. Reserve the `_t` suffix for standard types

ISO 9945 (POSIX) already reserves the `_t` suffix for types (**typedef**) in the whole library section. This is in sync with the usage in the C standard, so we think that is time to integrate that rule.

Add to 6.11 (Future language directions, general part)

> Identifiers ending in `_t` may be added to represent types in any of the clauses of this document.

Add to 7.31 (Future library directions, general part)

> Identifiers ending in `_t` may be added to represent **typedef** names in any of the library headers.

Adding these rules, would already reserve the **femode_t** and `long_double_t` identifiers.

QUESTION 5. *Shall we add a general reservation for* `_t` *suffixed names to C2x as proposed in N2426?*

3.2. Reserve the `_WIDTH` suffix

The `_WIDTH` suffix is now systematically used for the width of integer types. These are needed in `<math.h>` for the `(u)?fromfp(x)?` functions (renamed to `to(u)?int(x)?` below) and later for the two's complement changes for integers.

We should reserve it for the use in `<stdint.h>`. Currently, it is already reserved for those macros that start with `(U)?INT`, but it would probably be better to just reserve that suffix completely.

Add to 7.31.12 p1

> Macro names ending with `_WIDTH` may be added to the macros defined in the `<stdint.h>` header.

QUESTION 6. *Shall C2x reserve the future use of the* `_WIDTH` *suffix to macros in* `<stdint.h>` *as given in N2426?*

3.3. Reserve the prefixes DEC[0-9]+X?_ and FLT[0-9]+X?_

There are features that have been added to <math.h> that follow some naming scheme, but which had not previously reserved. The addition of the corresponding types and macros may happen "on the fly" when implementations add support for new optional floating types to their C libraries. Therefore we propose to add a scheme of new prefixes to <math.h>, one for each floating type.
Add to 7.31.12

> External symbols starting with DEC or FLT followed by a sequence of digits, optionally followed by the letter X, then followed by an underscore and an uppercase letter may be added to the <math.h> header.

Question 7. *Shall C2x reserve the future use of prefixes of the forms* DEC[0-9]+X?_ *and* FLT[0-9]+X?_ *for* <math.h> *as given in N2426?*

3.4. Reserve the prefixes dec[0-9]+x?_, flt[0-9]+x?_, flt_ and ldbl_

To be able add new features to <math.h>, we will need some naming schemes that are

- regular (description by prefixes or suffixes)
- at least as expressive as the current implicit conventions

Therefore we propose to introduce several new prefixes to <math.h>, one for each floating type.
Add to 7.31.12

> External symbols starting with ldbl_ or flt_ followed by a lowercase letter may be added to the <math.h> header. External symbols starting with dec or flt followed by a sequence of digits, optionally followed by the letter x, then followed by an underscore and a lowercase letter may be added to the <math.h> header.

Question 8. *Shall C2x reserve the future use of prefixes of the forms* dec[0-9]+x?_, flt[0-9]+x?_, flt_ *and* ldbl_ *for* <math.h> *as given in N2426?*

3.5. Replace d[0-9]+x? suffixes by dec[0-9]+x?_ prefixes

Having reserved these prefixes, it is easy to systematically replace all functions for decimal floating point that currently are foreseen with a d[0-9]+x? suffix (the x variant is for the types introduced in Annex N) by one with the corresponding dec[0-9]+x?_ prefix.

> *In the whole document: modify identifier variants added for C2x that end with a* d*, followed by a sequence of digits, optionally followed by an* x*, by removing that suffix and by prefixing them with* dec *the same sequence of digits and optional* x *and then by an underscore.*

For final lists (after application of all changes) of such identifiers see Section 5, below.

Question 9. *Shall the identifiers that are new for C2x that have a* d[0-9]+x? *suffix be replaced by identifiers using* dec[0-9]+x?_ *as given in N2426?*

3.6. Replace f and l suffixes by flt_ and ldbl_ prefixes

Because of the use of just one character as a discriminator, it is a bit more difficult to systematically replace all functions for standard floating point that currently are foreseen with a f or l suffix by one with the corresponding flt_ and ldbl_ prefix. This has to be done with some care, because in particular the l suffix can also be used for **long**, *e.g.*
In the whole document:

- Modify identifier variants added for C2x that end in `f` (for **`float`**) by removing the `f` suffix and adding a `flt_` prefix.
- Modify identifier variants added for C2x that end in `l` (*ell*, for **`long double`**) by removing the `l` suffix and adding a `ldbl_` prefix.

For final lists (after application of all changes) of such identifiers see Section 5, below.

QUESTION 10. *Shall the identifiers that are new for C2x that have a `f` or `l` suffix (for* **`float`** *or* **`long double`***) be replaced by identifiers using `flt_` and `ldbl_` prefixes, respectively, as given in N2426?*

3.7. Replace `f[0-9]+x?` suffixes by `flt[0-9]+x?_` prefixes

Annex N also adds similar functions with `f[0-9]+x?` suffixes.

> *In Annex N: modify identifier variants added for C2x that end with a `f`, followed by a sequence of digits, optionally followed by an `x`, by removing that suffix and by prefixing them with `flt` the same sequence of digits and optional `x` and then by an underscore.*

For the final list (after application of all changes) of such identifiers see Section 5, below.

QUESTION 11. *Shall the identifiers in Annex N that are new for C2x that have a `f[0-9]+x?` suffix be replaced by identifiers using the `flt[0-9]+x?_` prefix as given in N2426?*

3.8. Remove the reservation for the `cr` "prefix"

The new naming convention that reserves a `cr` prefix for "correct rounding" to 7.31.8 is not very viable, because it is in direct conflict with the addition of complex functions with a `c` prefix to `<complex.h>` in 7.31.1. In particular the identifier **`crsqrt`** has two possible derivations, namely as complex variant of **`rsqrt`** or as correct rounding variant of **`sqrt`**. In any case, a "some letters" prefix or postfix is not something that will reduce the problem much for future extensions, only systematic reservation will help.
Therefore we think that this paragraph should just be removed. The tools that we propose give enough leeway for future proposals to come up with naming conventions for such whole sets of features.

> *Remove 7.31.8 p4 (Future library directions for `<math.h>`)*

QUESTION 12. *Shall 7.31.8 p4 be removed from C2x as proposed in N2426?*

3.9. Reserve more prefixes and suffixes

Many prefixes or suffixes are already present in other parts of the C standard or in other standards (as ISO 9945). Since code that is sought to be portable has to avoid them anyhow, it is much easier to add them as general rules to new parts. In particular, prefixes that are reserved for used for external symbols in any of the headers should not be used by any application.

3.9.1. Reserve the `fe_` prefix for `<fenv.h>`

The `<fenv.h>` header follows unfortunate naming conventions that are incomplete and not very consistent. In particular, it uses `fe` (without underscore), `fe_` (with underscore), **`FE_`** and `FENV_`. Among these, only **`FE_`** is systematically reserved.
We propose to add a `fe_` prefix to the list:
Add to 7.31.4 (Future library directions for `<fenv.h>`)

> External symbols starting with `fe_` may be added to the `<fenv.h>` header.

QUESTION 13. *Shall we add a general reservation for* `fe_` *prefixed names for* `<fenv.h>` *to C2x as proposed in N2426?*

3.9.2. Reserve the `to` prefix for `<math.h>`

Strictly speaking, the **to** prefix is already prohibited for the use by applications for external symbols, since it it is reserved for the `<ctype.h>` header. Nevertheless, the lists in 7.31 also serve to inform users what they might expect, so we propose to add the **to** prefix also to `<math.h>`:

Add **to** *to the reserved prefixes in 7.31.8 p3.*

QUESTION 14. *Shall we add a general reservation for* **to** *prefixed names to C2x to* `<math.h>` *as proposed in N2426?*

3.9.3. Change the prefix for new complex functions to `cmplx_`

The `<complex.h>` header follows unfortunate naming conventions, in particular it has functions that just add a one character prefix `c` to features provided by *math.h*.
We propose to add a `cmplx_` prefix to the reservations:

Add to 7.31.4

2 External symbols starting with `cmplx_` may be added to the `<complex.h>` header.

QUESTION 15. *Shall we add a general reservation for* `cmplx_` *prefixed names for* `<complex.h>` *to C2x as proposed in N2426?*

3.9.4. Remove the `c` prefixed names from future library directions

Now that we have better tools to add functions to `<complex.h>` we may as well give up the reservation of names that we will not use, anyhow.

Remove from 7.31.4

~~The function names **cacospi** ...~~

QUESTION 16. *Shall 7.31.1 p1 be removed from C2x as proposed in N2426?*

3.10. Change the `f`, `d`, `d[0-9]+x?`, and `f[0-9]+x?` prefixes for functions rounding to narrower type

The functions for operations with rounding to narrower type that are introduced in C2x currently, use very short prefixes to indicate the type **to** which they round. This convention that has plenty of conflicts with identifiers with other purpose. In particular, a `f` as first letter is often used throughout.
We propose to use the prefixes with **to** as these are already reserved anyhow. This gives us the new prefixes `toflt_`, `todbl_`, `todec[0-9]+x?_`, and `toflt[0-9]+x?_`, respectively, for these operations. Typical renaming, if the all changes from above are applied, would then be

before	`<math.h>`	`<tgmath.h>`
ffma	toflt_fma	toflt_fma
dfmal	ldbl_todbl_fma	todbl_fma
faddl	ldbl_toflt_add	toflt_add
d32addd64	dec64_todec32_add	todec32_add
d64sqrtd128	dec128_todec64_sqrt	todec64_sqrt

So this leads to longer identifiers for the specialized features, but their compositions is much clearer. *E.g.* `dec128_todec64_sqrt` makes it immediately clear that this is about a square-root function that takes **`_Decimal128`** and returns **`_Decimal64`**.

> *Before performing any renamings as proposed above, in 7.12.14 and in the corresponding clauses in Annex N, rewrite the newly introduced names by replacing prefixes* `f`*,* `d`*,* `d[0-9]+x?`*, and* `f[0-9]+x` *by* `toflt_`*,* `todbl_`*,* `todec[0-9]+x?_`*, and* `toflt[0-9]+x?_`*, respectively.*
>
> *Use these new names as replacement for the old ones throughout the whole document.*

QUESTION 17. *Shall the functions that round result to narrower type (7.12.14 and Annex N) be renamed as indicated in N2426?*

3.11. Rename some of the remaining features

After we have tackled the naming of identifiers that observe some systematic pattern, some unfortunate choices for other singular identifiers remain, for which we can easily adapt changes that have them fit better to the general requirements.

3.11.1. Rename the new floating point types

Introducing new types into C does not need syntax, therefore the introduction of keywords for the new floating point types is just overkill. We propose to remove the new keywords and to use **`_t`** suffixed identifiers instead (which we reserved above).

previous name	new name
`_Decimal`N	`dec`N**`_t`**
`_Float`N	`flt`N**`_t`**
`_Decimal`N`x`	`dec`N`x_t`
`_Float`N`x`	`flt`N`x_t`
`_Decimal`N**`_t`**	`dec`N`_eval_t`
`_Float`N**`_t`**	`flt`N`_eval_t`

The replacement in the main clauses is relatively straight forward. Unfortunately, Annex N complicates the view a little bit.

- *In 6.2.6 (Representations of types), forward references, add "Predefined identifiers (6.4.2.2)"*
- *Remove the keywords* **`_Decimal32`**, **`_Decimal64`**, **`_Decimal128`** *from the list of keywords in 6.4.1*
- *Add the following setence as a new paragraph to 6.4.2.2 (Predefined Identifiers):*

  > If the implementation supports decimal floating types, for each existing type with a width of `N` bits, the identifier or the form `dec`N**`_t`** is implicitly declared to refer to this type as if by a **`typedef`** that precedes the program text.

- *In Annex N replace* **`_Decimal32_t`**, **`_Decimal64_t`**, `_Decimal128_t` *by* `dec32_eval_t`, `dec64_eval_t` *and* `dec128_eval_t`, *respectively*
- *In Annex N replace* `_Float32_t`, `_Float64_t` *by* `flt32_eval_t`, *and* `flt64_eval_t`, *respectively*
- *Elsewhere in the whole document replace* **`_Decimal32`**, **`_Decimal64`**, **`_Decimal128`** *by* `dec32_t`, `dec64_t` *and* `dec128_t`, *respectively*

- *Replace clause N.5.1 (Keywords) by*

> **N.5.1 Predefined identifiers**
> This subclause expands the set of predefined identifiers (6.4.2.2) to also include:
> – `flt`*N*`_t`, where *N* is 16 or a positive multiple of 32
> – `flt32x_t`
> – `flt64x_t`
> – `flt128x_t`
> – `dec`*N*`_t`, where `N` is a positive multiple of 32
> – `dec64x_t`
> – `dec128x_t`
> Such identifiers are implicitly declared as if by a **`typedef`** that precedes the program text.

- *Remove the decimal floating types from 6.7.2 (Type specifiers)*
- *Remove clause N.7 (Declarations)*
- *Elsewhere in Annex N replace* `_Decimal`*N*, `_Decimal`*N*`x`, `_Float`*N*, `_Float`*N*`x`, *by* `dec`*N*`_t`, `dec`*N*`x_t`, `flt`*N*`_t`, `flt`*N*`x_t`, *respectively*

This change would not have much impact on implementations that already implement these types with the old keywords (as extension to C17) as the old keywords remain available for implementations.

Question 18. *Shall we rename the new floating types for C2x as indicated in N2426?*

If WG14 instead prefers to push the whole issue of type names for the decimal floating point types to the library section, an alternative approach of integration into `<math.h>` (or a new header?) could be proposed. But this would require a bit more work and a new proposal.

3.11.2. Change the `FENV_` prefix to a `FE_` prefix.

Up to now, the `FENV_` prefix was only used once, for the **`FENV_ACCESS`** pragma. This particular choice was and is quite unfortunate, because `<fenv.h>` explicitly reserves the **`FE_`** prefix. The collision between pragmas and macros is probably rare; when occurring directly in a **`#pragma STDC`** no macro expansion is performed. Nevertheless, macro expansion can occur for the preparation of a **`_Pragma`** operator, so the possibility of conflict remains.
The integration of the FP TS brought us two new pragmas, **`FENV_ROUND`** and **`FENV_DEC_ROUND`**. Other than wanting to be consistent with the choice for **`FENV_ACCESS`** there is no reason to have a `FENV_` prefix here. A **`FE_`** prefix would do equally well.

Question 19. *Shall we rename the pragmas* **`FENV_ROUND`** *and* **`FENV_DEC_ROUND`** *to* `FE_ROUND` *and* `FE_DEC_ROUND` *for C2x as indicated in N2426?*

3.11.3. Rename the new `<fenv.h>` features starting with `fe` to `fe_`

There are several new features introduced to `<fenv.h>`, and most of them have names that start with `fe`, but are not followed by an underscore. Prefix rules without an underscore separations are particular difficult to follow, they would exclude all English words starting with "fe" from the user's name space. We think that there is not much reason to have such names for newly introduced identifiers in the first place. Using `fe_` would do just as well.

> *For all newly introduced features in* `<fenv.h>`*, replace an initial* `fe` *that is not followed by an underscore by* `fe_`*.*

Question 20. *Shall we change newly introduced features for C2x in* `<fenv.h>`*, such that we replace an initial* `fe` *that is not followed by an underscore by* `fe_` *as indicated in N2426?*

3.11.4. Change (u)?fromfp(x)? identifiers to to(u)?int(x)?

The prefix or name component from has not been used previously in the C standard, and these new identifiers do not follow any establish logic for new names. In addition, their real purpose (rounding to integer) is not apparent in the name at all. We propose to simply rename these features as in the following table.

	proposed replacement	
fromfp	toint	
ufromfp	touint	
fromfpx	tointx	
ufromfpx	touintx	
	without prefix rules	with prefix rules
fromfpd*N*	tointd*N*	dec*N*_toint
fromfpd*N*x	tointd*N*x	dec*N*x_toint
fromfpf	tointf	flt_toint
fromfpf*N*	tointf*N*	flt*N*_toint
fromfpf*N*x	tointf*N*x	flt*N*x_toint
fromfpl	tointl	ldbl_toint
fromfpxd*N*	tointxd*N*	dec*N*_tointx
fromfpxd*N*x	tointxd*N*x	dec*N*x_tointx
fromfpxf	tointxf	flt_tointx
fromfpxf*N*	tointxf*N*	flt*N*_tointx
fromfpxf*N*x	tointxf*N*x	flt*N*x_tointx
fromfpxl	tointxl	ldbl_tointx
ufromfpd*N*	touintd*N*	dec*N*_touint
ufromfpd*N*x	touintd*N*x	dec*N*x_touint
ufromfpf	touintf	flt_touint
ufromfpf*N*	touintf*N*	flt*N*_touint
ufromfpf*N*x	touintf*N*x	flt*N*x_touint
ufromfpl	touintl	ldbl_touint
ufromfpxd*N*	touintxd*N*	dec*N*_touintx
ufromfpxd*N*x	touintxd*N*x	dec*N*x_touintx
ufromfpxf	touintxf	flt_touintx
ufromfpxf*N*	touintxf*N*	flt*N*_touintx
ufromfpxf*N*x	touintxf*N*x	flt*N*x_touintx
ufromfpxl	touintxl	ldbl_touintx

The names and prefixes toint and touint have the advantage of being previously reserved (as they start with **to**) and that they reflect the purpose of the feature.

QUESTION 21. *Shall we rename the* (u)?**fromfp**(x)? *functions as indicated in N2426?*

3.11.5. Change llogb to toint_logb

The **llogb** functions differ from the previously known **ilogb** functions in their return type, which is **long**. But the naming is trespassing into the user name space for no good reason. Also, this function name does not really indicate the purpose, namely condensing an operation and a conversion.

	proposed replacement
FP_LLOGB0	FP_TOINT_LOGB0
FP_LLOGBNAN	FP_TOINT_LOGBNAN
llogb	toint_logb

	without prefix rules	with prefix rules
llogbf	toint_logbf	flt_toint_logb
llogbl	toint_logbl	ldbl_toint_logb
llogbd*N*	toint_logbd*N*	dec*N*_toint_logb
llogbd*N*x	toint_logbd*N*x	dec*N*x_toint_logb
llogbf*N*	toint_logbf*N*	flt*N*_toint_logb
llogbf*N*x	toint_logbf*N*x	flt*N*x_toint_logb

Again we think that a prefix toint would much better reflect that feature. Also note that it is not expected that other functions along the line with even wider return type will be added to the C standard; 31 bit are considered wide enough for that. So the return type itself (**long** versus **long long** or **intmax_t**) should not be reflected in the name.

QUESTION 22. *Shall we rename the* **llogb** *features as indicated in N2426?*

3.11.6. Change llquantexp to toint_quantexp

Similar observations as above hold for the **llquantexp** feature. We propose the following replacements:

	proposed replacement	
llquantexp	toint_quantexp	
	without prefix rules	with prefix rules
llquantexpd*N*	toint_quantexpd*N*	dec*N*_toint_quantexp
llquantexpd*N*x	toint_quantexpd*N*x	dec*N*x_toint_quantexp

The return type itself (**long long** versus **long** or **intmax_t**) should not be reflected in the name and toint as a prefix should work fine.

QUESTION 23. *Shall we rename the* **llquantexp** *features as indicated in N2426?*

3.11.7. Change SNAN macros to DBL_SNAN and similar

SNAN as a macro is particularly bad. Four letter acronyms are common and having them as macros or with an addition of just one other character as in **SNANF** or **SNANL** is searching for trouble. We propose the following replacements:

	proposed replacement
SNAN	DBL_SNAN
SNANF	FLT_SNAN
SNANL	LDBL_SNAN
SNAND*N*	DEC*N*_SNAN
SNAND*N*X	DEC*N*X_SNAN
SNANF*N*	FLT*N*_SNAN
SNANF*N*X	FLT*N*X_SNAN

QUESTION 24. *Shall we rename the* **SNAN** *features as indicated in N2426?*

3.11.8. Change CR_DECIMAL_DIG to FP_DECIMAL_DIG

The new feature **CR_DECIMAL_DIG** of Annex F does not follow any naming convention, even though the header <float.h> to which it is appended would have such conventions. This new feature macro represents a bound for the binary floating point types, therefore we use FP_DECIMAL_DIG by borrowing the **FP_** prefix from <math.h>:

	proposed replacement
CR_DECIMAL_DIG	FP_DECIMAL_DIG

QUESTION 25. *Shall we rename* **CR_DECIMAL_DIG** *to* FP_DECIMAL_DIG *as indicated in N2426?*

4. CURRENT LISTS OF NEW RESERVED IDENTIFIERS.

CHAR_WIDTH	FLT16_MAX_EXP	FLT64_MIN_EXP	acosf16	asinhf128x
CR_DECIMAL_DIG	FLT16_MAX	FLT64_MIN	acosf32x	asinhf128
DEC128X_EPSILON	FLT16_MIN_10_EXP	FLT64_TRUE_MIN	acosf32	asinhf16
DEC128X_MANT_DIG	FLT16_MIN_EXP	HUGE_VAL_D128X	acosf64x	asinhf32x
DEC128X_MAX_EXP	FLT16_MIN	**HUGE_VAL_D128**	acosf64	asinhf32
DEC128X_MAX	FLT16_TRUE_MIN	**HUGE_VAL_D32**	acoshd128x	asinhf64x
DEC128X_MIN_EXP	FLT32X_DECIMAL_DIG	HUGE_VAL_D64X	**acoshd128**	asinhf64
DEC128X_MIN		**HUGE_VAL_D64**	**acoshd32**	asinpid128x
DEC128X_TRUE_MIN	FLT32X_DIG	HUGE_VAL_F128X	acoshd64x	**asinpid128**
DEC64X_EPSILON	FLT32X_EPSILON	HUGE_VAL_F128	**acoshd64**	**asinpid32**
DEC64X_MANT_DIG	FLT32X_MANT_DIG	HUGE_VAL_F16	acoshf128x	asinpid64x
DEC64X_MAX_EXP	FLT32X_MAX_10_EXP	HUGE_VAL_F32X	acoshf128	**asinpid64**
DEC64X_MAX	FLT32X_MAX_EXP	HUGE_VAL_F32	acoshf16	asinpif128x
DEC64X_MIN_EXP	FLT32X_MAX	HUGE_VAL_F64X	acoshf32x	asinpif128
DEC64X_MIN	FLT32X_MIN_10_EXP	HUGE_VAL_F64	acoshf32	asinpif16
DEC64X_TRUE_MIN	FLT32X_MIN_EXP	**LLONG_WIDTH**	acoshf64x	asinpif32x
FENV_DEC_ROUND	FLT32X_MIN	**LONG_WIDTH**	acoshf64	asinpif32
FENV_ROUND	FLT32X_TRUE_MIN	**PTRDIFF_WIDTH**	acospid128x	asinpif64x
FLT128X_DECIMAL_DIG	FLT32_DECIMAL_DIG	**SCHAR_WIDTH**	**acospid128**	asinpif64
	FLT32_DIG	**SHRT_WIDTH**	**acospid32**	**asinpif**
FLT128X_DIG	FLT32_EPSILON	**SIZE_WIDTH**	acospid64x	**asinpil**
FLT128X_EPSILON	FLT32_MANT_DIG	SNAND128X	**acospid64**	**asinpi**
FLT128X_MANT_DIG	FLT32_MAX_10_EXP	**SNAND128**	acospif128x	atan2d128x
FLT128X_MAX_10_EXP	FLT32_MAX_EXP	**SNAND32**	acospif128	**atan2d128**
	FLT32_MAX	SNAND64X	acospif16	**atan2d32**
FLT128X_MAX_EXP	FLT32_MIN_10_EXP	**SNAND64**	acospif32x	atan2d64x
FLT128X_MAX	FLT32_MIN_EXP	SNANF128X	acospif32	**atan2d64**
FLT128X_MIN_10_EXP	FLT32_MIN	SNANF128	acospif64x	atan2f128x
	FLT32_TRUE_MIN	SNANF16	acospif64	atan2f128
FLT128X_MIN_EXP	FLT64X_DECIMAL_DIG	SNANF32X	**acospif**	atan2f32x
FLT128X_MIN		SNANF32	**acospil**	atan2f32
FLT128X_TRUE_MIN	FLT64X_DIG	SNANF64X	**acospi**	atan2f64x
FLT128_DECIMAL_DIG	FLT64X_EPSILON	SNANF64	asind128x	atan2f64
	FLT64X_MANT_DIG	**SNANF**	**asind128**	atan2pid128x
FLT128_DIG	FLT64X_MAX_10_EXP	**SNANL**	**asind32**	**atan2pid128**
FLT128_EPSILON	FLT64X_MAX_EXP	**SNAN**	asind64x	**atan2pid32**
FLT128_MANT_DIG	FLT64X_MAX	**UCHAR_WIDTH**	**asind64**	atan2pid64x
FLT128_MAX_10_EXP	FLT64X_MIN_10_EXP	**ULLONG_WIDTH**	asinf128x	**atan2pid64**
FLT128_MAX_EXP	FLT64X_MIN_EXP	**ULONG_WIDTH**	asinf128	atan2pif128x
FLT128_MAX	FLT64X_MIN	**USHRT_WIDTH**	asinf16	atan2pif128
FLT128_MIN_10_EXP	FLT64X_TRUE_MIN	**WCHAR_WIDTH**	asinf32x	atan2pif32x
FLT128_MIN_EXP	FLT64_DECIMAL_DIG	**WINT_WIDTH**	asinf32	atan2pif32
FLT128_MIN	FLT64_DIG	acosd128x	asinf64x	atan2pif64x
FLT128_TRUE_MIN	FLT64_EPSILON	**acosd128**	asinf64	atan2pif64
FLT16_DECIMAL_DIG	FLT64_MANT_DIG	**acosd32**	asinhd128x	**atan2pif**
FLT16_DIG	FLT64_MAX_10_EXP	acosd64x	**asinhd128**	**atan2pil**
FLT16_EPSILON	FLT64_MAX_EXP	**acosd64**	**asinhd32**	**atan2pi**
FLT16_MANT_DIG	FLT64_MAX	acosf128x	asinhd64x	atand128x
FLT16_MAX_10_EXP	FLT64_MIN_10_EXP	acosf128	**asinhd64**	**atand128**

atand32
atand64x
atand64
atanf128x
atanf128
atanf16
atanf32x
atanf32
atanf64x
atanf64
atanhd128x
atanhd128
atanhd32
atanhd64x
atanhd64
atanhf128x
atanhf128
atanhf16
atanhf32x
atanhf32
atanhf64x
atanhf64
atanpid128x
atanpid128
atanpid32
atanpid64x
atanpid64
atanpif128x
atanpif128
atanpif16
atanpif32x
atanpif32
atanpif64x
atanpif64
atanpif
atanpil
atanpi
CMPLXF128X
CMPLXF128
CMPLXF32X
CMPLXF32
CMPLXF64X
CMPLXF64
cabsf128x
cabsf128
cabsf32x
cabsf32
cabsf64x
cabsf64
cacosf128x
cacosf128
cacosf32x
cacosf32
cacosf64x
cacosf64
cacoshf128x
cacoshf128
cacoshf32x
cacoshf32
cacoshf64x
cacoshf64
cacospi
canonicalized128x
canonicalized128
canonicalized32
canonicalized64x
canonicalized64
canonicalizef128x
canonicalizef128
canonicalizef16
canonicalizef32x
canonicalizef32
canonicalizef64x
canonicalizef64
canonicalizef
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canonicalize
cargf128x
cargf128
cargf32x
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cargf64x
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casinf128x
casinf128
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casinf64x
casinf64
casinhf128x
casinhf128
casinhf32x
casinhf32
casinhf64x
casinhf64
casinpi
catanf128x
catanf128
catanf32x
catanf32
catanf64x
catanf64
catanhf128x
catanhf128
catanhf32x
catanhf32
catanhf64x
catanhf64
catanpi
cbrtd128x
cbrtd128
cbrtd32
cbrtd64x
cbrtd64
cbrtf128x
cbrtf128
cbrtf16
cbrtf32x
cbrtf32
cbrtf64x
cbrtf64
ccompoundn
ccosf128x
ccosf128
ccosf32x
ccosf32
ccosf64x
ccosf64
ccoshf128x
ccoshf128
ccoshf32x
ccoshf32
ccoshf64x
ccoshf64
ccospi
ceild128x
ceild128
ceild32
ceild64x
ceild64
ceilf128x
ceilf128
ceilf16
ceilf32x
ceilf32
ceilf64x
ceilf64
cexp10m1
cexp10
cexp2m1
cexpf128x
cexpf128
cexpf32x
cexpf32
cexpf64x
cexpf64
cimagf128x
cimagf128
cimagf32x
cimagf32
cimagf64x
cimagf64
clog10p1
clog2p1
clogf128x
clogf128
clogf32x
clogf32
clogf64x
clogf64
clogp1
compoundnd128x
compoundnd128
compoundnd32
compoundnd64x
compoundnd64
compoundnf128x
compoundnf128
compoundnf16
compoundnf32x
compoundnf32
compoundnf64x
compoundnf64
compoundnf
compoundnl
compoundn
conjf128x
conjf128
conjf32x
conjf32
conjf64x
conjf64
copysignd128x
copysignd128
copysignd32
copysignd64x
copysignd64
copysignf128x
copysignf128
copysignf16
copysignf32x
copysignf32
copysignf64x
copysignf64
cosd128x
cosd128
cosd32
cosd64x
cosd64
cosf128x
cosf128
cosf16
cosf32x
cosf32
cosf64x
cosf64
coshd128x
coshd128
coshd32
coshd64x
coshd64
coshf128x
coshf128
coshf16
coshf32x
coshf32
coshf64x
coshf64
cospid128x
cospid128
cospid32
cospid64x
cospid64
cospif128x
cospif128
cospif16
cospif32x
cospif32
cospif64x
cospif64
cospif
cospil
cospi
cpowf128x
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tgammaf64x
tgammaf64
truncd128x
truncd128
truncd32
truncd64x
truncd64
truncf128x
truncf128
truncf16
truncf32x
truncf32
truncf64x
truncf64
ufromfpd128x
ufromfpd128
ufromfpd32
ufromfpd64x
ufromfpd64
ufromfpf128x
ufromfpf128
ufromfpf16
ufromfpf32x
ufromfpf32
ufromfpf64x
ufromfpf64
ufromfpf
ufromfpl
ufromfpxd128x
ufromfpxd128
ufromfpxd32
ufromfpxd64x
ufromfpxd64

ufromfpxf128x	ufromfpxf32x	ufromfpxf64	**ufromfpx**
ufromfpxf128	ufromfpxf32	**ufromfpxf**	**ufromfp**
ufromfpxf16	ufromfpxf64x	**ufromfpxl**	

5. RESULTING LISTS OF NEW SYSTEMATICALLY RESERVED IDENTIFIERS.

D128_HUGE_VAL
D128X_HUGE_VAL
D32_HUGE_VAL
D64_HUGE_VAL
D64X_HUGE_VAL
DBL_SNAN
dec128_acos
dec128_acosh
dec128_acospi
dec128_asin
dec128_asinh
dec128_asinpi
dec128_atan
dec128_atan2
dec128_atan2pi
dec128_atanh
dec128_atanpi
dec128_canonicalize
dec128_cbrt
dec128_ceil
dec128_compoundn
dec128_copysign
dec128_cos
dec128_cosh
dec128_cospi
dec128_decodebin
dec128_decodedec
dec128_encodebin
dec128_encodedec
dec128_erf
dec128_erfc
dec128_exp
dec128_exp10
dec128_exp10m1
dec128_exp2
dec128_exp2m1
dec128_expm1
dec128_fabs
dec128_fdim
dec128_floor
dec128_fma
dec128_fmax
dec128_fmaxmag
dec128_fmin
dec128_fminmag
dec128_fmod
dec128_frexp
dec128_getpayload
dec128_hypot
dec128_ilogb
dec128_ldexp
dec128_lgamma
dec128_llrint
dec128_llround
dec128_log
dec128_log10
dec128_log10p1
dec128_log1p
dec128_log2
dec128_log2p1
dec128_logb
dec128_logp1
dec128_lrint
dec128_lround
dec128_modf
dec128_nan
dec128_nearbyint
dec128_nextafter
dec128_nextdown
dec128_nexttoward
dec128_nextup
dec128_pow
dec128_pown
dec128_powr
dec128_quantize
dec128_quantum
dec128_remainder
dec128_rint
dec128_rootn
dec128_round
dec128_roundeven
dec128_rsqrt
dec128_samequantum
dec128_scalbln
dec128_scalbn
dec128_setpayload
dec128_setpayloadsig
dec128_sin
dec128_sinh
dec128_sinpi
DEC128_SNAN
dec128_sqrt
dec128_t
dec128_tan
dec128_tanh
dec128_tanpi
dec128_tgamma
dec128_todec32_add
dec128_todec32_div
dec128_todec32_fma
dec128_todec32_mul
dec128_todec32_sqrt
dec128_todec32_sub
dec128_todec64_add
dec128_todec64_div
dec128_todec64_fma
dec128_todec64_mul
dec128_todec64_sqrt
dec128_todec64_sub
dec128_todec64x_add
dec128_todec64x_div
dec128_todec64x_fma
dec128_todec64x_mul
dec128_todec64x_sqrt
dec128_todec64x_sub
dec128_toint
dec128_toint_logb
dec128_toint_quantexp
dec128_tointx
dec128_touint
dec128_touintx
dec128_trunc
dec128x_acos
dec128x_acosh
dec128x_acospi
dec128x_asin
dec128x_asinh
dec128x_asinpi
dec128x_atan
dec128x_atan2
dec128x_atan2pi
dec128x_atanh
dec128x_atanpi
dec128x_canonicalize
dec128x_cbrt
dec128x_ceil
dec128x_compoundn
dec128x_copysign
dec128x_cos
dec128x_cosh
dec128x_cospi
dec128x_decodebin
dec128x_decodedec
dec128x_encodebin
dec128x_encodedec
dec128x_erf
dec128x_erfc
dec128x_exp
dec128x_exp10
dec128x_exp10m1
dec128x_exp2
dec128x_exp2m1
dec128x_expm1
dec128x_fabs
dec128x_fdim
dec128x_floor
dec128x_fma
dec128x_fmax
dec128x_fmaxmag
dec128x_fmin
dec128x_fminmag
dec128x_fmod
dec128x_frexp
dec128x_getpayload
dec128x_hypot
dec128x_ilogb
dec128x_ldexp
dec128x_lgamma
dec128x_llrint
dec128x_llround
dec128x_log
dec128x_log10
dec128x_log10p1
dec128x_log1p
dec128x_log2
dec128x_log2p1
dec128x_logb
dec128x_logp1
dec128x_lrint
dec128x_lround
dec128x_modf
dec128x_nan
dec128x_nearbyint
dec128x_nextafter
dec128x_nextdown
dec128x_nexttoward
dec128x_nextup
dec128x_pow
dec128x_pown
dec128x_powr
dec128x_quantize
dec128x_quantum
dec128x_remainder
dec128x_rint
dec128x_rootn
dec128x_round

dec128x_roundeven
dec128x_rsqrt
dec128x_samequantum
dec128x_scalbln
dec128x_scalbn
dec128x_setpayload
dec128x_setpayloadsig
dec128x_sin
dec128x_sinh
dec128x_sinpi
DEC128X_SNAN
dec128x_sqrt
dec128x_t
dec128x_tan
dec128x_tanh
dec128x_tanpi
dec128x_tgamma
dec128x_todec128_add
dec128x_todec128_div
dec128x_todec128_fma
dec128x_todec128_mul
dec128x_todec128_sqrt
dec128x_todec128_sub
dec128x_todec32_add
dec128x_todec32_div
dec128x_todec32_fma
dec128x_todec32_mul
dec128x_todec32_sqrt
dec128x_todec32_sub
dec128x_todec64_add
dec128x_todec64_div
dec128x_todec64_fma
dec128x_todec64_mul
dec128x_todec64_sqrt
dec128x_todec64_sub
dec128x_todec64x_add
dec128x_todec64x_div
dec128x_todec64x_fma
dec128x_todec64x_mul
dec128x_todec64x_sqrt
dec128x_todec64x_sub
dec128x_toint
dec128x_toint_logb
dec128x_toint_quantexp
dec128x_tointx
dec128x_touint
dec128x_touintx
dec128x_trunc
dec32_acos
dec32_acosh
dec32_acospi
dec32_asin
dec32_asinh
dec32_asinpi
dec32_atan
dec32_atan2
dec32_atan2pi
dec32_atanh
dec32_atanpi
dec32_canonicalize
dec32_cbrt
dec32_ceil
dec32_compoundn
dec32_copysign
dec32_cos
dec32_cosh
dec32_cospi
dec32_decodebin
dec32_decodedec
dec32_encodebin
dec32_encodedec
dec32_erf
dec32_erfc
dec32_exp
dec32_exp10
dec32_exp10m1
dec32_exp2
dec32_exp2m1
dec32_expm1
dec32_fabs
dec32_fdim
dec32_floor
dec32_fma
dec32_fmax
dec32_fmaxmag
dec32_fmin
dec32_fminmag
dec32_fmod
dec32_frexp
dec32_getpayload
dec32_hypot
dec32_ilogb
dec32_ldexp
dec32_lgamma
dec32_llrint
dec32_llround
dec32_log
dec32_log10
dec32_log10p1
dec32_log1p
dec32_log2
dec32_log2p1
dec32_logb
dec32_logp1
dec32_lrint
dec32_lround
dec32_modf
dec32_nan
dec32_nearbyint
dec32_nextafter
dec32_nextdown
dec32_nexttoward
dec32_nextup
dec32_pow
dec32_pown
dec32_powr
dec32_quantize
dec32_quantum
dec32_remainder
dec32_rint
dec32_rootn
dec32_round
dec32_roundeven
dec32_rsqrt
dec32_samequantum
dec32_scalbln
dec32_scalbn
dec32_setpayload
dec32_setpayloadsig
dec32_sin
dec32_sinh
dec32_sinpi
DEC32_SNAN
dec32_sqrt
dec32_t
dec32_tan
dec32_tanh
dec32_tanpi
dec32_tgamma
dec32_toint
dec32_toint_logb
dec32_toint_quantexp
dec32_tointx
dec32_touint
dec32_touintx
dec32_trunc
dec32x_t
dec64_acos
dec64_acosh
dec64_acospi
dec64_asin
dec64_asinh
dec64_asinpi
dec64_atan
dec64_atan2
dec64_atan2pi
dec64_atanh
dec64_atanpi
dec64_canonicalize
dec64_cbrt
dec64_ceil
dec64_compoundn
dec64_copysign
dec64_cos
dec64_cosh
dec64_cospi
dec64_decodebin
dec64_decodedec
dec64_encodebin
dec64_encodedec
dec64_erf
dec64_erfc
dec64_exp
dec64_exp10
dec64_exp10m1
dec64_exp2
dec64_exp2m1
dec64_expm1
dec64_fabs
dec64_fdim
dec64_fma
dec64_fmax
dec64_fmaxmag
dec64_fmin
dec64_fminmag
dec64_fmod
dec64_frexp
dec64_getpayload
dec64_hypot
dec64_ilogb
dec64_ldexp
dec64_lgamma
dec64_llrint
dec64_llround
dec64_log
dec64_log10
dec64_log10p1
dec64_log1p
dec64_log2
dec64_log2p1
dec64_logb
dec64_logp1
dec64_lrint
dec64_lround
dec64_modf
dec64_nan
dec64_nearbyint
dec64_nextafter

dec64_nextdown
dec64_nexttoward
dec64_nextup
dec64_pow
dec64_pown
dec64_powr
dec64_quantize
dec64_quantum
dec64_remainder
dec64_rint
dec64_rootn
dec64_round
dec64_roundeven
dec64_rsqrt
dec64_samequantum
dec64_scalbln
dec64_scalbn
dec64_setpayload
dec64_setpayloadsig
dec64_sin
dec64_sinh
dec64_sinpi
DEC64_SNAN
dec64_sqrt
dec64_t
dec64_tan
dec64_tanh
dec64_tanpi
dec64_tgamma
dec64_todec32_add
dec64_todec32_div
dec64_todec32_fma
dec64_todec32_mul
dec64_todec32_sqrt
dec64_todec32_sub
dec64_toint
dec64_toint_logb
dec64_toint_quantexp
dec64_tointx
dec64_touint
dec64_touintx
dec64_trunc
dec64x_acos
dec64x_acosh
dec64x_acospi
dec64x_asin
dec64x_asinh
dec64x_asinpi
dec64x_atan
dec64x_atan2
dec64x_atan2pi
dec64x_atanh
dec64x_atanpi
dec64x_canonicalize
dec64x_cbrt
dec64x_ceil
dec64x_compoundn
dec64x_copysign
dec64x_cos
dec64x_cosh
dec64x_cospi
dec64x_decodebin
dec64x_decodedec
dec64x_encodebin
dec64x_encodedec
dec64x_erf
dec64x_erfc
dec64x_exp
dec64x_exp10
dec64x_exp10m1
dec64x_exp2
dec64x_exp2m1
dec64x_expm1
dec64x_fabs
dec64x_fdim
dec64x_fma
dec64x_fmax
dec64x_fmaxmag
dec64x_fmin
dec64x_fminmag
dec64x_fmod
dec64x_frexp
dec64x_getpayload
dec64x_hypot
dec64x_ilogb
dec64x_ldexp
dec64x_lgamma
dec64x_llrint
dec64x_llround
dec64x_log
dec64x_log10
dec64x_log10p1
dec64x_log1p
dec64x_log2
dec64x_log2p1
dec64x_logb
dec64x_logp1
dec64x_lrint
dec64x_lround
dec64x_modf
dec64x_nan
dec64x_nearbyint
dec64x_nextafter
dec64x_nextdown
dec64x_nexttoward
dec64x_nextup
dec64x_pow
dec64x_pown
dec64x_powr
dec64x_quantize
dec64x_quantum
dec64x_remainder
dec64x_rint
dec64x_rootn
dec64x_round
dec64x_roundeven
dec64x_rsqrt
dec64x_samequantum
dec64x_scalbln
dec64x_scalbn
dec64x_setpayload
dec64x_setpayloadsig
dec64x_sin
dec64x_sinh
dec64x_sinpi
DEC64X_SNAN
dec64x_sqrt
dec64x_t
dec64x_tan
dec64x_tanh
dec64x_tanpi
dec64x_tgamma
dec64x_todec32_add
dec64x_todec32_div
dec64x_todec32_fma
dec64x_todec32_mul
dec64x_todec32_sqrt
dec64x_todec32_sub
dec64x_todec64_add
dec64x_todec64_div
dec64x_todec64_fma
dec64x_todec64_mul
dec64x_todec64_sqrt
dec64x_todec64_sub
dec64x_toint
dec64x_toint_logb
dec64x_toint_quantexp
dec64x_tointx
dec64x_touint
dec64x_touintx
dec64x_trunc
decimal128_t
decimal32_t
decimal64_t
F128_HUGE_VAL
F128X_HUGE_VAL
F32_HUGE_VAL
F32X_HUGE_VAL
F64_HUGE_VAL
F64X_HUGE_VAL
FE_DEC_ROUND
fe_getmode
FE_ROUND
fe_setexcept
fe_setmode
fe_testexceptflag
float128_t
float32_t
float64_t
flt128_acos
flt128_acosh
flt128_acospi
flt128_asin
flt128_asinh
flt128_asinpi
flt128_atan
flt128_atan2
flt128_atan2pi
flt128_atanh
flt128_atanpi
flt128_canonicalize
flt128_cbrt
flt128_ceil
flt128_compoundn
flt128_copysign
flt128_cos
flt128_cosh
flt128_cospi
flt128_decodebin
flt128_decodedec
flt128_encodebin
flt128_encodedec
flt128_erf
flt128_erfc
flt128_exp
flt128_exp10
flt128_exp10m1
flt128_exp2
flt128_exp2m1
flt128_expm1
flt128_fabs
flt128_fdim
flt128_fma
flt128_fmax
flt128_fmaxmag
flt128_fmin
flt128_fminmag
flt128_fmod

flt128_frexp
flt128_getpayload
flt128_hypot
flt128_ilogb
flt128_ldexp
flt128_lgamma
flt128_llrint
flt128_llround
flt128_log
flt128_log10
flt128_log10p1
flt128_log1p
flt128_log2
flt128_log2p1
flt128_logb
flt128_logp1
flt128_lrint
flt128_lround
flt128_modf
flt128_nan
flt128_nearbyint
flt128_nextafter
flt128_nextdown
flt128_nexttoward
flt128_nextup
flt128_pow
flt128_pown
flt128_powr
flt128_quantize
flt128_quantum
flt128_remainder
flt128_rint
flt128_rootn
flt128_round
flt128_roundeven
flt128_rsqrt
flt128_samequantum
flt128_scalbln
flt128_scalbn
flt128_setpayload
flt128_setpayloadsig
flt128_sin
flt128_sinh
flt128_sinpi
FLT128_SNAN
flt128_sqrt
flt128_t
flt128_tan
flt128_tanh
flt128_tanpi
flt128_tgamma
flt128_toflt32_add
flt128_toflt32_div
flt128_toflt32_fma
flt128_toflt32_mul
flt128_toflt32_sqrt
flt128_toflt32_sub
flt128_toflt32x_add
flt128_toflt32x_div
flt128_toflt32x_fma
flt128_toflt32x_mul
flt128_toflt32x_sqrt
flt128_toflt32x_sub
flt128_toint
flt128_toint_logb
flt128_toint_quantexp
flt128_tointx
flt128_touint
flt128_touintx
flt128_trunc
flt128x_acos
flt128x_acosh
flt128x_acospi
flt128x_asin
flt128x_asinh
flt128x_asinpi
flt128x_atan
flt128x_atan2
flt128x_atan2pi
flt128x_atanh
flt128x_atanpi
flt128x_canonicalize
flt128x_cbrt
flt128x_ceil
flt128x_compoundn
flt128x_copysign
flt128x_cos
flt128x_cosh
flt128x_cospi
flt128x_decodebin
flt128x_decodedec
flt128x_encodebin
flt128x_encodedec
flt128x_erf
flt128x_erfc
flt128x_exp
flt128x_exp10
flt128x_exp10m1
flt128x_exp2
flt128x_exp2m1
flt128x_expm1
flt128x_fabs
flt128x_fdim
flt128x_floor
flt128x_fma
flt128x_fmax
flt128x_fmaxmag
flt128x_fmin
flt128x_fminmag
flt128x_fmod
flt128x_frexp
flt128x_getpayload
flt128x_hypot
flt128x_ilogb
flt128x_ldexp
flt128x_lgamma
flt128x_llrint
flt128x_llround
flt128x_log
flt128x_log10
flt128x_log10p1
flt128x_log1p
flt128x_log2
flt128x_log2p1
flt128x_logb
flt128x_logp1
flt128x_lrint
flt128x_lround
flt128x_modf
flt128x_nan
flt128x_nearbyint
flt128x_nextafter
flt128x_nextdown
flt128x_nexttoward
flt128x_nextup
flt128x_pow
flt128x_pown
flt128x_powr
flt128x_quantize
flt128x_quantum
flt128x_remainder
flt128x_rint
flt128x_rootn
flt128x_round
flt128x_roundeven
flt128x_rsqrt
flt128x_samequantum
flt128x_scalbln
flt128x_scalbn
flt128x_setpayload
flt128x_setpayloadsig
flt128x_sin
flt128x_sinh
flt128x_sinpi
FLT128X_SNAN
flt128x_sqrt
flt128x_t
flt128x_tan
flt128x_tanh
flt128x_tanpi
flt128x_tgamma
flt128x_toflt128_add
flt128x_toflt128_div
flt128x_toflt128_fma
flt128x_toflt128_mul
flt128x_toflt128_sqrt
flt128x_toflt128_sub
flt128x_toflt32_add
flt128x_toflt32_div
flt128x_toflt32_fma
flt128x_toflt32_mul
flt128x_toflt32_sqrt
flt128x_toflt32_sub
flt128x_toflt32x_add
flt128x_toflt32x_div
flt128x_toflt32x_fma
flt128x_toflt32x_mul
flt128x_toflt32x_sqrt
flt128x_toflt32x_sub
flt128x_toflt64_add
flt128x_toflt64_div
flt128x_toflt64_fma
flt128x_toflt64_mul
flt128x_toflt64_sqrt
flt128x_toflt64_sub
flt128x_toflt64x_add
flt128x_toflt64x_div
flt128x_toflt64x_fma
flt128x_toflt64x_mul
flt128x_toflt64x_sqrt
flt128x_toflt64x_sub
flt128x_toint
flt128x_toint_logb
flt128x_toint_quantexp
flt128x_tointx
flt128x_touint
flt128x_touintx
flt128x_trunc
flt32_acos
flt32_acosh
flt32_acospi
flt32_asin
flt32_asinh
flt32_asinpi
flt32_atan
flt32_atan2
flt32_atan2pi
flt32_atanh

flt32_atanpi
flt32_canonicalize
flt32_cbrt
flt32_ceil
flt32_compoundn
flt32_copysign
flt32_cos
flt32_cosh
flt32_cospi
flt32_decodebin
flt32_decodedec
flt32_encodebin
flt32_encodedec
flt32_erf
flt32_erfc
flt32_exp
flt32_exp10
flt32_exp10m1
flt32_exp2
flt32_exp2m1
flt32_expm1
flt32_fabs
flt32_fdim
flt32_floor
flt32_fma
flt32_fmax
flt32_fmaxmag
flt32_fmin
flt32_fminmag
flt32_fmod
flt32_frexp
flt32_getpayload
flt32_hypot
flt32_ilogb
flt32_ldexp
flt32_lgamma
flt32_llrint
flt32_llround
flt32_log
flt32_log10
flt32_log10p1
flt32_log1p
flt32_log2
flt32_log2p1
flt32_logb
flt32_logp1
flt32_lrint
flt32_lround
flt32_modf
flt32_nan
flt32_nearbyint
flt32_nextafter
flt32_nextdown
flt32_nexttoward
flt32_nextup
flt32_pow
flt32_pown
flt32_powr
flt32_quantize
flt32_quantum
flt32_remainder
flt32_rint
flt32_rootn
flt32_round
flt32_roundeven
flt32_rsqrt
flt32_samequantum
flt32_scalbln
flt32_scalbn
flt32_setpayload
flt32_setpayloadsig
flt32_sin
flt32_sinh
flt32_sinpi
FLT32_SNAN
flt32_sqrt
flt32_t
flt32_tan
flt32_tanh
flt32_tanpi
flt32_tgamma
flt32_toint
flt32_toint_logb
flt32_toint_quantexp
flt32_tointx
flt32_touint
flt32_touintx
flt32_trunc
flt32x_acos
flt32x_acosh
flt32x_acospi
flt32x_asin
flt32x_asinh
flt32x_asinpi
flt32x_atan
flt32x_atan2
flt32x_atan2pi
flt32x_atanh
flt32x_atanpi
flt32x_canonicalize
flt32x_cbrt
flt32x_ceil
flt32x_compoundn
flt32x_copysign
flt32x_cos
flt32x_cosh
flt32x_cospi
flt32x_decodebin
flt32x_decodedec
flt32x_encodebin
flt32x_encodedec
flt32x_erf
flt32x_erfc
flt32x_exp
flt32x_exp10
flt32x_exp10m1
flt32x_exp2
flt32x_exp2m1
flt32x_expm1
flt32x_fabs
flt32x_fdim
flt32x_floor
flt32x_fma
flt32x_fmax
flt32x_fmaxmag
flt32x_fmin
flt32x_fminmag
flt32x_fmod
flt32x_frexp
flt32x_getpayload
flt32x_hypot
flt32x_ilogb
flt32x_ldexp
flt32x_lgamma
flt32x_llrint
flt32x_llround
flt32x_log
flt32x_log10
flt32x_log10p1
flt32x_log1p
flt32x_log2
flt32x_log2p1
flt32x_logb
flt32x_logp1
flt32x_lrint
flt32x_lround
flt32x_modf
flt32x_nan
flt32x_nearbyint
flt32x_nextafter
flt32x_nextdown
flt32x_nexttoward
flt32x_nextup
flt32x_pow
flt32x_pown
flt32x_powr
flt32x_quantize
flt32x_quantum
flt32x_remainder
flt32x_rint
flt32x_rootn
flt32x_round
flt32x_roundeven
flt32x_rsqrt
flt32x_samequantum
flt32x_scalbln
flt32x_scalbn
flt32x_setpayload
flt32x_setpayloadsig
flt32x_sin
flt32x_sinh
flt32x_sinpi
FLT32X_SNAN
flt32x_sqrt
flt32x_t
flt32x_tan
flt32x_tanh
flt32x_tanpi
flt32x_tgamma
flt32x_toflt32_add
flt32x_toflt32_div
flt32x_toflt32_fma
flt32x_toflt32_mul
flt32x_toflt32_sqrt
flt32x_toflt32_sub
flt32x_toint
flt32x_toint_logb
flt32x_toint_quantexp
flt32x_tointx
flt32x_touint
flt32x_touintx
flt32x_trunc
flt64_acos
flt64_acosh
flt64_acospi
flt64_asin
flt64_asinh
flt64_asinpi
flt64_atan
flt64_atan2
flt64_atan2pi
flt64_atanh
flt64_atanpi
flt64_canonicalize
flt64_cbrt
flt64_ceil
flt64_compoundn
flt64_copysign

flt64_cos
flt64_cosh
flt64_cospi
flt64_decodebin
flt64_decodedec
flt64_encodebin
flt64_encodedec
flt64_erf
flt64_erfc
flt64_exp
flt64_exp10
flt64_exp10m1
flt64_exp2
flt64_exp2m1
flt64_expm1
flt64_fabs
flt64_fdim
flt64_fma
flt64_fmax
flt64_fmaxmag
flt64_fmin
flt64_fminmag
flt64_fmod
flt64_frexp
flt64_getpayload
flt64_hypot
flt64_ilogb
flt64_ldexp
flt64_lgamma
flt64_llrint
flt64_llround
flt64_log
flt64_log10
flt64_log10p1
flt64_log1p
flt64_log2
flt64_log2p1
flt64_logb
flt64_logp1
flt64_lrint
flt64_lround
flt64_modf
flt64_nan
flt64_nearbyint
flt64_nextafter
flt64_nextdown
flt64_nexttoward
flt64_nextup
flt64_pow
flt64_pown
flt64_powr
flt64_quantize
flt64_quantum
flt64_remainder
flt64_rint
flt64_rootn
flt64_round
flt64_roundeven
flt64_rsqrt
flt64_samequantum
flt64_scalbln
flt64_scalbn
flt64_setpayload
flt64_setpayloadsig
flt64_sin
flt64_sinh
flt64_sinpi
FLT64_SNAN
flt64_sqrt
flt64_t
flt64_tan
flt64_tanh
flt64_tanpi
flt64_tgamma
flt64_toflt32_add
flt64_toflt32_div
flt64_toflt32_fma
flt64_toflt32_mul
flt64_toflt32_sqrt
flt64_toflt32_sub
flt64_toflt32x_add
flt64_toflt32x_div
flt64_toflt32x_fma
flt64_toflt32x_mul
flt64_toflt32x_sqrt
flt64_toflt32x_sub
flt64_toint
flt64_toint_logb
flt64_toint_quantexp
flt64_tointx
flt64_touint
flt64_touintx
flt64_trunc
flt64x_acos
flt64x_acosh
flt64x_acospi
flt64x_asin
flt64x_asinh
flt64x_asinpi
flt64x_atan
flt64x_atan2
flt64x_atan2pi
flt64x_atanh
flt64x_atanpi
flt64x_canonicalize
flt64x_cbrt
flt64x_ceil
flt64x_compoundn
flt64x_copysign
flt64x_cos
flt64x_cosh
flt64x_cospi
flt64x_decodebin
flt64x_decodedec
flt64x_encodebin
flt64x_encodedec
flt64x_erf
flt64x_erfc
flt64x_exp
flt64x_exp10
flt64x_exp10m1
flt64x_exp2
flt64x_exp2m1
flt64x_expm1
flt64x_fabs
flt64x_fdim
flt64x_fma
flt64x_fmax
flt64x_fmaxmag
flt64x_fmin
flt64x_fminmag
flt64x_fmod
flt64x_frexp
flt64x_getpayload
flt64x_hypot
flt64x_ilogb
flt64x_ldexp
flt64x_lgamma
flt64x_llrint
flt64x_llround
flt64x_log
flt64x_log10
flt64x_log10p1
flt64x_log1p
flt64x_log2
flt64x_log2p1
flt64x_logb
flt64x_logp1
flt64x_lrint
flt64x_lround
flt64x_modf
flt64x_nan
flt64x_nearbyint
flt64x_nextafter
flt64x_nextdown
flt64x_nexttoward
flt64x_nextup
flt64x_pow
flt64x_pown
flt64x_powr
flt64x_quantize
flt64x_quantum
flt64x_remainder
flt64x_rint
flt64x_rootn
flt64x_round
flt64x_roundeven
flt64x_rsqrt
flt64x_samequantum
flt64x_scalbln
flt64x_scalbn
flt64x_setpayload
flt64x_setpayloadsig
flt64x_sin
flt64x_sinh
flt64x_sinpi
FLT64X_SNAN
flt64x_sqrt
flt64x_t
flt64x_tan
flt64x_tanh
flt64x_tanpi
flt64x_tgamma
flt64x_toflt32_add
flt64x_toflt32_div
flt64x_toflt32_fma
flt64x_toflt32_mul
flt64x_toflt32_sqrt
flt64x_toflt32_sub
flt64x_toflt32x_add
flt64x_toflt32x_div
flt64x_toflt32x_fma
flt64x_toflt32x_mul
flt64x_toflt32x_sqrt
flt64x_toflt32x_sub
flt64x_toflt64_add
flt64x_toflt64_div
flt64x_toflt64_fma
flt64x_toflt64_mul
flt64x_toflt64_sqrt
flt64x_toflt64_sub
flt64x_toint
flt64x_toint_logb
flt64x_toint_quantexp
flt64x_tointx
flt64x_touint
flt64x_touintx
flt64x_trunc

flt_acospi
flt_asinpi
flt_atan2pi
flt_atanpi
flt_canonicalize
flt_compoundn
flt_cospi
flt_exp10
flt_exp10m1
flt_exp2m1
flt_fmaxmag
flt_fminmag
flt_getpayload
flt_log10p1
flt_log2p1
flt_logp1
flt_nextdown
flt_nextup
flt_pown
flt_powr
flt_rootn
flt_roundeven
flt_rsqrt
flt_setpayload
flt_setpayloadsig
flt_sinpi
FLT_SNAN
flt_tanpi
flt_toint
flt_toint_logb
flt_tointx
flt_touint
flt_touintx
FP_DECIMAL_DIG
ldbl_acospi
ldbl_asinpi
ldbl_atan2pi
ldbl_atanpi
ldbl_canonicalize
ldbl_compoundn
ldbl_cospi
ldbl_exp10
ldbl_exp10m1
ldbl_exp2m1
ldbl_fmaxmag
ldbl_fminmag
ldbl_getpayload
ldbl_log10p1
ldbl_log2p1
ldbl_logp1
ldbl_nextdown
ldbl_nextup
ldbl_pown
ldbl_powr
ldbl_rootn
ldbl_roundeven
ldbl_rsqrt
ldbl_setpayload
ldbl_setpayloadsig
ldbl_sinpi
LDBL_SNAN
ldbl_tanpi
ldbl_todbl_add
ldbl_todbl_div
ldbl_todbl_fma
ldbl_todbl_mul
ldbl_todbl_sqrt
ldbl_todbl_sub
ldbl_toflt_add
ldbl_toflt_div
ldbl_toflt_fma
ldbl_toflt_mul
ldbl_toflt_sqrt
ldbl_toflt_sub
ldbl_toint
ldbl_toint_logb
ldbl_tointx
ldbl_touint
ldbl_touintx
todbl_add
todbl_div
todbl_fma
todbl_mul
todbl_sqrt
todbl_sub
todec128_add
todec128_div
todec128_fma
todec128_mul
todec128_sqrt
todec128_sub
todec32_add
todec32_div
todec32_fma
todec32_mul
todec32_sqrt
todec32_sub
todec64_add
todec64_div
todec64_fma
todec64_mul
todec64_sqrt
todec64_sub
todec64x_add
todec64x_div
todec64x_fma
todec64x_mul
todec64x_sqrt
todec64x_sub
toflt128_add
toflt128_div
toflt128_fma
toflt128_mul
toflt128_sqrt
toflt128_sub
toflt32_add
toflt32_div
toflt32_fma
toflt32_mul
toflt32_sqrt
toflt32_sub
toflt32x_add
toflt32x_div
toflt32x_fma
toflt32x_mul
toflt32x_sqrt
toflt32x_sub
toflt64_add
toflt64_div
toflt64_fma
toflt64_mul
toflt64_sqrt
toflt64_sub
toflt64x_add
toflt64x_div
toflt64x_fma
toflt64x_mul
toflt64x_sqrt
toflt64x_sub
toflt_add
toflt_div
toflt_fma
toflt_mul
toflt_sqrt
toflt_sub
toint
toint_logb
toint_quantexp
tointx
touint
touintx

6. SCRIPTS FOR THE TRANSISTION

Some implementations have already implemented the FP TS with the names that are given there, or are currently integrating them into their C library. Once the renaming as proposed here has been decided, we will provide a tool to perform it automatically in the form of a script for the POSIX tool `sed`, see below for the current version.
Another possibility is to provide a temporary fix in form of macro `#define`.

6.1. An sed replacement script

```
# no change for CHAR_WIDTH
s/\<CR_DECIMAL_DIG\>/FP_DECIMAL_DIG/g
# no change for DEC128X_EPSILON
# no change for DEC128X_MANT_DIG
# no change for DEC128X_MAX_EXP
# no change for DEC128X_MAX
# no change for DEC128X_MIN_EXP
# no change for DEC128X_MIN
# no change for DEC128X_TRUE_MIN
# no change for DEC64X_EPSILON
# no change for DEC64X_MANT_DIG
# no change for DEC64X_MAX_EXP
# no change for DEC64X_MAX
# no change for DEC64X_MIN_EXP
# no change for DEC64X_MIN
# no change for DEC64X_TRUE_MIN
s/\<FENV_DEC_ROUND\>/FE_DEC_ROUND/g
s/\<FENV_ROUND\>/FE_ROUND/g
# no change for FLT128X_DECIMAL_DIG
# no change for FLT128X_DIG
# no change for FLT128X_EPSILON
# no change for FLT128X_MANT_DIG
# no change for FLT128X_MAX_10_EXP
# no change for FLT128X_MAX_EXP
# no change for FLT128X_MAX
# no change for FLT128X_MIN_10_EXP
# no change for FLT128X_MIN_EXP
# no change for FLT128X_MIN
# no change for FLT128X_TRUE_MIN
# no change for FLT128_DECIMAL_DIG
# no change for FLT128_DIG
# no change for FLT128_EPSILON
# no change for FLT128_MANT_DIG
# no change for FLT128_MAX_10_EXP
# no change for FLT128_MAX_EXP
# no change for FLT128_MAX
# no change for FLT128_MIN_10_EXP
# no change for FLT128_MIN_EXP
# no change for FLT128_MIN
# no change for FLT128_TRUE_MIN
# no change for FLT16_DECIMAL_DIG
# no change for FLT16_DIG
# no change for FLT16_EPSILON
# no change for FLT16_MANT_DIG
# no change for FLT16_MAX_10_EXP
# no change for FLT16_MAX_EXP
# no change for FLT16_MAX
# no change for FLT16_MIN_10_EXP
# no change for FLT16_MIN_EXP
# no change for FLT16_MIN
# no change for FLT16_TRUE_MIN
# no change for FLT32X_DECIMAL_DIG
```

```
# no change for FLT32X_DIG
# no change for FLT32X_EPSILON
# no change for FLT32X_MANT_DIG
# no change for FLT32X_MAX_10_EXP
# no change for FLT32X_MAX_EXP
# no change for FLT32X_MAX
# no change for FLT32X_MIN_10_EXP
# no change for FLT32X_MIN_EXP
# no change for FLT32X_MIN
# no change for FLT32X_TRUE_MIN
# no change for FLT32_DECIMAL_DIG
# no change for FLT32_DIG
# no change for FLT32_EPSILON
# no change for FLT32_MANT_DIG
# no change for FLT32_MAX_10_EXP
# no change for FLT32_MAX_EXP
# no change for FLT32_MAX
# no change for FLT32_MIN_10_EXP
# no change for FLT32_MIN_EXP
# no change for FLT32_MIN
# no change for FLT32_TRUE_MIN
# no change for FLT64X_DECIMAL_DIG
# no change for FLT64X_DIG
# no change for FLT64X_EPSILON
# no change for FLT64X_MANT_DIG
# no change for FLT64X_MAX_10_EXP
# no change for FLT64X_MAX_EXP
# no change for FLT64X_MAX
# no change for FLT64X_MIN_10_EXP
# no change for FLT64X_MIN_EXP
# no change for FLT64X_MIN
# no change for FLT64X_TRUE_MIN
# no change for FLT64_DECIMAL_DIG
# no change for FLT64_DIG
# no change for FLT64_EPSILON
# no change for FLT64_MANT_DIG
# no change for FLT64_MAX_10_EXP
# no change for FLT64_MAX_EXP
# no change for FLT64_MAX
# no change for FLT64_MIN_10_EXP
# no change for FLT64_MIN_EXP
# no change for FLT64_MIN
# no change for FLT64_TRUE_MIN
s/\<HUGE_VAL_D128X\>/D128X_HUGE_VAL/g
s/\<HUGE_VAL_D128\>/D128_HUGE_VAL/g
s/\<HUGE_VAL_D32\>/D32_HUGE_VAL/g
s/\<HUGE_VAL_D64X\>/D64X_HUGE_VAL/g
s/\<HUGE_VAL_D64\>/D64_HUGE_VAL/g
s/\<HUGE_VAL_F128X\>/F128X_HUGE_VAL/g
s/\<HUGE_VAL_F128\>/F128_HUGE_VAL/g
s/\<HUGE_VAL_F16\>/F16_HUGE_VAL/g
s/\<HUGE_VAL_F32X\>/F32X_HUGE_VAL/g
s/\<HUGE_VAL_F32\>/F32_HUGE_VAL/g
s/\<HUGE_VAL_F64X\>/F64X_HUGE_VAL/g
s/\<HUGE_VAL_F64\>/F64_HUGE_VAL/g
# no change for LLONG_WIDTH
# no change for LONG_WIDTH
# no change for PTRDIFF_WIDTH
# no change for SCHAR_WIDTH
# no change for SHRT_WIDTH
# no change for SIZE_WIDTH
s/\<SNAND128X\>/DEC128X_SNAN/g
s/\<SNAND128\>/DEC128_SNAN/g
```

```
116 s/\<SNAND32\>/DEC32_SNAN/g
117 s/\<SNAND64X\>/DEC64X_SNAN/g
118 s/\<SNAND64\>/DEC64_SNAN/g
119 s/\<SNANF128X\>/FLT128X_SNAN/g
120 s/\<SNANF128\>/FLT128_SNAN/g
121 s/\<SNANF16\>/FLT16_SNAN/g
122 s/\<SNANF32X\>/FLT32X_SNAN/g
123 s/\<SNANF32\>/FLT32_SNAN/g
124 s/\<SNANF64X\>/FLT64X_SNAN/g
125 s/\<SNANF64\>/FLT64_SNAN/g
126 s/\<SNANF\>/FLT_SNAN/g
127 s/\<SNANL\>/LDBL_SNAN/g
128 s/\<SNAN\>/DBL_SNAN/g
129 # no change for UCHAR_WIDTH
130 # no change for ULLONG_WIDTH
131 # no change for ULONG_WIDTH
132 # no change for USHRT_WIDTH
133 # no change for WCHAR_WIDTH
134 # no change for WINT_WIDTH
135 s/\<acosd128x\>/dec128x_acos/g
136 s/\<acosd128\>/dec128_acos/g
137 s/\<acosd32\>/dec32_acos/g
138 s/\<acosd64x\>/dec64x_acos/g
139 s/\<acosd64\>/dec64_acos/g
140 s/\<acosf128x\>/flt128x_acos/g
141 s/\<acosf128\>/flt128_acos/g
142 s/\<acosf16\>/flt16_acos/g
143 s/\<acosf32x\>/flt32x_acos/g
144 s/\<acosf32\>/flt32_acos/g
145 s/\<acosf64x\>/flt64x_acos/g
146 s/\<acosf64\>/flt64_acos/g
147 s/\<acoshd128x\>/dec128x_acosh/g
148 s/\<acoshd128\>/dec128_acosh/g
149 s/\<acoshd32\>/dec32_acosh/g
150 s/\<acoshd64x\>/dec64x_acosh/g
151 s/\<acoshd64\>/dec64_acosh/g
152 s/\<acoshf128x\>/flt128x_acosh/g
153 s/\<acoshf128\>/flt128_acosh/g
154 s/\<acoshf16\>/flt16_acosh/g
155 s/\<acoshf32x\>/flt32x_acosh/g
156 s/\<acoshf32\>/flt32_acosh/g
157 s/\<acoshf64x\>/flt64x_acosh/g
158 s/\<acoshf64\>/flt64_acosh/g
159 s/\<acospid128x\>/dec128x_acospi/g
160 s/\<acospid128\>/dec128_acospi/g
161 s/\<acospid32\>/dec32_acospi/g
162 s/\<acospid64x\>/dec64x_acospi/g
163 s/\<acospid64\>/dec64_acospi/g
164 s/\<acospif128x\>/flt128x_acospi/g
165 s/\<acospif128\>/flt128_acospi/g
166 s/\<acospif16\>/flt16_acospi/g
167 s/\<acospif32x\>/flt32x_acospi/g
168 s/\<acospif32\>/flt32_acospi/g
169 s/\<acospif64x\>/flt64x_acospi/g
170 s/\<acospif64\>/flt64_acospi/g
171 s/\<acospif\>/flt_acospi/g
172 s/\<acospil\>/ldbl_acospi/g
173 # no change for acospi
174 s/\<asind128x\>/dec128x_asin/g
175 s/\<asind128\>/dec128_asin/g
176 s/\<asind32\>/dec32_asin/g
177 s/\<asind64x\>/dec64x_asin/g
178 s/\<asind64\>/dec64_asin/g
```

```
s/\<asinf128x\>/flt128x_asin/g
s/\<asinf128\>/flt128_asin/g
s/\<asinf16\>/flt16_asin/g
s/\<asinf32x\>/flt32x_asin/g
s/\<asinf32\>/flt32_asin/g
s/\<asinf64x\>/flt64x_asin/g
s/\<asinf64\>/flt64_asin/g
s/\<asinhd128x\>/dec128x_asinh/g
s/\<asinhd128\>/dec128_asinh/g
s/\<asinhd32\>/dec32_asinh/g
s/\<asinhd64x\>/dec64x_asinh/g
s/\<asinhd64\>/dec64_asinh/g
s/\<asinhf128x\>/flt128x_asinh/g
s/\<asinhf128\>/flt128_asinh/g
s/\<asinhf16\>/flt16_asinh/g
s/\<asinhf32x\>/flt32x_asinh/g
s/\<asinhf32\>/flt32_asinh/g
s/\<asinhf64x\>/flt64x_asinh/g
s/\<asinhf64\>/flt64_asinh/g
s/\<asinpid128x\>/dec128x_asinpi/g
s/\<asinpid128\>/dec128_asinpi/g
s/\<asinpid32\>/dec32_asinpi/g
s/\<asinpid64x\>/dec64x_asinpi/g
s/\<asinpid64\>/dec64_asinpi/g
s/\<asinpif128x\>/flt128x_asinpi/g
s/\<asinpif128\>/flt128_asinpi/g
s/\<asinpif16\>/flt16_asinpi/g
s/\<asinpif32x\>/flt32x_asinpi/g
s/\<asinpif32\>/flt32_asinpi/g
s/\<asinpif64x\>/flt64x_asinpi/g
s/\<asinpif64\>/flt64_asinpi/g
s/\<asinpif\>/flt_asinpi/g
s/\<asinpil\>/ldbl_asinpi/g
# no change for asinpi
s/\<atan2d128x\>/dec128x_atan2/g
s/\<atan2d128\>/dec128_atan2/g
s/\<atan2d32\>/dec32_atan2/g
s/\<atan2d64x\>/dec64x_atan2/g
s/\<atan2d64\>/dec64_atan2/g
s/\<atan2f128x\>/flt128x_atan2/g
s/\<atan2f128\>/flt128_atan2/g
s/\<atan2f32x\>/flt32x_atan2/g
s/\<atan2f32\>/flt32_atan2/g
s/\<atan2f64x\>/flt64x_atan2/g
s/\<atan2f64\>/flt64_atan2/g
s/\<atan2pid128x\>/dec128x_atan2pi/g
s/\<atan2pid128\>/dec128_atan2pi/g
s/\<atan2pid32\>/dec32_atan2pi/g
s/\<atan2pid64x\>/dec64x_atan2pi/g
s/\<atan2pid64\>/dec64_atan2pi/g
s/\<atan2pif128x\>/flt128x_atan2pi/g
s/\<atan2pif128\>/flt128_atan2pi/g
s/\<atan2pif32x\>/flt32x_atan2pi/g
s/\<atan2pif32\>/flt32_atan2pi/g
s/\<atan2pif64x\>/flt64x_atan2pi/g
s/\<atan2pif64\>/flt64_atan2pi/g
s/\<atan2pif\>/flt_atan2pi/g
s/\<atan2pil\>/ldbl_atan2pi/g
# no change for atan2pi
s/\<atand128x\>/dec128x_atan/g
s/\<atand128\>/dec128_atan/g
s/\<atand32\>/dec32_atan/g
s/\<atand64x\>/dec64x_atan/g
```

```
242 s/\<atand64\>/dec64_atan/g
243 s/\<atanf128x\>/flt128x_atan/g
244 s/\<atanf128\>/flt128_atan/g
245 s/\<atanf16\>/flt16_atan/g
246 s/\<atanf32x\>/flt32x_atan/g
247 s/\<atanf32\>/flt32_atan/g
248 s/\<atanf64x\>/flt64x_atan/g
249 s/\<atanf64\>/flt64_atan/g
250 s/\<atanhd128x\>/dec128x_atanh/g
251 s/\<atanhd128\>/dec128_atanh/g
252 s/\<atanhd32\>/dec32_atanh/g
253 s/\<atanhd64x\>/dec64x_atanh/g
254 s/\<atanhd64\>/dec64_atanh/g
255 s/\<atanhf128x\>/flt128x_atanh/g
256 s/\<atanhf128\>/flt128_atanh/g
257 s/\<atanhf16\>/flt16_atanh/g
258 s/\<atanhf32x\>/flt32x_atanh/g
259 s/\<atanhf32\>/flt32_atanh/g
260 s/\<atanhf64x\>/flt64x_atanh/g
261 s/\<atanhf64\>/flt64_atanh/g
262 s/\<atanpid128x\>/dec128x_atanpi/g
263 s/\<atanpid128\>/dec128_atanpi/g
264 s/\<atanpid32\>/dec32_atanpi/g
265 s/\<atanpid64x\>/dec64x_atanpi/g
266 s/\<atanpid64\>/dec64_atanpi/g
267 s/\<atanpif128x\>/flt128x_atanpi/g
268 s/\<atanpif128\>/flt128_atanpi/g
269 s/\<atanpif16\>/flt16_atanpi/g
270 s/\<atanpif32x\>/flt32x_atanpi/g
271 s/\<atanpif32\>/flt32_atanpi/g
272 s/\<atanpif64x\>/flt64x_atanpi/g
273 s/\<atanpif64\>/flt64_atanpi/g
274 s/\<atanpif\>/flt_atanpi/g
275 s/\<atanpil\>/ldbl_atanpi/g
276 # no change for atanpi
277 # no change for CMPLXF128X
278 # no change for CMPLXF128
279 # no change for CMPLXF32X
280 # no change for CMPLXF32
281 # no change for CMPLXF64X
282 # no change for CMPLXF64
283 s/\<cabsf128x\>/flt128x_cabs/g
284 s/\<cabsf128\>/flt128_cabs/g
285 s/\<cabsf32x\>/flt32x_cabs/g
286 s/\<cabsf32\>/flt32_cabs/g
287 s/\<cabsf64x\>/flt64x_cabs/g
288 s/\<cabsf64\>/flt64_cabs/g
289 s/\<cacosf128x\>/flt128x_cacos/g
290 s/\<cacosf128\>/flt128_cacos/g
291 s/\<cacosf32x\>/flt32x_cacos/g
292 s/\<cacosf32\>/flt32_cacos/g
293 s/\<cacosf64x\>/flt64x_cacos/g
294 s/\<cacosf64\>/flt64_cacos/g
295 s/\<cacoshf128x\>/flt128x_cacosh/g
296 s/\<cacoshf128\>/flt128_cacosh/g
297 s/\<cacoshf32x\>/flt32x_cacosh/g
298 s/\<cacoshf32\>/flt32_cacosh/g
299 s/\<cacoshf64x\>/flt64x_cacosh/g
300 s/\<cacoshf64\>/flt64_cacosh/g
301 # no change for cacospi
302 s/\<canonicalized128x\>/dec128x_canonicalize/g
303 s/\<canonicalized128\>/dec128_canonicalize/g
304 s/\<canonicalized32\>/dec32_canonicalize/g
```

```
s/\<canonicalized64x\>/dec64x_canonicalize/g
s/\<canonicalized64\>/dec64_canonicalize/g
s/\<canonicalizef128x\>/flt128x_canonicalize/g
s/\<canonicalizef128\>/flt128_canonicalize/g
s/\<canonicalizef16\>/flt16_canonicalize/g
s/\<canonicalizef32x\>/flt32x_canonicalize/g
s/\<canonicalizef32\>/flt32_canonicalize/g
s/\<canonicalizef64x\>/flt64x_canonicalize/g
s/\<canonicalizef64\>/flt64_canonicalize/g
s/\<canonicalizef\>/flt_canonicalize/g
s/\<canonicalizel\>/ldbl_canonicalize/g
# no change for canonicalize
s/\<cargf128x\>/flt128x_carg/g
s/\<cargf128\>/flt128_carg/g
s/\<cargf32x\>/flt32x_carg/g
s/\<cargf32\>/flt32_carg/g
s/\<cargf64x\>/flt64x_carg/g
s/\<cargf64\>/flt64_carg/g
s/\<casinf128x\>/flt128x_casin/g
s/\<casinf128\>/flt128_casin/g
s/\<casinf32x\>/flt32x_casin/g
s/\<casinf32\>/flt32_casin/g
s/\<casinf64x\>/flt64x_casin/g
s/\<casinf64\>/flt64_casin/g
s/\<casinhf128x\>/flt128x_casinh/g
s/\<casinhf128\>/flt128_casinh/g
s/\<casinhf32x\>/flt32x_casinh/g
s/\<casinhf32\>/flt32_casinh/g
s/\<casinhf64x\>/flt64x_casinh/g
s/\<casinhf64\>/flt64_casinh/g
# no change for casinpi
s/\<catanf128x\>/flt128x_catan/g
s/\<catanf128\>/flt128_catan/g
s/\<catanf32x\>/flt32x_catan/g
s/\<catanf32\>/flt32_catan/g
s/\<catanf64x\>/flt64x_catan/g
s/\<catanf64\>/flt64_catan/g
s/\<catanhf128x\>/flt128x_catanh/g
s/\<catanhf128\>/flt128_catanh/g
s/\<catanhf32x\>/flt32x_catanh/g
s/\<catanhf32\>/flt32_catanh/g
s/\<catanhf64x\>/flt64x_catanh/g
s/\<catanhf64\>/flt64_catanh/g
# no change for catanpi
s/\<cbrtd128x\>/dec128x_cbrt/g
s/\<cbrtd128\>/dec128_cbrt/g
s/\<cbrtd32\>/dec32_cbrt/g
s/\<cbrtd64x\>/dec64x_cbrt/g
s/\<cbrtd64\>/dec64_cbrt/g
s/\<cbrtf128x\>/flt128x_cbrt/g
s/\<cbrtf128\>/flt128_cbrt/g
s/\<cbrtf16\>/flt16_cbrt/g
s/\<cbrtf32x\>/flt32x_cbrt/g
s/\<cbrtf32\>/flt32_cbrt/g
s/\<cbrtf64x\>/flt64x_cbrt/g
s/\<cbrtf64\>/flt64_cbrt/g
# no change for ccompoundn
s/\<ccosf128x\>/flt128x_ccos/g
s/\<ccosf128\>/flt128_ccos/g
s/\<ccosf32x\>/flt32x_ccos/g
s/\<ccosf32\>/flt32_ccos/g
s/\<ccosf64x\>/flt64x_ccos/g
s/\<ccosf64\>/flt64_ccos/g
```

```
s/\<ccoshf128x\>/flt128x_ccosh/g
s/\<ccoshf128\>/flt128_ccosh/g
s/\<ccoshf32x\>/flt32x_ccosh/g
s/\<ccoshf32\>/flt32_ccosh/g
s/\<ccoshf64x\>/flt64x_ccosh/g
s/\<ccoshf64\>/flt64_ccosh/g
# no change for ccospi
s/\<ceild128x\>/dec128x_ceil/g
s/\<ceild128\>/dec128_ceil/g
s/\<ceild32\>/dec32_ceil/g
s/\<ceild64x\>/dec64x_ceil/g
s/\<ceild64\>/dec64_ceil/g
s/\<ceilf128x\>/flt128x_ceil/g
s/\<ceilf128\>/flt128_ceil/g
s/\<ceilf16\>/flt16_ceil/g
s/\<ceilf32x\>/flt32x_ceil/g
s/\<ceilf32\>/flt32_ceil/g
s/\<ceilf64x\>/flt64x_ceil/g
s/\<ceilf64\>/flt64_ceil/g
# no change for cexp10m1
# no change for cexp10
# no change for cexp2m1
s/\<cexpf128x\>/flt128x_cexp/g
s/\<cexpf128\>/flt128_cexp/g
s/\<cexpf32x\>/flt32x_cexp/g
s/\<cexpf32\>/flt32_cexp/g
s/\<cexpf64x\>/flt64x_cexp/g
s/\<cexpf64\>/flt64_cexp/g
s/\<cimagf128x\>/flt128x_cimag/g
s/\<cimagf128\>/flt128_cimag/g
s/\<cimagf32x\>/flt32x_cimag/g
s/\<cimagf32\>/flt32_cimag/g
s/\<cimagf64x\>/flt64x_cimag/g
s/\<cimagf64\>/flt64_cimag/g
# no change for clog10p1
# no change for clog2p1
s/\<clogf128x\>/flt128x_clog/g
s/\<clogf128\>/flt128_clog/g
s/\<clogf32x\>/flt32x_clog/g
s/\<clogf32\>/flt32_clog/g
s/\<clogf64x\>/flt64x_clog/g
s/\<clogf64\>/flt64_clog/g
# no change for clogp1
s/\<compoundnd128x\>/dec128x_compoundn/g
s/\<compoundnd128\>/dec128_compoundn/g
s/\<compoundnd32\>/dec32_compoundn/g
s/\<compoundnd64x\>/dec64x_compoundn/g
s/\<compoundnd64\>/dec64_compoundn/g
s/\<compoundnf128x\>/flt128x_compoundn/g
s/\<compoundnf128\>/flt128_compoundn/g
s/\<compoundnf16\>/flt16_compoundn/g
s/\<compoundnf32x\>/flt32x_compoundn/g
s/\<compoundnf32\>/flt32_compoundn/g
s/\<compoundnf64x\>/flt64x_compoundn/g
s/\<compoundnf64\>/flt64_compoundn/g
s/\<compoundnf\>/flt_compoundn/g
s/\<compoundnl\>/ldbl_compoundn/g
# no change for compoundn
s/\<conjf128x\>/flt128x_conj/g
s/\<conjf128\>/flt128_conj/g
s/\<conjf32x\>/flt32x_conj/g
s/\<conjf32\>/flt32_conj/g
s/\<conjf64x\>/flt64x_conj/g
```

```
s/\<conjf64\>/flt64_conj/g
s/\<copysignd128x\>/dec128x_copysign/g
s/\<copysignd128\>/dec128_copysign/g
s/\<copysignd32\>/dec32_copysign/g
s/\<copysignd64x\>/dec64x_copysign/g
s/\<copysignd64\>/dec64_copysign/g
s/\<copysignf128x\>/flt128x_copysign/g
s/\<copysignf128\>/flt128_copysign/g
s/\<copysignf16\>/flt16_copysign/g
s/\<copysignf32x\>/flt32x_copysign/g
s/\<copysignf32\>/flt32_copysign/g
s/\<copysignf64x\>/flt64x_copysign/g
s/\<copysignf64\>/flt64_copysign/g
s/\<cosd128x\>/dec128x_cos/g
s/\<cosd128\>/dec128_cos/g
s/\<cosd32\>/dec32_cos/g
s/\<cosd64x\>/dec64x_cos/g
s/\<cosd64\>/dec64_cos/g
s/\<cosf128x\>/flt128x_cos/g
s/\<cosf128\>/flt128_cos/g
s/\<cosf16\>/flt16_cos/g
s/\<cosf32x\>/flt32x_cos/g
s/\<cosf32\>/flt32_cos/g
s/\<cosf64x\>/flt64x_cos/g
s/\<cosf64\>/flt64_cos/g
s/\<coshd128x\>/dec128x_cosh/g
s/\<coshd128\>/dec128_cosh/g
s/\<coshd32\>/dec32_cosh/g
s/\<coshd64x\>/dec64x_cosh/g
s/\<coshd64\>/dec64_cosh/g
s/\<coshf128x\>/flt128x_cosh/g
s/\<coshf128\>/flt128_cosh/g
s/\<coshf16\>/flt16_cosh/g
s/\<coshf32x\>/flt32x_cosh/g
s/\<coshf32\>/flt32_cosh/g
s/\<coshf64x\>/flt64x_cosh/g
s/\<coshf64\>/flt64_cosh/g
s/\<cospid128x\>/dec128x_cospi/g
s/\<cospid128\>/dec128_cospi/g
s/\<cospid32\>/dec32_cospi/g
s/\<cospid64x\>/dec64x_cospi/g
s/\<cospid64\>/dec64_cospi/g
s/\<cospif128x\>/flt128x_cospi/g
s/\<cospif128\>/flt128_cospi/g
s/\<cospif16\>/flt16_cospi/g
s/\<cospif32x\>/flt32x_cospi/g
s/\<cospif32\>/flt32_cospi/g
s/\<cospif64x\>/flt64x_cospi/g
s/\<cospif64\>/flt64_cospi/g
s/\<cospif\>/flt_cospi/g
s/\<cospil\>/ldbl_cospi/g
# no change for cospi
s/\<cpowf128x\>/flt128x_cpow/g
s/\<cpowf128\>/flt128_cpow/g
s/\<cpowf32x\>/flt32x_cpow/g
s/\<cpowf32\>/flt32_cpow/g
s/\<cpowf64x\>/flt64x_cpow/g
s/\<cpowf64\>/flt64_cpow/g
# no change for cpown
# no change for cpowr
s/\<cprojf128x\>/flt128x_cproj/g
s/\<cprojf128\>/flt128_cproj/g
s/\<cprojf32x\>/flt32x_cproj/g
```

```
494 s/\<cprojf32\>/flt32_cproj/g
495 s/\<cprojf64x\>/flt64x_cproj/g
496 s/\<cprojf64\>/flt64_cproj/g
497 # no change for cracosh
498 # no change for cracospi
499 # no change for cracos
500 # no change for crasinh
501 # no change for crasinpi
502 # no change for crasin
503 # no change for cratan2pi
504 # no change for cratan2
505 # no change for cratanh
506 # no change for cratanpi
507 # no change for cratan
508 # no change for crcompoundn
509 # no change for crcosh
510 # no change for crcospi
511 # no change for crcos
512 s/\<crealf128x\>/flt128x_creal/g
513 s/\<crealf128\>/flt128_creal/g
514 s/\<crealf32x\>/flt32x_creal/g
515 s/\<crealf32\>/flt32_creal/g
516 s/\<crealf64x\>/flt64x_creal/g
517 s/\<crealf64\>/flt64_creal/g
518 # no change for crexp10m1
519 # no change for crexp10
520 # no change for crexp2m1
521 # no change for crexp2
522 # no change for crexpm1
523 # no change for crexp
524 # no change for crhypot
525 # no change for crlog10p1
526 # no change for crlog10
527 # no change for crlog1p
528 # no change for crlog2p1
529 # no change for crlog2
530 # no change for crlogp1
531 # no change for crlog
532 # no change for crootn
533 # no change for crpown
534 # no change for crpowr
535 # no change for crpow
536 # no change for crrootn
537 # no change for crrsqrt
538 # no change for crsinh
539 # no change for crsinpi
540 # no change for crsin
541 # no change for crsqrt
542 # no change for crtanh
543 # no change for crtanpi
544 # no change for crtan
545 s/\<csinf128x\>/flt128x_csin/g
546 s/\<csinf128\>/flt128_csin/g
547 s/\<csinf32x\>/flt32x_csin/g
548 s/\<csinf32\>/flt32_csin/g
549 s/\<csinf64x\>/flt64x_csin/g
550 s/\<csinf64\>/flt64_csin/g
551 s/\<csinhf128x\>/flt128x_csinh/g
552 s/\<csinhf128\>/flt128_csinh/g
553 s/\<csinhf32x\>/flt32x_csinh/g
554 s/\<csinhf32\>/flt32_csinh/g
555 s/\<csinhf64x\>/flt64x_csinh/g
556 s/\<csinhf64\>/flt64_csinh/g
```

```
# no change for csinpi
s/\<csqrtf128x\>/flt128x_csqrt/g
s/\<csqrtf128\>/flt128_csqrt/g
s/\<csqrtf32x\>/flt32x_csqrt/g
s/\<csqrtf32\>/flt32_csqrt/g
s/\<csqrtf64x\>/flt64x_csqrt/g
s/\<csqrtf64\>/flt64_csqrt/g
s/\<ctanf128x\>/flt128x_ctan/g
s/\<ctanf128\>/flt128_ctan/g
s/\<ctanf32x\>/flt32x_ctan/g
s/\<ctanf32\>/flt32_ctan/g
s/\<ctanf64x\>/flt64x_ctan/g
s/\<ctanf64\>/flt64_ctan/g
s/\<ctanhf128x\>/flt128x_ctanh/g
s/\<ctanhf128\>/flt128_ctanh/g
s/\<ctanhf32x\>/flt32x_ctanh/g
s/\<ctanhf32\>/flt32_ctanh/g
s/\<ctanhf64x\>/flt64x_ctanh/g
s/\<ctanhf64\>/flt64_ctanh/g
# no change for ctanpi
s/\<d128addd128x\>/dec128x_todec128_add/g
s/\<d128add\>/todec128_add/g
s/\<d128divd128x\>/dec128x_todec128_div/g
s/\<d128div\>/todec128_div/g
s/\<d128fmad128x\>/dec128x_todec128_fma/g
s/\<d128fma\>/todec128_fma/g
s/\<d128muld128x\>/dec128x_todec128_mul/g
s/\<d128mul\>/todec128_mul/g
s/\<d128sqrtd128x\>/dec128x_todec128_sqrt/g
s/\<d128sqrt\>/todec128_sqrt/g
s/\<d128subd128x\>/dec128x_todec128_sub/g
s/\<d128sub\>/todec128_sub/g
s/\<d32addd128x\>/dec128x_todec32_add/g
s/\<d32addd128\>/dec128_todec32_add/g
s/\<d32addd64x\>/dec64x_todec32_add/g
s/\<d32addd64\>/dec64_todec32_add/g
s/\<d32add\>/todec32_add/g
s/\<d32divd128x\>/dec128x_todec32_div/g
s/\<d32divd128\>/dec128_todec32_div/g
s/\<d32divd64x\>/dec64x_todec32_div/g
s/\<d32divd64\>/dec64_todec32_div/g
s/\<d32div\>/todec32_div/g
s/\<d32fmad128x\>/dec128x_todec32_fma/g
s/\<d32fmad128\>/dec128_todec32_fma/g
s/\<d32fmad64x\>/dec64x_todec32_fma/g
s/\<d32fmad64\>/dec64_todec32_fma/g
s/\<d32fma\>/todec32_fma/g
s/\<d32muld128x\>/dec128x_todec32_mul/g
s/\<d32muld128\>/dec128_todec32_mul/g
s/\<d32muld64x\>/dec64x_todec32_mul/g
s/\<d32muld64\>/dec64_todec32_mul/g
s/\<d32mul\>/todec32_mul/g
s/\<d32sqrtd128x\>/dec128x_todec32_sqrt/g
s/\<d32sqrtd128\>/dec128_todec32_sqrt/g
s/\<d32sqrtd64x\>/dec64x_todec32_sqrt/g
s/\<d32sqrtd64\>/dec64_todec32_sqrt/g
s/\<d32sqrt\>/todec32_sqrt/g
s/\<d32subd128x\>/dec128x_todec32_sub/g
s/\<d32subd128\>/dec128_todec32_sub/g
s/\<d32subd64x\>/dec64x_todec32_sub/g
s/\<d32subd64\>/dec64_todec32_sub/g
s/\<d32sub\>/todec32_sub/g
s/\<d64addd128x\>/dec128x_todec64_add/g
```

```
s/\<d64addd128\>/dec128_todec64_add/g
s/\<d64addd64x\>/dec64x_todec64_add/g
s/\<d64add\>/todec64_add/g
s/\<d64divd128x\>/dec128x_todec64_div/g
s/\<d64divd128\>/dec128_todec64_div/g
s/\<d64divd64x\>/dec64x_todec64_div/g
s/\<d64div\>/todec64_div/g
s/\<d64fmad128x\>/dec128x_todec64_fma/g
s/\<d64fmad128\>/dec128_todec64_fma/g
s/\<d64fmad64x\>/dec64x_todec64_fma/g
s/\<d64fma\>/todec64_fma/g
s/\<d64muld128x\>/dec128x_todec64_mul/g
s/\<d64muld128\>/dec128_todec64_mul/g
s/\<d64muld64x\>/dec64x_todec64_mul/g
s/\<d64mul\>/todec64_mul/g
s/\<d64sqrtd128x\>/dec128x_todec64_sqrt/g
s/\<d64sqrtd128\>/dec128_todec64_sqrt/g
s/\<d64sqrtd64x\>/dec64x_todec64_sqrt/g
s/\<d64sqrt\>/todec64_sqrt/g
s/\<d64subd128x\>/dec128x_todec64_sub/g
s/\<d64subd128\>/dec128_todec64_sub/g
s/\<d64subd64x\>/dec64x_todec64_sub/g
s/\<d64sub\>/todec64_sub/g
s/\<d64xaddd128x\>/dec128x_todec64x_add/g
s/\<d64xaddd128\>/dec128_todec64x_add/g
s/\<d64xadd\>/todec64x_add/g
s/\<d64xdivd128x\>/dec128x_todec64x_div/g
s/\<d64xdivd128\>/dec128_todec64x_div/g
s/\<d64xdiv\>/todec64x_div/g
s/\<d64xfmad128x\>/dec128x_todec64x_fma/g
s/\<d64xfmad128\>/dec128_todec64x_fma/g
s/\<d64xfma\>/todec64x_fma/g
s/\<d64xmuld128x\>/dec128x_todec64x_mul/g
s/\<d64xmuld128\>/dec128_todec64x_mul/g
s/\<d64xmul\>/todec64x_mul/g
s/\<d64xsqrtd128x\>/dec128x_todec64x_sqrt/g
s/\<d64xsqrtd128\>/dec128_todec64x_sqrt/g
s/\<d64xsqrt\>/todec64x_sqrt/g
s/\<d64xsubd128x\>/dec128x_todec64x_sub/g
s/\<d64xsubd128\>/dec128_todec64x_sub/g
s/\<d64xsub\>/todec64x_sub/g
s/\<daddl\>/ldbl_todbl_add/g
s/\<dadd\>/todbl_add/g
s/\<ddivl\>/ldbl_todbl_div/g
s/\<ddiv\>/todbl_div/g
s/\<decodebind128x\>/dec128x_decodebin/g
s/\<decodebind128\>/dec128_decodebin/g
s/\<decodebind32\>/dec32_decodebin/g
s/\<decodebind64x\>/dec64x_decodebin/g
s/\<decodebind64\>/dec64_decodebin/g
# no change for decodebin
s/\<decodedecd128x\>/dec128x_decodedec/g
s/\<decodedecd128\>/dec128_decodedec/g
s/\<decodedecd32\>/dec32_decodedec/g
s/\<decodedecd64x\>/dec64x_decodedec/g
s/\<decodedecd64\>/dec64_decodedec/g
# no change for decodedec
# no change for deprecated
s/\<dfmal\>/ldbl_todbl_fma/g
s/\<dfma\>/todbl_fma/g
s/\<dmull\>/ldbl_todbl_mul/g
s/\<dmul\>/todbl_mul/g
s/\<dsqrtl\>/ldbl_todbl_sqrt/g
```

```
s/\<dsqrt\>/todbl_sqrt/g
s/\<dsubl\>/ldbl_todbl_sub/g
s/\<dsub\>/todbl_sub/g
s/\<encodebind128x\>/dec128x_encodebin/g
s/\<encodebind128\>/dec128_encodebin/g
s/\<encodebind32\>/dec32_encodebin/g
s/\<encodebind64x\>/dec64x_encodebin/g
s/\<encodebind64\>/dec64_encodebin/g
# no change for encodebin
s/\<encodedecd128x\>/dec128x_encodedec/g
s/\<encodedecd128\>/dec128_encodedec/g
s/\<encodedecd32\>/dec32_encodedec/g
s/\<encodedecd64x\>/dec64x_encodedec/g
s/\<encodedecd64\>/dec64_encodedec/g
# no change for encodedec
s/\<erfcd128x\>/dec128x_erfc/g
s/\<erfcd128\>/dec128_erfc/g
s/\<erfcd32\>/dec32_erfc/g
s/\<erfcd64x\>/dec64x_erfc/g
s/\<erfcd64\>/dec64_erfc/g
s/\<erfcf128x\>/flt128x_erfc/g
s/\<erfcf128\>/flt128_erfc/g
s/\<erfcf16\>/flt16_erfc/g
s/\<erfcf32x\>/flt32x_erfc/g
s/\<erfcf32\>/flt32_erfc/g
s/\<erfcf64x\>/flt64x_erfc/g
s/\<erfcf64\>/flt64_erfc/g
s/\<erfd128x\>/dec128x_erf/g
s/\<erfd128\>/dec128_erf/g
s/\<erfd32\>/dec32_erf/g
s/\<erfd64x\>/dec64x_erf/g
s/\<erfd64\>/dec64_erf/g
s/\<erff128x\>/flt128x_erf/g
s/\<erff128\>/flt128_erf/g
s/\<erff16\>/flt16_erf/g
s/\<erff32x\>/flt32x_erf/g
s/\<erff32\>/flt32_erf/g
s/\<erff64x\>/flt64x_erf/g
s/\<erff64\>/flt64_erf/g
s/\<exp10d128x\>/dec128x_exp10/g
s/\<exp10d128\>/dec128_exp10/g
s/\<exp10d32\>/dec32_exp10/g
s/\<exp10d64x\>/dec64x_exp10/g
s/\<exp10d64\>/dec64_exp10/g
s/\<exp10f128x\>/flt128x_exp10/g
s/\<exp10f128\>/flt128_exp10/g
s/\<exp10f32x\>/flt32x_exp10/g
s/\<exp10f32\>/flt32_exp10/g
s/\<exp10f64x\>/flt64x_exp10/g
s/\<exp10f64\>/flt64_exp10/g
s/\<exp10f\>/flt_exp10/g
s/\<exp10l\>/ldbl_exp10/g
s/\<exp10m1d128x\>/dec128x_exp10m1/g
s/\<exp10m1d128\>/dec128_exp10m1/g
s/\<exp10m1d32\>/dec32_exp10m1/g
s/\<exp10m1d64x\>/dec64x_exp10m1/g
s/\<exp10m1d64\>/dec64_exp10m1/g
s/\<exp10m1f128x\>/flt128x_exp10m1/g
s/\<exp10m1f128\>/flt128_exp10m1/g
s/\<exp10m1f32x\>/flt32x_exp10m1/g
s/\<exp10m1f32\>/flt32_exp10m1/g
s/\<exp10m1f64x\>/flt64x_exp10m1/g
s/\<exp10m1f64\>/flt64_exp10m1/g
```

```
746 s/\<exp10m1f\>/flt_exp10m1/g
747 s/\<exp10m1l\>/ldbl_exp10m1/g
748 # no change for exp10m1
749 # no change for exp10
750 s/\<exp2d128x\>/dec128x_exp2/g
751 s/\<exp2d128\>/dec128_exp2/g
752 s/\<exp2d32\>/dec32_exp2/g
753 s/\<exp2d64x\>/dec64x_exp2/g
754 s/\<exp2d64\>/dec64_exp2/g
755 s/\<exp2f128x\>/flt128x_exp2/g
756 s/\<exp2f128\>/flt128_exp2/g
757 s/\<exp2f32x\>/flt32x_exp2/g
758 s/\<exp2f32\>/flt32_exp2/g
759 s/\<exp2f64x\>/flt64x_exp2/g
760 s/\<exp2f64\>/flt64_exp2/g
761 s/\<exp2m1d128x\>/dec128x_exp2m1/g
762 s/\<exp2m1d128\>/dec128_exp2m1/g
763 s/\<exp2m1d32\>/dec32_exp2m1/g
764 s/\<exp2m1d64x\>/dec64x_exp2m1/g
765 s/\<exp2m1d64\>/dec64_exp2m1/g
766 s/\<exp2m1f128x\>/flt128x_exp2m1/g
767 s/\<exp2m1f128\>/flt128_exp2m1/g
768 s/\<exp2m1f32x\>/flt32x_exp2m1/g
769 s/\<exp2m1f32\>/flt32_exp2m1/g
770 s/\<exp2m1f64x\>/flt64x_exp2m1/g
771 s/\<exp2m1f64\>/flt64_exp2m1/g
772 s/\<exp2m1f\>/flt_exp2m1/g
773 s/\<exp2m1l\>/ldbl_exp2m1/g
774 # no change for exp2m1
775 s/\<expd128x\>/dec128x_exp/g
776 s/\<expd128\>/dec128_exp/g
777 s/\<expd32\>/dec32_exp/g
778 s/\<expd64x\>/dec64x_exp/g
779 s/\<expd64\>/dec64_exp/g
780 s/\<expf128x\>/flt128x_exp/g
781 s/\<expf128\>/flt128_exp/g
782 s/\<expf16\>/flt16_exp/g
783 s/\<expf32x\>/flt32x_exp/g
784 s/\<expf32\>/flt32_exp/g
785 s/\<expf64x\>/flt64x_exp/g
786 s/\<expf64\>/flt64_exp/g
787 s/\<expm1d128x\>/dec128x_expm1/g
788 s/\<expm1d128\>/dec128_expm1/g
789 s/\<expm1d32\>/dec32_expm1/g
790 s/\<expm1d64x\>/dec64x_expm1/g
791 s/\<expm1d64\>/dec64_expm1/g
792 s/\<expm1f128x\>/flt128x_expm1/g
793 s/\<expm1f128\>/flt128_expm1/g
794 s/\<expm1f32x\>/flt32x_expm1/g
795 s/\<expm1f32\>/flt32_expm1/g
796 s/\<expm1f64x\>/flt64x_expm1/g
797 s/\<expm1f64\>/flt64_expm1/g
798 s/\<f128addf128x\>/flt128x_toflt128_add/g
799 s/\<f128add\>/toflt128_add/g
800 s/\<f128divf128x\>/flt128x_toflt128_div/g
801 s/\<f128div\>/toflt128_div/g
802 s/\<f128fmaf128x\>/flt128x_toflt128_fma/g
803 s/\<f128fma\>/toflt128_fma/g
804 s/\<f128mulf128x\>/flt128x_toflt128_mul/g
805 s/\<f128mul\>/toflt128_mul/g
806 s/\<f128sqrtf128x\>/flt128x_toflt128_sqrt/g
807 s/\<f128sqrt\>/toflt128_sqrt/g
808 s/\<f128subf128x\>/flt128x_toflt128_sub/g
```

```
s/\<f128sub\>/toflt128_sub/g
s/\<f16addf128x\>/flt128x_toflt16_add/g
s/\<f16addf128\>/flt128_toflt16_add/g
s/\<f16addf32x\>/flt32x_toflt16_add/g
s/\<f16addf32\>/flt32_toflt16_add/g
s/\<f16addf64x\>/flt64x_toflt16_add/g
s/\<f16addf64\>/flt64_toflt16_add/g
s/\<f16add\>/toflt16_add/g
s/\<f16divf128x\>/flt128x_toflt16_div/g
s/\<f16divf128\>/flt128_toflt16_div/g
s/\<f16divf32x\>/flt32x_toflt16_div/g
s/\<f16divf32\>/flt32_toflt16_div/g
s/\<f16divf64x\>/flt64x_toflt16_div/g
s/\<f16divf64\>/flt64_toflt16_div/g
s/\<f16div\>/toflt16_div/g
s/\<f16fmaf128x\>/flt128x_toflt16_fma/g
s/\<f16fmaf128\>/flt128_toflt16_fma/g
s/\<f16fmaf32x\>/flt32x_toflt16_fma/g
s/\<f16fmaf32\>/flt32_toflt16_fma/g
s/\<f16fmaf64x\>/flt64x_toflt16_fma/g
s/\<f16fmaf64\>/flt64_toflt16_fma/g
s/\<f16fma\>/toflt16_fma/g
s/\<f16mulf128x\>/flt128x_toflt16_mul/g
s/\<f16mulf128\>/flt128_toflt16_mul/g
s/\<f16mulf32x\>/flt32x_toflt16_mul/g
s/\<f16mulf32\>/flt32_toflt16_mul/g
s/\<f16mulf64x\>/flt64x_toflt16_mul/g
s/\<f16mulf64\>/flt64_toflt16_mul/g
s/\<f16mul\>/toflt16_mul/g
s/\<f16sqrtf128x\>/flt128x_toflt16_sqrt/g
s/\<f16sqrtf128\>/flt128_toflt16_sqrt/g
s/\<f16sqrtf32x\>/flt32x_toflt16_sqrt/g
s/\<f16sqrtf32\>/flt32_toflt16_sqrt/g
s/\<f16sqrtf64x\>/flt64x_toflt16_sqrt/g
s/\<f16sqrtf64\>/flt64_toflt16_sqrt/g
s/\<f16sqrt\>/toflt16_sqrt/g
s/\<f16subf128x\>/flt128x_toflt16_sub/g
s/\<f16subf128\>/flt128_toflt16_sub/g
s/\<f16subf32x\>/flt32x_toflt16_sub/g
s/\<f16subf32\>/flt32_toflt16_sub/g
s/\<f16subf64x\>/flt64x_toflt16_sub/g
s/\<f16subf64\>/flt64_toflt16_sub/g
s/\<f16sub\>/toflt16_sub/g
s/\<f32addf128x\>/flt128x_toflt32_add/g
s/\<f32addf128\>/flt128_toflt32_add/g
s/\<f32addf32x\>/flt32x_toflt32_add/g
s/\<f32addf64x\>/flt64x_toflt32_add/g
s/\<f32addf64\>/flt64_toflt32_add/g
s/\<f32add\>/toflt32_add/g
s/\<f32divf128x\>/flt128x_toflt32_div/g
s/\<f32divf128\>/flt128_toflt32_div/g
s/\<f32divf32x\>/flt32x_toflt32_div/g
s/\<f32divf64x\>/flt64x_toflt32_div/g
s/\<f32divf64\>/flt64_toflt32_div/g
s/\<f32div\>/toflt32_div/g
s/\<f32fmaf128x\>/flt128x_toflt32_fma/g
s/\<f32fmaf128\>/flt128_toflt32_fma/g
s/\<f32fmaf32x\>/flt32x_toflt32_fma/g
s/\<f32fmaf64x\>/flt64x_toflt32_fma/g
s/\<f32fmaf64\>/flt64_toflt32_fma/g
s/\<f32fma\>/toflt32_fma/g
s/\<f32mulf128x\>/flt128x_toflt32_mul/g
s/\<f32mulf128\>/flt128_toflt32_mul/g
```

```
872 s/\<f32mulf32x\>/flt32x_toflt32_mul/g
873 s/\<f32mulf64x\>/flt64x_toflt32_mul/g
874 s/\<f32mulf64\>/flt64_toflt32_mul/g
875 s/\<f32mul\>/toflt32_mul/g
876 s/\<f32sqrtf128x\>/flt128x_toflt32_sqrt/g
877 s/\<f32sqrtf128\>/flt128_toflt32_sqrt/g
878 s/\<f32sqrtf32x\>/flt32x_toflt32_sqrt/g
879 s/\<f32sqrtf64x\>/flt64x_toflt32_sqrt/g
880 s/\<f32sqrtf64\>/flt64_toflt32_sqrt/g
881 s/\<f32sqrt\>/toflt32_sqrt/g
882 s/\<f32subf128x\>/flt128x_toflt32_sub/g
883 s/\<f32subf128\>/flt128_toflt32_sub/g
884 s/\<f32subf32x\>/flt32x_toflt32_sub/g
885 s/\<f32subf64x\>/flt64x_toflt32_sub/g
886 s/\<f32subf64\>/flt64_toflt32_sub/g
887 s/\<f32sub\>/toflt32_sub/g
888 s/\<f32xaddf128x\>/flt128x_toflt32x_add/g
889 s/\<f32xaddf128\>/flt128_toflt32x_add/g
890 s/\<f32xaddf64x\>/flt64x_toflt32x_add/g
891 s/\<f32xaddf64\>/flt64_toflt32x_add/g
892 s/\<f32xadd\>/toflt32x_add/g
893 s/\<f32xdivf128x\>/flt128x_toflt32x_div/g
894 s/\<f32xdivf128\>/flt128_toflt32x_div/g
895 s/\<f32xdivf64x\>/flt64x_toflt32x_div/g
896 s/\<f32xdivf64\>/flt64_toflt32x_div/g
897 s/\<f32xdiv\>/toflt32x_div/g
898 s/\<f32xfmaf128x\>/flt128x_toflt32x_fma/g
899 s/\<f32xfmaf128\>/flt128_toflt32x_fma/g
900 s/\<f32xfmaf64x\>/flt64x_toflt32x_fma/g
901 s/\<f32xfmaf64\>/flt64_toflt32x_fma/g
902 s/\<f32xfma\>/toflt32x_fma/g
903 s/\<f32xmulf128x\>/flt128x_toflt32x_mul/g
904 s/\<f32xmulf128\>/flt128_toflt32x_mul/g
905 s/\<f32xmulf64x\>/flt64x_toflt32x_mul/g
906 s/\<f32xmulf64\>/flt64_toflt32x_mul/g
907 s/\<f32xmul\>/toflt32x_mul/g
908 s/\<f32xsqrtf128x\>/flt128x_toflt32x_sqrt/g
909 s/\<f32xsqrtf128\>/flt128_toflt32x_sqrt/g
910 s/\<f32xsqrtf64x\>/flt64x_toflt32x_sqrt/g
911 s/\<f32xsqrtf64\>/flt64_toflt32x_sqrt/g
912 s/\<f32xsqrt\>/toflt32x_sqrt/g
913 s/\<f32xsubf128x\>/flt128x_toflt32x_sub/g
914 s/\<f32xsubf128\>/flt128_toflt32x_sub/g
915 s/\<f32xsubf64x\>/flt64x_toflt32x_sub/g
916 s/\<f32xsubf64\>/flt64_toflt32x_sub/g
917 s/\<f32xsub\>/toflt32x_sub/g
918 s/\<f64addf128x\>/flt128x_toflt64_add/g
919 s/\<f64addf64x\>/flt64x_toflt64_add/g
920 s/\<f64add\>/toflt64_add/g
921 s/\<f64divf128x\>/flt128x_toflt64_div/g
922 s/\<f64divf64x\>/flt64x_toflt64_div/g
923 s/\<f64div\>/toflt64_div/g
924 s/\<f64fmaf128x\>/flt128x_toflt64_fma/g
925 s/\<f64fmaf64x\>/flt64x_toflt64_fma/g
926 s/\<f64fma\>/toflt64_fma/g
927 s/\<f64mulf128x\>/flt128x_toflt64_mul/g
928 s/\<f64mulf64x\>/flt64x_toflt64_mul/g
929 s/\<f64mul\>/toflt64_mul/g
930 s/\<f64sqrtf128x\>/flt128x_toflt64_sqrt/g
931 s/\<f64sqrtf64x\>/flt64x_toflt64_sqrt/g
932 s/\<f64sqrt\>/toflt64_sqrt/g
933 s/\<f64subf128x\>/flt128x_toflt64_sub/g
934 s/\<f64subf64x\>/flt64x_toflt64_sub/g
```

```
s/\<f64sub\>/toflt64_sub/g
s/\<f64xaddf128x\>/flt128x_toflt64x_add/g
s/\<f64xadd\>/toflt64x_add/g
s/\<f64xdivf128x\>/flt128x_toflt64x_div/g
s/\<f64xdiv\>/toflt64x_div/g
s/\<f64xfmaf128x\>/flt128x_toflt64x_fma/g
s/\<f64xfma\>/toflt64x_fma/g
s/\<f64xmulf128x\>/flt128x_toflt64x_mul/g
s/\<f64xmul\>/toflt64x_mul/g
s/\<f64xsqrtf128x\>/flt128x_toflt64x_sqrt/g
s/\<f64xsqrt\>/toflt64x_sqrt/g
s/\<f64xsubf128x\>/flt128x_toflt64x_sub/g
s/\<f64xsub\>/toflt64x_sub/g
s/\<fabsd128x\>/dec128x_fabs/g
s/\<fabsd128\>/dec128_fabs/g
s/\<fabsd32\>/dec32_fabs/g
s/\<fabsd64x\>/dec64x_fabs/g
s/\<fabsd64\>/dec64_fabs/g
s/\<fabsf128x\>/flt128x_fabs/g
s/\<fabsf128\>/flt128_fabs/g
s/\<fabsf16\>/flt16_fabs/g
s/\<fabsf32x\>/flt32x_fabs/g
s/\<fabsf32\>/flt32_fabs/g
s/\<fabsf64x\>/flt64x_fabs/g
s/\<fabsf64\>/flt64_fabs/g
s/\<faddl\>/ldbl_toflt_add/g
s/\<fadd\>/toflt_add/g
s/\<fdimd128x\>/dec128x_fdim/g
s/\<fdimd128\>/dec128_fdim/g
s/\<fdimd32\>/dec32_fdim/g
s/\<fdimd64x\>/dec64x_fdim/g
s/\<fdimd64\>/dec64_fdim/g
s/\<fdimf128x\>/flt128x_fdim/g
s/\<fdimf128\>/flt128_fdim/g
s/\<fdimf16\>/flt16_fdim/g
s/\<fdimf32x\>/flt32x_fdim/g
s/\<fdimf32\>/flt32_fdim/g
s/\<fdimf64x\>/flt64x_fdim/g
s/\<fdimf64\>/flt64_fdim/g
s/\<fdivl\>/ldbl_toflt_div/g
s/\<fdiv\>/toflt_div/g
# no change for fe_dec_getround
# no change for fe_dec_setround
s/\<fegetmode\>/fe_getmode/g
# no change for femode_t
s/\<fesetexcept\>/fe_setexcept/g
s/\<fesetmode\>/fe_setmode/g
s/\<fetestexceptflag\>/fe_testexceptflag/g
s/\<ffmal\>/ldbl_toflt_fma/g
s/\<ffma\>/toflt_fma/g
s/\<floord128x\>/dec128x_floor/g
s/\<floord128\>/dec128_floor/g
s/\<floord32\>/dec32_floor/g
s/\<floorf128x\>/flt128x_floor/g
s/\<floorf16\>/flt16_floor/g
s/\<floorf32x\>/flt32x_floor/g
s/\<floorf32\>/flt32_floor/g
s/\<fmad128x\>/dec128x_fma/g
s/\<fmad128\>/dec128_fma/g
s/\<fmad32\>/dec32_fma/g
s/\<fmad64x\>/dec64x_fma/g
s/\<fmad64\>/dec64_fma/g
s/\<fmaf128x\>/flt128x_fma/g
```

```
s/\<fmaf128\>/flt128_fma/g
s/\<fmaf16\>/flt16_fma/g
s/\<fmaf32x\>/flt32x_fma/g
s/\<fmaf32\>/flt32_fma/g
s/\<fmaf64x\>/flt64x_fma/g
s/\<fmaf64\>/flt64_fma/g
s/\<fmaxd128x\>/dec128x_fmax/g
s/\<fmaxd128\>/dec128_fmax/g
s/\<fmaxd32\>/dec32_fmax/g
s/\<fmaxd64x\>/dec64x_fmax/g
s/\<fmaxd64\>/dec64_fmax/g
s/\<fmaxf128x\>/flt128x_fmax/g
s/\<fmaxf128\>/flt128_fmax/g
s/\<fmaxf16\>/flt16_fmax/g
s/\<fmaxf32x\>/flt32x_fmax/g
s/\<fmaxf32\>/flt32_fmax/g
s/\<fmaxf64x\>/flt64x_fmax/g
s/\<fmaxf64\>/flt64_fmax/g
s/\<fmaxmagd128x\>/dec128x_fmaxmag/g
s/\<fmaxmagd128\>/dec128_fmaxmag/g
s/\<fmaxmagd32\>/dec32_fmaxmag/g
s/\<fmaxmagd64x\>/dec64x_fmaxmag/g
s/\<fmaxmagd64\>/dec64_fmaxmag/g
s/\<fmaxmagf128x\>/flt128x_fmaxmag/g
s/\<fmaxmagf128\>/flt128_fmaxmag/g
s/\<fmaxmagf16\>/flt16_fmaxmag/g
s/\<fmaxmagf32x\>/flt32x_fmaxmag/g
s/\<fmaxmagf32\>/flt32_fmaxmag/g
s/\<fmaxmagf64x\>/flt64x_fmaxmag/g
s/\<fmaxmagf64\>/flt64_fmaxmag/g
s/\<fmaxmagf\>/flt_fmaxmag/g
s/\<fmaxmagl\>/ldbl_fmaxmag/g
# no change for fmaxmag
s/\<fmind128x\>/dec128x_fmin/g
s/\<fmind128\>/dec128_fmin/g
s/\<fmind32\>/dec32_fmin/g
s/\<fmind64x\>/dec64x_fmin/g
s/\<fmind64\>/dec64_fmin/g
s/\<fminf128x\>/flt128x_fmin/g
s/\<fminf128\>/flt128_fmin/g
s/\<fminf16\>/flt16_fmin/g
s/\<fminf32x\>/flt32x_fmin/g
s/\<fminf32\>/flt32_fmin/g
s/\<fminf64x\>/flt64x_fmin/g
s/\<fminf64\>/flt64_fmin/g
s/\<fminmagd128x\>/dec128x_fminmag/g
s/\<fminmagd128\>/dec128_fminmag/g
s/\<fminmagd32\>/dec32_fminmag/g
s/\<fminmagd64x\>/dec64x_fminmag/g
s/\<fminmagd64\>/dec64_fminmag/g
s/\<fminmagf128x\>/flt128x_fminmag/g
s/\<fminmagf128\>/flt128_fminmag/g
s/\<fminmagf16\>/flt16_fminmag/g
s/\<fminmagf32x\>/flt32x_fminmag/g
s/\<fminmagf32\>/flt32_fminmag/g
s/\<fminmagf64x\>/flt64x_fminmag/g
s/\<fminmagf64\>/flt64_fminmag/g
s/\<fminmagf\>/flt_fminmag/g
s/\<fminmagl\>/ldbl_fminmag/g
# no change for fminmag
s/\<fmodd128x\>/dec128x_fmod/g
s/\<fmodd128\>/dec128_fmod/g
s/\<fmodd32\>/dec32_fmod/g
```

```
s/\<fmodd64x\>/dec64x_fmod/g
s/\<fmodd64\>/dec64_fmod/g
s/\<fmodf128x\>/flt128x_fmod/g
s/\<fmodf128\>/flt128_fmod/g
s/\<fmodf16\>/flt16_fmod/g
s/\<fmodf32x\>/flt32x_fmod/g
s/\<fmodf32\>/flt32_fmod/g
s/\<fmodf64x\>/flt64x_fmod/g
s/\<fmodf64\>/flt64_fmod/g
s/\<fmull\>/ldbl_toflt_mul/g
s/\<fmul\>/toflt_mul/g
s/\<frexpd128x\>/dec128x_frexp/g
s/\<frexpd128\>/dec128_frexp/g
s/\<frexpd32\>/dec32_frexp/g
s/\<frexpd64x\>/dec64x_frexp/g
s/\<frexpd64\>/dec64_frexp/g
s/\<frexpf128x\>/flt128x_frexp/g
s/\<frexpf128\>/flt128_frexp/g
s/\<frexpf16\>/flt16_frexp/g
s/\<frexpf32x\>/flt32x_frexp/g
s/\<frexpf32\>/flt32_frexp/g
s/\<frexpf64x\>/flt64x_frexp/g
s/\<frexpf64\>/flt64_frexp/g
s/\<fromfpd128x\>/dec128x_toint/g
s/\<fromfpd128\>/dec128_toint/g
s/\<fromfpd32\>/dec32_toint/g
s/\<fromfpd64x\>/dec64x_toint/g
s/\<fromfpd64\>/dec64_toint/g
s/\<fromfpf128x\>/flt128x_toint/g
s/\<fromfpf128\>/flt128_toint/g
s/\<fromfpf16\>/flt16_toint/g
s/\<fromfpf32x\>/flt32x_toint/g
s/\<fromfpf32\>/flt32_toint/g
s/\<fromfpf64x\>/flt64x_toint/g
s/\<fromfpf64\>/flt64_toint/g
s/\<fromfpf\>/flt_toint/g
s/\<fromfpl\>/ldbl_toint/g
s/\<fromfpxd128x\>/dec128x_tointx/g
s/\<fromfpxd128\>/dec128_tointx/g
s/\<fromfpxd32\>/dec32_tointx/g
s/\<fromfpxd64x\>/dec64x_tointx/g
s/\<fromfpxd64\>/dec64_tointx/g
s/\<fromfpxf128x\>/flt128x_tointx/g
s/\<fromfpxf128\>/flt128_tointx/g
s/\<fromfpxf16\>/flt16_tointx/g
s/\<fromfpxf32x\>/flt32x_tointx/g
s/\<fromfpxf32\>/flt32_tointx/g
s/\<fromfpxf64x\>/flt64x_tointx/g
s/\<fromfpxf64\>/flt64_tointx/g
s/\<fromfpxf\>/flt_tointx/g
s/\<fromfpxl\>/ldbl_tointx/g
s/\<fromfpx\>/tointx/g
s/\<fromfp\>/toint/g
s/\<fsqrtl\>/ldbl_toflt_sqrt/g
s/\<fsqrt\>/toflt_sqrt/g
s/\<fsubl\>/ldbl_toflt_sub/g
s/\<fsub\>/toflt_sub/g
s/\<getpayloadd128x\>/dec128x_getpayload/g
s/\<getpayloadd128\>/dec128_getpayload/g
s/\<getpayloadd32\>/dec32_getpayload/g
s/\<getpayloadd64x\>/dec64x_getpayload/g
s/\<getpayloadd64\>/dec64_getpayload/g
s/\<getpayloadf128x\>/flt128x_getpayload/g
```

```
s/\<getpayloadf128\>/flt128_getpayload/g
s/\<getpayloadf16\>/flt16_getpayload/g
s/\<getpayloadf32x\>/flt32x_getpayload/g
s/\<getpayloadf32\>/flt32_getpayload/g
s/\<getpayloadf64x\>/flt64x_getpayload/g
s/\<getpayloadf64\>/flt64_getpayload/g
s/\<getpayloadf\>/flt_getpayload/g
s/\<getpayloadl\>/ldbl_getpayload/g
# no change for getpayload
s/\<hypotd128x\>/dec128x_hypot/g
s/\<hypotd128\>/dec128_hypot/g
s/\<hypotd32\>/dec32_hypot/g
s/\<hypotd64x\>/dec64x_hypot/g
s/\<hypotd64\>/dec64_hypot/g
s/\<hypotf128x\>/flt128x_hypot/g
s/\<hypotf128\>/flt128_hypot/g
s/\<hypotf16\>/flt16_hypot/g
s/\<hypotf32x\>/flt32x_hypot/g
s/\<hypotf32\>/flt32_hypot/g
s/\<hypotf64x\>/flt64x_hypot/g
s/\<hypotf64\>/flt64_hypot/g
s/\<ilogbd128x\>/dec128x_ilogb/g
s/\<ilogbd128\>/dec128_ilogb/g
s/\<ilogbd32\>/dec32_ilogb/g
s/\<ilogbd64x\>/dec64x_ilogb/g
s/\<ilogbd64\>/dec64_ilogb/g
s/\<ilogbf128x\>/flt128x_ilogb/g
s/\<ilogbf128\>/flt128_ilogb/g
s/\<ilogbf16\>/flt16_ilogb/g
s/\<ilogbf32x\>/flt32x_ilogb/g
s/\<ilogbf32\>/flt32_ilogb/g
s/\<ilogbf64x\>/flt64x_ilogb/g
s/\<ilogbf64\>/flt64_ilogb/g
s/\<ldexpd128x\>/dec128x_ldexp/g
s/\<ldexpd128\>/dec128_ldexp/g
s/\<ldexpd32\>/dec32_ldexp/g
s/\<ldexpd64x\>/dec64x_ldexp/g
s/\<ldexpd64\>/dec64_ldexp/g
s/\<ldexpf128x\>/flt128x_ldexp/g
s/\<ldexpf128\>/flt128_ldexp/g
s/\<ldexpf16\>/flt16_ldexp/g
s/\<ldexpf32x\>/flt32x_ldexp/g
s/\<ldexpf32\>/flt32_ldexp/g
s/\<ldexpf64x\>/flt64x_ldexp/g
s/\<ldexpf64\>/flt64_ldexp/g
s/\<lgammad128x\>/dec128x_lgamma/g
s/\<lgammad128\>/dec128_lgamma/g
s/\<lgammad32\>/dec32_lgamma/g
s/\<lgammad64x\>/dec64x_lgamma/g
s/\<lgammad64\>/dec64_lgamma/g
s/\<lgammaf128x\>/flt128x_lgamma/g
s/\<lgammaf128\>/flt128_lgamma/g
s/\<lgammaf16\>/flt16_lgamma/g
s/\<lgammaf32x\>/flt32x_lgamma/g
s/\<lgammaf32\>/flt32_lgamma/g
s/\<lgammaf64x\>/flt64x_lgamma/g
s/\<lgammaf64\>/flt64_lgamma/g
s/\<llogbd128x\>/dec128x_toint_logb/g
s/\<llogbd128\>/dec128_toint_logb/g
s/\<llogbd32\>/dec32_toint_logb/g
s/\<llogbd64x\>/dec64x_toint_logb/g
s/\<llogbd64\>/dec64_toint_logb/g
s/\<llogbf128x\>/flt128x_toint_logb/g
```

```
s/\<llogbf128\>/flt128_toint_logb/g
s/\<llogbf16\>/flt16_toint_logb/g
s/\<llogbf32x\>/flt32x_toint_logb/g
s/\<llogbf32\>/flt32_toint_logb/g
s/\<llogbf64x\>/flt64x_toint_logb/g
s/\<llogbf64\>/flt64_toint_logb/g
s/\<llogbf\>/flt_toint_logb/g
s/\<llogbl\>/ldbl_toint_logb/g
s/\<llogb\>/toint_logb/g
s/\<llquantexpd128x\>/dec128x_toint_quantexp/g
s/\<llquantexpd128\>/dec128_toint_quantexp/g
s/\<llquantexpd32\>/dec32_toint_quantexp/g
s/\<llquantexpd64x\>/dec64x_toint_quantexp/g
s/\<llquantexpd64\>/dec64_toint_quantexp/g
s/\<llquantexpf128x\>/flt128x_toint_quantexp/g
s/\<llquantexpf128\>/flt128_toint_quantexp/g
s/\<llquantexpf16\>/flt16_toint_quantexp/g
s/\<llquantexpf32x\>/flt32x_toint_quantexp/g
s/\<llquantexpf32\>/flt32_toint_quantexp/g
s/\<llquantexpf64x\>/flt64x_toint_quantexp/g
s/\<llquantexpf64\>/flt64_toint_quantexp/g
s/\<llquantexp\>/toint_quantexp/g
s/\<llrintd128x\>/dec128x_llrint/g
s/\<llrintd128\>/dec128_llrint/g
s/\<llrintd32\>/dec32_llrint/g
s/\<llrintd64x\>/dec64x_llrint/g
s/\<llrintd64\>/dec64_llrint/g
s/\<llrintf128x\>/flt128x_llrint/g
s/\<llrintf128\>/flt128_llrint/g
s/\<llrintf16\>/flt16_llrint/g
s/\<llrintf32x\>/flt32x_llrint/g
s/\<llrintf32\>/flt32_llrint/g
s/\<llrintf64x\>/flt64x_llrint/g
s/\<llrintf64\>/flt64_llrint/g
s/\<llroundd128x\>/dec128x_llround/g
s/\<llroundd128\>/dec128_llround/g
s/\<llroundd32\>/dec32_llround/g
s/\<llroundd64x\>/dec64x_llround/g
s/\<llroundd64\>/dec64_llround/g
s/\<llroundf128x\>/flt128x_llround/g
s/\<llroundf128\>/flt128_llround/g
s/\<llroundf16\>/flt16_llround/g
s/\<llroundf32x\>/flt32x_llround/g
s/\<llroundf32\>/flt32_llround/g
s/\<llroundf64x\>/flt64x_llround/g
s/\<llroundf64\>/flt64_llround/g
s/\<log10d128x\>/dec128x_log10/g
s/\<log10d128\>/dec128_log10/g
s/\<log10d32\>/dec32_log10/g
s/\<log10d64x\>/dec64x_log10/g
s/\<log10d64\>/dec64_log10/g
s/\<log10f128x\>/flt128x_log10/g
s/\<log10f128\>/flt128_log10/g
s/\<log10f32x\>/flt32x_log10/g
s/\<log10f32\>/flt32_log10/g
s/\<log10f64x\>/flt64x_log10/g
s/\<log10f64\>/flt64_log10/g
s/\<log10p1d128x\>/dec128x_log10p1/g
s/\<log10p1d128\>/dec128_log10p1/g
s/\<log10p1d32\>/dec32_log10p1/g
s/\<log10p1d64x\>/dec64x_log10p1/g
s/\<log10p1d64\>/dec64_log10p1/g
s/\<log10p1f128x\>/flt128x_log10p1/g
```

```
s/\<log10p1f128\>/flt128_log10p1/g
s/\<log10p1f32x\>/flt32x_log10p1/g
s/\<log10p1f32\>/flt32_log10p1/g
s/\<log10p1f64x\>/flt64x_log10p1/g
s/\<log10p1f64\>/flt64_log10p1/g
s/\<log10p1f\>/flt_log10p1/g
s/\<log10p1l\>/ldbl_log10p1/g
# no change for log10p1
s/\<log1pd128x\>/dec128x_log1p/g
s/\<log1pd128\>/dec128_log1p/g
s/\<log1pd32\>/dec32_log1p/g
s/\<log1pd64x\>/dec64x_log1p/g
s/\<log1pd64\>/dec64_log1p/g
s/\<log1pf128x\>/flt128x_log1p/g
s/\<log1pf128\>/flt128_log1p/g
s/\<log1pf32x\>/flt32x_log1p/g
s/\<log1pf32\>/flt32_log1p/g
s/\<log1pf64x\>/flt64x_log1p/g
s/\<log1pf64\>/flt64_log1p/g
s/\<log2d128x\>/dec128x_log2/g
s/\<log2d128\>/dec128_log2/g
s/\<log2d32\>/dec32_log2/g
s/\<log2d64x\>/dec64x_log2/g
s/\<log2d64\>/dec64_log2/g
s/\<log2f128x\>/flt128x_log2/g
s/\<log2f128\>/flt128_log2/g
s/\<log2f32x\>/flt32x_log2/g
s/\<log2f32\>/flt32_log2/g
s/\<log2f64x\>/flt64x_log2/g
s/\<log2f64\>/flt64_log2/g
s/\<log2p1d128x\>/dec128x_log2p1/g
s/\<log2p1d128\>/dec128_log2p1/g
s/\<log2p1d32\>/dec32_log2p1/g
s/\<log2p1d64x\>/dec64x_log2p1/g
s/\<log2p1d64\>/dec64_log2p1/g
s/\<log2p1f128x\>/flt128x_log2p1/g
s/\<log2p1f128\>/flt128_log2p1/g
s/\<log2p1f32x\>/flt32x_log2p1/g
s/\<log2p1f32\>/flt32_log2p1/g
s/\<log2p1f64x\>/flt64x_log2p1/g
s/\<log2p1f64\>/flt64_log2p1/g
s/\<log2p1f\>/flt_log2p1/g
s/\<log2p1l\>/ldbl_log2p1/g
# no change for log2p1
s/\<logbd128x\>/dec128x_logb/g
s/\<logbd128\>/dec128_logb/g
s/\<logbd32\>/dec32_logb/g
s/\<logbd64x\>/dec64x_logb/g
s/\<logbd64\>/dec64_logb/g
s/\<logbf128x\>/flt128x_logb/g
s/\<logbf128\>/flt128_logb/g
s/\<logbf16\>/flt16_logb/g
s/\<logbf32x\>/flt32x_logb/g
s/\<logbf32\>/flt32_logb/g
s/\<logbf64x\>/flt64x_logb/g
s/\<logbf64\>/flt64_logb/g
s/\<logd128x\>/dec128x_log/g
s/\<logd128\>/dec128_log/g
s/\<logd32\>/dec32_log/g
s/\<logd64x\>/dec64x_log/g
s/\<logd64\>/dec64_log/g
s/\<logf128x\>/flt128x_log/g
s/\<logf128\>/flt128_log/g
```

```
s/\<logf16\>/flt16_log/g
s/\<logf32x\>/flt32x_log/g
s/\<logf32\>/flt32_log/g
s/\<logf64x\>/flt64x_log/g
s/\<logf64\>/flt64_log/g
s/\<logp1d128x\>/dec128x_logp1/g
s/\<logp1d128\>/dec128_logp1/g
s/\<logp1d32\>/dec32_logp1/g
s/\<logp1d64x\>/dec64x_logp1/g
s/\<logp1d64\>/dec64_logp1/g
s/\<logp1f128x\>/flt128x_logp1/g
s/\<logp1f128\>/flt128_logp1/g
s/\<logp1f32x\>/flt32x_logp1/g
s/\<logp1f32\>/flt32_logp1/g
s/\<logp1f64x\>/flt64x_logp1/g
s/\<logp1f64\>/flt64_logp1/g
s/\<logp1f\>/flt_logp1/g
s/\<logp1l\>/ldbl_logp1/g
# no change for logp1
# no change for long_double_t
s/\<lrintd128x\>/dec128x_lrint/g
s/\<lrintd128\>/dec128_lrint/g
s/\<lrintd32\>/dec32_lrint/g
s/\<lrintd64x\>/dec64x_lrint/g
s/\<lrintd64\>/dec64_lrint/g
s/\<lrintf128x\>/flt128x_lrint/g
s/\<lrintf128\>/flt128_lrint/g
s/\<lrintf16\>/flt16_lrint/g
s/\<lrintf32x\>/flt32x_lrint/g
s/\<lrintf32\>/flt32_lrint/g
s/\<lrintf64x\>/flt64x_lrint/g
s/\<lrintf64\>/flt64_lrint/g
s/\<lroundd128x\>/dec128x_lround/g
s/\<lroundd128\>/dec128_lround/g
s/\<lroundd32\>/dec32_lround/g
s/\<lroundd64x\>/dec64x_lround/g
s/\<lroundd64\>/dec64_lround/g
s/\<lroundf128x\>/flt128x_lround/g
s/\<lroundf128\>/flt128_lround/g
s/\<lroundf16\>/flt16_lround/g
s/\<lroundf32x\>/flt32x_lround/g
s/\<lroundf32\>/flt32_lround/g
s/\<lroundf64x\>/flt64x_lround/g
s/\<lroundf64\>/flt64_lround/g
# no change for maybe_unused
s/\<modfd128x\>/dec128x_modf/g
s/\<modfd128\>/dec128_modf/g
s/\<modfd32\>/dec32_modf/g
s/\<modfd64x\>/dec64x_modf/g
s/\<modfd64\>/dec64_modf/g
s/\<modff128x\>/flt128x_modf/g
s/\<modff128\>/flt128_modf/g
s/\<modff16\>/flt16_modf/g
s/\<modff32x\>/flt32x_modf/g
s/\<modff32\>/flt32_modf/g
s/\<modff64x\>/flt64x_modf/g
s/\<modff64\>/flt64_modf/g
s/\<nand128x\>/dec128x_nan/g
s/\<nand128\>/dec128_nan/g
s/\<nand32\>/dec32_nan/g
s/\<nand64x\>/dec64x_nan/g
s/\<nand64\>/dec64_nan/g
s/\<nanf128x\>/flt128x_nan/g
```

```
s/\<nanf128\>/flt128_nan/g
s/\<nanf16\>/flt16_nan/g
s/\<nanf32x\>/flt32x_nan/g
s/\<nanf32\>/flt32_nan/g
s/\<nanf64x\>/flt64x_nan/g
s/\<nanf64\>/flt64_nan/g
s/\<nearbyintd128x\>/dec128x_nearbyint/g
s/\<nearbyintd128\>/dec128_nearbyint/g
s/\<nearbyintd32\>/dec32_nearbyint/g
s/\<nearbyintd64x\>/dec64x_nearbyint/g
s/\<nearbyintd64\>/dec64_nearbyint/g
s/\<nearbyintf128x\>/flt128x_nearbyint/g
s/\<nearbyintf128\>/flt128_nearbyint/g
s/\<nearbyintf16\>/flt16_nearbyint/g
s/\<nearbyintf32x\>/flt32x_nearbyint/g
s/\<nearbyintf32\>/flt32_nearbyint/g
s/\<nearbyintf64x\>/flt64x_nearbyint/g
s/\<nearbyintf64\>/flt64_nearbyint/g
s/\<nextafterd128x\>/dec128x_nextafter/g
s/\<nextafterd128\>/dec128_nextafter/g
s/\<nextafterd32\>/dec32_nextafter/g
s/\<nextafterd64x\>/dec64x_nextafter/g
s/\<nextafterd64\>/dec64_nextafter/g
s/\<nextafterf128x\>/flt128x_nextafter/g
s/\<nextafterf128\>/flt128_nextafter/g
s/\<nextafterf16\>/flt16_nextafter/g
s/\<nextafterf32x\>/flt32x_nextafter/g
s/\<nextafterf32\>/flt32_nextafter/g
s/\<nextafterf64x\>/flt64x_nextafter/g
s/\<nextafterf64\>/flt64_nextafter/g
s/\<nextdownd128x\>/dec128x_nextdown/g
s/\<nextdownd128\>/dec128_nextdown/g
s/\<nextdownd32\>/dec32_nextdown/g
s/\<nextdownd64x\>/dec64x_nextdown/g
s/\<nextdownd64\>/dec64_nextdown/g
s/\<nextdownf128x\>/flt128x_nextdown/g
s/\<nextdownf128\>/flt128_nextdown/g
s/\<nextdownf16\>/flt16_nextdown/g
s/\<nextdownf32x\>/flt32x_nextdown/g
s/\<nextdownf32\>/flt32_nextdown/g
s/\<nextdownf64x\>/flt64x_nextdown/g
s/\<nextdownf64\>/flt64_nextdown/g
s/\<nextdownf\>/flt_nextdown/g
s/\<nextdownl\>/ldbl_nextdown/g
# no change for nextdown
s/\<nexttowardd128x\>/dec128x_nexttoward/g
s/\<nexttowardd128\>/dec128_nexttoward/g
s/\<nexttowardd32\>/dec32_nexttoward/g
s/\<nexttowardd64x\>/dec64x_nexttoward/g
s/\<nexttowardd64\>/dec64_nexttoward/g
s/\<nexttowardf128x\>/flt128x_nexttoward/g
s/\<nexttowardf128\>/flt128_nexttoward/g
s/\<nexttowardf16\>/flt16_nexttoward/g
s/\<nexttowardf32x\>/flt32x_nexttoward/g
s/\<nexttowardf32\>/flt32_nexttoward/g
s/\<nexttowardf64x\>/flt64x_nexttoward/g
s/\<nexttowardf64\>/flt64_nexttoward/g
s/\<nextupd128x\>/dec128x_nextup/g
s/\<nextupd128\>/dec128_nextup/g
s/\<nextupd32\>/dec32_nextup/g
s/\<nextupd64x\>/dec64x_nextup/g
s/\<nextupd64\>/dec64_nextup/g
s/\<nextupf128x\>/flt128x_nextup/g
```

```
s/\<nextupf128\>/flt128_nextup/g
s/\<nextupf16\>/flt16_nextup/g
s/\<nextupf32x\>/flt32x_nextup/g
s/\<nextupf32\>/flt32_nextup/g
s/\<nextupf64x\>/flt64x_nextup/g
s/\<nextupf64\>/flt64_nextup/g
s/\<nextupf\>/flt_nextup/g
s/\<nextupl\>/ldbl_nextup/g
# no change for nextup
# no change for nodiscard
s/\<powd128x\>/dec128x_pow/g
s/\<powd128\>/dec128_pow/g
s/\<powd32\>/dec32_pow/g
s/\<powd64x\>/dec64x_pow/g
s/\<powd64\>/dec64_pow/g
s/\<powf128x\>/flt128x_pow/g
s/\<powf128\>/flt128_pow/g
s/\<powf16\>/flt16_pow/g
s/\<powf32x\>/flt32x_pow/g
s/\<powf32\>/flt32_pow/g
s/\<powf64x\>/flt64x_pow/g
s/\<powf64\>/flt64_pow/g
s/\<pownd128x\>/dec128x_pown/g
s/\<pownd128\>/dec128_pown/g
s/\<pownd32\>/dec32_pown/g
s/\<pownd64x\>/dec64x_pown/g
s/\<pownd64\>/dec64_pown/g
s/\<pownf128x\>/flt128x_pown/g
s/\<pownf128\>/flt128_pown/g
s/\<pownf16\>/flt16_pown/g
s/\<pownf32x\>/flt32x_pown/g
s/\<pownf32\>/flt32_pown/g
s/\<pownf64x\>/flt64x_pown/g
s/\<pownf64\>/flt64_pown/g
s/\<pownf\>/flt_pown/g
s/\<pownl\>/ldbl_pown/g
# no change for pown
s/\<powrd128x\>/dec128x_powr/g
s/\<powrd128\>/dec128_powr/g
s/\<powrd32\>/dec32_powr/g
s/\<powrd64x\>/dec64x_powr/g
s/\<powrd64\>/dec64_powr/g
s/\<powrf128x\>/flt128x_powr/g
s/\<powrf128\>/flt128_powr/g
s/\<powrf16\>/flt16_powr/g
s/\<powrf32x\>/flt32x_powr/g
s/\<powrf32\>/flt32_powr/g
s/\<powrf64x\>/flt64x_powr/g
s/\<powrf64\>/flt64_powr/g
s/\<powrf\>/flt_powr/g
s/\<powrl\>/ldbl_powr/g
# no change for powr
s/\<quantized128x\>/dec128x_quantize/g
s/\<quantized128\>/dec128_quantize/g
s/\<quantized32\>/dec32_quantize/g
s/\<quantized64x\>/dec64x_quantize/g
s/\<quantized64\>/dec64_quantize/g
s/\<quantizef128x\>/flt128x_quantize/g
s/\<quantizef128\>/flt128_quantize/g
s/\<quantizef16\>/flt16_quantize/g
s/\<quantizef32x\>/flt32x_quantize/g
s/\<quantizef32\>/flt32_quantize/g
s/\<quantizef64x\>/flt64x_quantize/g
```

```
s/\<quantizef64\>/flt64_quantize/g
# no change for quantize
s/\<quantumd128x\>/dec128x_quantum/g
s/\<quantumd128\>/dec128_quantum/g
s/\<quantumd32\>/dec32_quantum/g
s/\<quantumd64x\>/dec64x_quantum/g
s/\<quantumd64\>/dec64_quantum/g
s/\<quantumf128x\>/flt128x_quantum/g
s/\<quantumf128\>/flt128_quantum/g
s/\<quantumf16\>/flt16_quantum/g
s/\<quantumf32x\>/flt32x_quantum/g
s/\<quantumf32\>/flt32_quantum/g
s/\<quantumf64x\>/flt64x_quantum/g
s/\<quantumf64\>/flt64_quantum/g
# no change for quantum
s/\<remainderd128x\>/dec128x_remainder/g
s/\<remainderd128\>/dec128_remainder/g
s/\<remainderd32\>/dec32_remainder/g
s/\<remainderd64x\>/dec64x_remainder/g
s/\<remainderd64\>/dec64_remainder/g
s/\<remainderf128x\>/flt128x_remainder/g
s/\<remainderf128\>/flt128_remainder/g
s/\<remainderf16\>/flt16_remainder/g
s/\<remainderf32x\>/flt32x_remainder/g
s/\<remainderf32\>/flt32_remainder/g
s/\<remainderf64x\>/flt64x_remainder/g
s/\<remainderf64\>/flt64_remainder/g
s/\<rintd128x\>/dec128x_rint/g
s/\<rintd128\>/dec128_rint/g
s/\<rintd32\>/dec32_rint/g
s/\<rintd64x\>/dec64x_rint/g
s/\<rintd64\>/dec64_rint/g
s/\<rintf128x\>/flt128x_rint/g
s/\<rintf128\>/flt128_rint/g
s/\<rintf16\>/flt16_rint/g
s/\<rintf32x\>/flt32x_rint/g
s/\<rintf32\>/flt32_rint/g
s/\<rintf64x\>/flt64x_rint/g
s/\<rintf64\>/flt64_rint/g
s/\<rootnd128x\>/dec128x_rootn/g
s/\<rootnd128\>/dec128_rootn/g
s/\<rootnd32\>/dec32_rootn/g
s/\<rootnd64x\>/dec64x_rootn/g
s/\<rootnd64\>/dec64_rootn/g
s/\<rootnf128x\>/flt128x_rootn/g
s/\<rootnf128\>/flt128_rootn/g
s/\<rootnf16\>/flt16_rootn/g
s/\<rootnf32x\>/flt32x_rootn/g
s/\<rootnf32\>/flt32_rootn/g
s/\<rootnf64x\>/flt64x_rootn/g
s/\<rootnf64\>/flt64_rootn/g
s/\<rootnf\>/flt_rootn/g
s/\<rootnl\>/ldbl_rootn/g
# no change for rootn
s/\<roundd128x\>/dec128x_round/g
s/\<roundd128\>/dec128_round/g
s/\<roundd32\>/dec32_round/g
s/\<roundd64x\>/dec64x_round/g
s/\<roundd64\>/dec64_round/g
s/\<roundevend128x\>/dec128x_roundeven/g
s/\<roundevend128\>/dec128_roundeven/g
s/\<roundevend32\>/dec32_roundeven/g
s/\<roundevend64x\>/dec64x_roundeven/g
```

```
s/\<roundevend64\>/dec64_roundeven/g
s/\<roundevenf128x\>/flt128x_roundeven/g
s/\<roundevenf128\>/flt128_roundeven/g
s/\<roundevenf16\>/flt16_roundeven/g
s/\<roundevenf32x\>/flt32x_roundeven/g
s/\<roundevenf32\>/flt32_roundeven/g
s/\<roundevenf64x\>/flt64x_roundeven/g
s/\<roundevenf64\>/flt64_roundeven/g
s/\<roundevenf\>/flt_roundeven/g
s/\<roundevenl\>/ldbl_roundeven/g
# no change for roundeven
s/\<roundf128x\>/flt128x_round/g
s/\<roundf128\>/flt128_round/g
s/\<roundf16\>/flt16_round/g
s/\<roundf32x\>/flt32x_round/g
s/\<roundf32\>/flt32_round/g
s/\<roundf64x\>/flt64x_round/g
s/\<roundf64\>/flt64_round/g
s/\<rsqrtd128x\>/dec128x_rsqrt/g
s/\<rsqrtd128\>/dec128_rsqrt/g
s/\<rsqrtd32\>/dec32_rsqrt/g
s/\<rsqrtd64x\>/dec64x_rsqrt/g
s/\<rsqrtd64\>/dec64_rsqrt/g
s/\<rsqrtf128x\>/flt128x_rsqrt/g
s/\<rsqrtf128\>/flt128_rsqrt/g
s/\<rsqrtf16\>/flt16_rsqrt/g
s/\<rsqrtf32x\>/flt32x_rsqrt/g
s/\<rsqrtf32\>/flt32_rsqrt/g
s/\<rsqrtf64x\>/flt64x_rsqrt/g
s/\<rsqrtf64\>/flt64_rsqrt/g
s/\<rsqrtf\>/flt_rsqrt/g
s/\<rsqrtl\>/ldbl_rsqrt/g
# no change for rsqrt
s/\<samequantumd128x\>/dec128x_samequantum/g
s/\<samequantumd128\>/dec128_samequantum/g
s/\<samequantumd32\>/dec32_samequantum/g
s/\<samequantumd64x\>/dec64x_samequantum/g
s/\<samequantumd64\>/dec64_samequantum/g
s/\<samequantumf128x\>/flt128x_samequantum/g
s/\<samequantumf128\>/flt128_samequantum/g
s/\<samequantumf16\>/flt16_samequantum/g
s/\<samequantumf32x\>/flt32x_samequantum/g
s/\<samequantumf32\>/flt32_samequantum/g
s/\<samequantumf64x\>/flt64x_samequantum/g
s/\<samequantumf64\>/flt64_samequantum/g
# no change for samequantum
s/\<scalblnd128x\>/dec128x_scalbln/g
s/\<scalblnd128\>/dec128_scalbln/g
s/\<scalblnd32\>/dec32_scalbln/g
s/\<scalblnd64x\>/dec64x_scalbln/g
s/\<scalblnd64\>/dec64_scalbln/g
s/\<scalblnf128x\>/flt128x_scalbln/g
s/\<scalblnf128\>/flt128_scalbln/g
s/\<scalblnf16\>/flt16_scalbln/g
s/\<scalblnf32x\>/flt32x_scalbln/g
s/\<scalblnf32\>/flt32_scalbln/g
s/\<scalblnf64x\>/flt64x_scalbln/g
s/\<scalblnf64\>/flt64_scalbln/g
s/\<scalbnd128x\>/dec128x_scalbn/g
s/\<scalbnd128\>/dec128_scalbn/g
s/\<scalbnd32\>/dec32_scalbn/g
s/\<scalbnd64x\>/dec64x_scalbn/g
s/\<scalbnd64\>/dec64_scalbn/g
```

```
s/\<scalbnf128x\>/flt128x_scalbn/g
s/\<scalbnf128\>/flt128_scalbn/g
s/\<scalbnf16\>/flt16_scalbn/g
s/\<scalbnf32x\>/flt32x_scalbn/g
s/\<scalbnf32\>/flt32_scalbn/g
s/\<scalbnf64x\>/flt64x_scalbn/g
s/\<scalbnf64\>/flt64_scalbn/g
s/\<setpayloadd128x\>/dec128x_setpayload/g
s/\<setpayloadd128\>/dec128_setpayload/g
s/\<setpayloadd32\>/dec32_setpayload/g
s/\<setpayloadd64x\>/dec64x_setpayload/g
s/\<setpayloadd64\>/dec64_setpayload/g
s/\<setpayloadf128x\>/flt128x_setpayload/g
s/\<setpayloadf128\>/flt128_setpayload/g
s/\<setpayloadf16\>/flt16_setpayload/g
s/\<setpayloadf32x\>/flt32x_setpayload/g
s/\<setpayloadf32\>/flt32_setpayload/g
s/\<setpayloadf64x\>/flt64x_setpayload/g
s/\<setpayloadf64\>/flt64_setpayload/g
s/\<setpayloadf\>/flt_setpayload/g
s/\<setpayloadl\>/ldbl_setpayload/g
s/\<setpayloadsigd128x\>/dec128x_setpayloadsig/g
s/\<setpayloadsigd128\>/dec128_setpayloadsig/g
s/\<setpayloadsigd32\>/dec32_setpayloadsig/g
s/\<setpayloadsigd64x\>/dec64x_setpayloadsig/g
s/\<setpayloadsigd64\>/dec64_setpayloadsig/g
s/\<setpayloadsigf128x\>/flt128x_setpayloadsig/g
s/\<setpayloadsigf128\>/flt128_setpayloadsig/g
s/\<setpayloadsigf16\>/flt16_setpayloadsig/g
s/\<setpayloadsigf32x\>/flt32x_setpayloadsig/g
s/\<setpayloadsigf32\>/flt32_setpayloadsig/g
s/\<setpayloadsigf64x\>/flt64x_setpayloadsig/g
s/\<setpayloadsigf64\>/flt64_setpayloadsig/g
s/\<setpayloadsigf\>/flt_setpayloadsig/g
s/\<setpayloadsigl\>/ldbl_setpayloadsig/g
# no change for setpayloadsig
# no change for setpayload
s/\<sind128x\>/dec128x_sin/g
s/\<sind128\>/dec128_sin/g
s/\<sind32\>/dec32_sin/g
s/\<sind64x\>/dec64x_sin/g
s/\<sind64\>/dec64_sin/g
s/\<sinf128x\>/flt128x_sin/g
s/\<sinf128\>/flt128_sin/g
s/\<sinf16\>/flt16_sin/g
s/\<sinf32x\>/flt32x_sin/g
s/\<sinf32\>/flt32_sin/g
s/\<sinf64x\>/flt64x_sin/g
s/\<sinf64\>/flt64_sin/g
s/\<sinhd128x\>/dec128x_sinh/g
s/\<sinhd128\>/dec128_sinh/g
s/\<sinhd32\>/dec32_sinh/g
s/\<sinhd64x\>/dec64x_sinh/g
s/\<sinhd64\>/dec64_sinh/g
s/\<sinhf128x\>/flt128x_sinh/g
s/\<sinhf128\>/flt128_sinh/g
s/\<sinhf16\>/flt16_sinh/g
s/\<sinhf32x\>/flt32x_sinh/g
s/\<sinhf32\>/flt32_sinh/g
s/\<sinhf64x\>/flt64x_sinh/g
s/\<sinhf64\>/flt64_sinh/g
s/\<sinpid128x\>/dec128x_sinpi/g
s/\<sinpid128\>/dec128_sinpi/g
```

```
s/\<sinpid32\>/dec32_sinpi/g
s/\<sinpid64x\>/dec64x_sinpi/g
s/\<sinpid64\>/dec64_sinpi/g
s/\<sinpif128x\>/flt128x_sinpi/g
s/\<sinpif128\>/flt128_sinpi/g
s/\<sinpif16\>/flt16_sinpi/g
s/\<sinpif32x\>/flt32x_sinpi/g
s/\<sinpif32\>/flt32_sinpi/g
s/\<sinpif64x\>/flt64x_sinpi/g
s/\<sinpif64\>/flt64_sinpi/g
s/\<sinpif\>/flt_sinpi/g
s/\<sinpil\>/ldbl_sinpi/g
# no change for sinpi
s/\<sqrtd128x\>/dec128x_sqrt/g
s/\<sqrtd128\>/dec128_sqrt/g
s/\<sqrtd32\>/dec32_sqrt/g
s/\<sqrtd64x\>/dec64x_sqrt/g
s/\<sqrtd64\>/dec64_sqrt/g
s/\<sqrtf128x\>/flt128x_sqrt/g
s/\<sqrtf128\>/flt128_sqrt/g
s/\<sqrtf16\>/flt16_sqrt/g
s/\<sqrtf32x\>/flt32x_sqrt/g
s/\<sqrtf32\>/flt32_sqrt/g
s/\<sqrtf64x\>/flt64x_sqrt/g
s/\<sqrtf64\>/flt64_sqrt/g
s/\<tand128x\>/dec128x_tan/g
s/\<tand128\>/dec128_tan/g
s/\<tand32\>/dec32_tan/g
s/\<tand64x\>/dec64x_tan/g
s/\<tand64\>/dec64_tan/g
s/\<tanf128x\>/flt128x_tan/g
s/\<tanf128\>/flt128_tan/g
s/\<tanf16\>/flt16_tan/g
s/\<tanf32x\>/flt32x_tan/g
s/\<tanf32\>/flt32_tan/g
s/\<tanf64x\>/flt64x_tan/g
s/\<tanf64\>/flt64_tan/g
s/\<tanhd128x\>/dec128x_tanh/g
s/\<tanhd128\>/dec128_tanh/g
s/\<tanhd32\>/dec32_tanh/g
s/\<tanhd64x\>/dec64x_tanh/g
s/\<tanhd64\>/dec64_tanh/g
s/\<tanhf128x\>/flt128x_tanh/g
s/\<tanhf128\>/flt128_tanh/g
s/\<tanhf16\>/flt16_tanh/g
s/\<tanhf32x\>/flt32x_tanh/g
s/\<tanhf32\>/flt32_tanh/g
s/\<tanhf64x\>/flt64x_tanh/g
s/\<tanhf64\>/flt64_tanh/g
s/\<tanpid128x\>/dec128x_tanpi/g
s/\<tanpid128\>/dec128_tanpi/g
s/\<tanpid32\>/dec32_tanpi/g
s/\<tanpid64x\>/dec64x_tanpi/g
s/\<tanpid64\>/dec64_tanpi/g
s/\<tanpif128x\>/flt128x_tanpi/g
s/\<tanpif128\>/flt128_tanpi/g
s/\<tanpif16\>/flt16_tanpi/g
s/\<tanpif32x\>/flt32x_tanpi/g
s/\<tanpif32\>/flt32_tanpi/g
s/\<tanpif64x\>/flt64x_tanpi/g
s/\<tanpif64\>/flt64_tanpi/g
s/\<tanpif\>/flt_tanpi/g
s/\<tanpil\>/ldbl_tanpi/g
```

```
# no change for tanpi
s/\<tgammad128x\>/dec128x_tgamma/g
s/\<tgammad128\>/dec128_tgamma/g
s/\<tgammad32\>/dec32_tgamma/g
s/\<tgammad64x\>/dec64x_tgamma/g
s/\<tgammad64\>/dec64_tgamma/g
s/\<tgammaf128x\>/flt128x_tgamma/g
s/\<tgammaf128\>/flt128_tgamma/g
s/\<tgammaf16\>/flt16_tgamma/g
s/\<tgammaf32x\>/flt32x_tgamma/g
s/\<tgammaf32\>/flt32_tgamma/g
s/\<tgammaf64x\>/flt64x_tgamma/g
s/\<tgammaf64\>/flt64_tgamma/g
s/\<truncd128x\>/dec128x_trunc/g
s/\<truncd128\>/dec128_trunc/g
s/\<truncd32\>/dec32_trunc/g
s/\<truncd64x\>/dec64x_trunc/g
s/\<truncd64\>/dec64_trunc/g
s/\<truncf128x\>/flt128x_trunc/g
s/\<truncf128\>/flt128_trunc/g
s/\<truncf16\>/flt16_trunc/g
s/\<truncf32x\>/flt32x_trunc/g
s/\<truncf32\>/flt32_trunc/g
s/\<truncf64x\>/flt64x_trunc/g
s/\<truncf64\>/flt64_trunc/g
s/\<ufromfpd128x\>/dec128x_touint/g
s/\<ufromfpd128\>/dec128_touint/g
s/\<ufromfpd32\>/dec32_touint/g
s/\<ufromfpd64x\>/dec64x_touint/g
s/\<ufromfpd64\>/dec64_touint/g
s/\<ufromfpf128x\>/flt128x_touint/g
s/\<ufromfpf128\>/flt128_touint/g
s/\<ufromfpf16\>/flt16_touint/g
s/\<ufromfpf32x\>/flt32x_touint/g
s/\<ufromfpf32\>/flt32_touint/g
s/\<ufromfpf64x\>/flt64x_touint/g
s/\<ufromfpf64\>/flt64_touint/g
s/\<ufromfpf\>/flt_touint/g
s/\<ufromfpl\>/ldbl_touint/g
s/\<ufromfpxd128x\>/dec128x_touintx/g
s/\<ufromfpxd128\>/dec128_touintx/g
s/\<ufromfpxd32\>/dec32_touintx/g
s/\<ufromfpxd64x\>/dec64x_touintx/g
s/\<ufromfpxd64\>/dec64_touintx/g
s/\<ufromfpxf128x\>/flt128x_touintx/g
s/\<ufromfpxf128\>/flt128_touintx/g
s/\<ufromfpxf16\>/flt16_touintx/g
s/\<ufromfpxf32x\>/flt32x_touintx/g
s/\<ufromfpxf32\>/flt32_touintx/g
s/\<ufromfpxf64x\>/flt64x_touintx/g
s/\<ufromfpxf64\>/flt64_touintx/g
s/\<ufromfpxf\>/flt_touintx/g
s/\<ufromfpxl\>/ldbl_touintx/g
s/\<ufromfpx\>/touintx/g
s/\<ufromfp\>/touint/g
s/\<_Decimal\([0-9]\{1,\}\)_t\>/dec\1_eval_t/g
s/\<_Float\([0-9]\{1,\}\)_t\>/flt\1_eval_t/g
s/\<_Decimal\([0-9]\{1,\}[x]\{,1\}\)\>/dec\1_t/g
s/\<_Float\([0-9]\{1,\}[x]\{,1\}\)\>/flt\1_t/g
```

6.2. An preprocessor header file for replacement

```
#define CR_DECIMAL_DIG FP_DECIMAL_DIG
#define FENV_DEC_ROUND FE_DEC_ROUND
#define FENV_ROUND FE_ROUND
#define HUGE_VAL_D128X D128X_HUGE_VAL
#define HUGE_VAL_D128 D128_HUGE_VAL
#define HUGE_VAL_D32 D32_HUGE_VAL
#define HUGE_VAL_D64X D64X_HUGE_VAL
#define HUGE_VAL_D64 D64_HUGE_VAL
#define HUGE_VAL_F128X F128X_HUGE_VAL
#define HUGE_VAL_F128 F128_HUGE_VAL
#define HUGE_VAL_F16 F16_HUGE_VAL
#define HUGE_VAL_F32X F32X_HUGE_VAL
#define HUGE_VAL_F32 F32_HUGE_VAL
#define HUGE_VAL_F64X F64X_HUGE_VAL
#define HUGE_VAL_F64 F64_HUGE_VAL
#define SNAND128X DEC128X_SNAN
#define SNAND128 DEC128_SNAN
#define SNAND32 DEC32_SNAN
#define SNAND64X DEC64X_SNAN
#define SNAND64 DEC64_SNAN
#define SNANF128X FLT128X_SNAN
#define SNANF128 FLT128_SNAN
#define SNANF16 FLT16_SNAN
#define SNANF32X FLT32X_SNAN
#define SNANF32 FLT32_SNAN
#define SNANF64X FLT64X_SNAN
#define SNANF64 FLT64_SNAN
#define SNANF FLT_SNAN
#define SNANL LDBL_SNAN
#define SNAN DBL_SNAN
#define acosd128x dec128x_acos
#define acosd128 dec128_acos
#define acosd32 dec32_acos
#define acosd64x dec64x_acos
#define acosd64 dec64_acos
#define acosf128x flt128x_acos
#define acosf128 flt128_acos
#define acosf16 flt16_acos
#define acosf32x flt32x_acos
#define acosf32 flt32_acos
#define acosf64x flt64x_acos
#define acosf64 flt64_acos
#define acoshd128x dec128x_acosh
#define acoshd128 dec128_acosh
#define acoshd32 dec32_acosh
#define acoshd64x dec64x_acosh
#define acoshd64 dec64_acosh
#define acoshf128x flt128x_acosh
#define acoshf128 flt128_acosh
#define acoshf16 flt16_acosh
#define acoshf32x flt32x_acosh
#define acoshf32 flt32_acosh
#define acoshf64x flt64x_acosh
#define acoshf64 flt64_acosh
#define acospid128x dec128x_acospi
#define acospid128 dec128_acospi
#define acospid32 dec32_acospi
#define acospid64x dec64x_acospi
#define acospid64 dec64_acospi
#define acospif128x flt128x_acospi
#define acospif128 flt128_acospi
```

```
#define acospif16 flt16_acospi
#define acospif32x flt32x_acospi
#define acospif32 flt32_acospi
#define acospif64x flt64x_acospi
#define acospif64 flt64_acospi
#define acospif flt_acospi
#define acospil ldbl_acospi
#define asind128x dec128x_asin
#define asind128 dec128_asin
#define asind32 dec32_asin
#define asind64x dec64x_asin
#define asind64 dec64_asin
#define asinf128x flt128x_asin
#define asinf128 flt128_asin
#define asinf16 flt16_asin
#define asinf32x flt32x_asin
#define asinf32 flt32_asin
#define asinf64x flt64x_asin
#define asinf64 flt64_asin
#define asinhd128x dec128x_asinh
#define asinhd128 dec128_asinh
#define asinhd32 dec32_asinh
#define asinhd64x dec64x_asinh
#define asinhd64 dec64_asinh
#define asinhf128x flt128x_asinh
#define asinhf128 flt128_asinh
#define asinhf16 flt16_asinh
#define asinhf32x flt32x_asinh
#define asinhf32 flt32_asinh
#define asinhf64x flt64x_asinh
#define asinhf64 flt64_asinh
#define asinpid128x dec128x_asinpi
#define asinpid128 dec128_asinpi
#define asinpid32 dec32_asinpi
#define asinpid64x dec64x_asinpi
#define asinpid64 dec64_asinpi
#define asinpif128x flt128x_asinpi
#define asinpif128 flt128_asinpi
#define asinpif16 flt16_asinpi
#define asinpif32x flt32x_asinpi
#define asinpif32 flt32_asinpi
#define asinpif64x flt64x_asinpi
#define asinpif64 flt64_asinpi
#define asinpif flt_asinpi
#define asinpil ldbl_asinpi
#define atan2d128x dec128x_atan2
#define atan2d128 dec128_atan2
#define atan2d32 dec32_atan2
#define atan2d64x dec64x_atan2
#define atan2d64 dec64_atan2
#define atan2f128x flt128x_atan2
#define atan2f128 flt128_atan2
#define atan2f32x flt32x_atan2
#define atan2f32 flt32_atan2
#define atan2f64x flt64x_atan2
#define atan2f64 flt64_atan2
#define atan2pid128x dec128x_atan2pi
#define atan2pid128 dec128_atan2pi
#define atan2pid32 dec32_atan2pi
#define atan2pid64x dec64x_atan2pi
#define atan2pid64 dec64_atan2pi
#define atan2pif128x flt128x_atan2pi
#define atan2pif128 flt128_atan2pi
```

```
#define atan2pif32x flt32x_atan2pi
#define atan2pif32 flt32_atan2pi
#define atan2pif64x flt64x_atan2pi
#define atan2pif64 flt64_atan2pi
#define atan2pif flt_atan2pi
#define atan2pil ldbl_atan2pi
#define atand128x dec128x_atan
#define atand128 dec128_atan
#define atand32 dec32_atan
#define atand64x dec64x_atan
#define atand64 dec64_atan
#define atanf128x flt128x_atan
#define atanf128 flt128_atan
#define atanf16 flt16_atan
#define atanf32x flt32x_atan
#define atanf32 flt32_atan
#define atanf64x flt64x_atan
#define atanf64 flt64_atan
#define atanhd128x dec128x_atanh
#define atanhd128 dec128_atanh
#define atanhd32 dec32_atanh
#define atanhd64x dec64x_atanh
#define atanhd64 dec64_atanh
#define atanhf128x flt128x_atanh
#define atanhf128 flt128_atanh
#define atanhf16 flt16_atanh
#define atanhf32x flt32x_atanh
#define atanhf32 flt32_atanh
#define atanhf64x flt64x_atanh
#define atanhf64 flt64_atanh
#define atanpid128x dec128x_atanpi
#define atanpid128 dec128_atanpi
#define atanpid32 dec32_atanpi
#define atanpid64x dec64x_atanpi
#define atanpid64 dec64_atanpi
#define atanpif128x flt128x_atanpi
#define atanpif128 flt128_atanpi
#define atanpif16 flt16_atanpi
#define atanpif32x flt32x_atanpi
#define atanpif32 flt32_atanpi
#define atanpif64x flt64x_atanpi
#define atanpif64 flt64_atanpi
#define atanpif flt_atanpi
#define atanpil ldbl_atanpi
#define cabsf128x flt128x_cabs
#define cabsf128 flt128_cabs
#define cabsf32x flt32x_cabs
#define cabsf32 flt32_cabs
#define cabsf64x flt64x_cabs
#define cabsf64 flt64_cabs
#define cacosf128x flt128x_cacos
#define cacosf128 flt128_cacos
#define cacosf32x flt32x_cacos
#define cacosf32 flt32_cacos
#define cacosf64x flt64x_cacos
#define cacosf64 flt64_cacos
#define cacoshf128x flt128x_cacosh
#define cacoshf128 flt128_cacosh
#define cacoshf32x flt32x_cacosh
#define cacoshf32 flt32_cacosh
#define cacoshf64x flt64x_cacosh
#define cacoshf64 flt64_cacosh
#define canonicalized128x dec128x_canonicalize
```

```
188 #define canonicalized128 dec128_canonicalize
189 #define canonicalized32 dec32_canonicalize
190 #define canonicalized64x dec64x_canonicalize
191 #define canonicalized64 dec64_canonicalize
192 #define canonicalizef128x flt128x_canonicalize
193 #define canonicalizef128 flt128_canonicalize
194 #define canonicalizef16 flt16_canonicalize
195 #define canonicalizef32x flt32x_canonicalize
196 #define canonicalizef32 flt32_canonicalize
197 #define canonicalizef64x flt64x_canonicalize
198 #define canonicalizef64 flt64_canonicalize
199 #define canonicalizef flt_canonicalize
200 #define canonicalizel ldbl_canonicalize
201 #define cargf128x flt128x_carg
202 #define cargf128 flt128_carg
203 #define cargf32x flt32x_carg
204 #define cargf32 flt32_carg
205 #define cargf64x flt64x_carg
206 #define cargf64 flt64_carg
207 #define casinf128x flt128x_casin
208 #define casinf128 flt128_casin
209 #define casinf32x flt32x_casin
210 #define casinf32 flt32_casin
211 #define casinf64x flt64x_casin
212 #define casinf64 flt64_casin
213 #define casinhf128x flt128x_casinh
214 #define casinhf128 flt128_casinh
215 #define casinhf32x flt32x_casinh
216 #define casinhf32 flt32_casinh
217 #define casinhf64x flt64x_casinh
218 #define casinhf64 flt64_casinh
219 #define catanf128x flt128x_catan
220 #define catanf128 flt128_catan
221 #define catanf32x flt32x_catan
222 #define catanf32 flt32_catan
223 #define catanf64x flt64x_catan
224 #define catanf64 flt64_catan
225 #define catanhf128x flt128x_catanh
226 #define catanhf128 flt128_catanh
227 #define catanhf32x flt32x_catanh
228 #define catanhf32 flt32_catanh
229 #define catanhf64x flt64x_catanh
230 #define catanhf64 flt64_catanh
231 #define cbrtd128x dec128x_cbrt
232 #define cbrtd128 dec128_cbrt
233 #define cbrtd32 dec32_cbrt
234 #define cbrtd64x dec64x_cbrt
235 #define cbrtd64 dec64_cbrt
236 #define cbrtf128x flt128x_cbrt
237 #define cbrtf128 flt128_cbrt
238 #define cbrtf16 flt16_cbrt
239 #define cbrtf32x flt32x_cbrt
240 #define cbrtf32 flt32_cbrt
241 #define cbrtf64x flt64x_cbrt
242 #define cbrtf64 flt64_cbrt
243 #define ccosf128x flt128x_ccos
244 #define ccosf128 flt128_ccos
245 #define ccosf32x flt32x_ccos
246 #define ccosf32 flt32_ccos
247 #define ccosf64x flt64x_ccos
248 #define ccosf64 flt64_ccos
249 #define ccoshf128x flt128x_ccosh
250 #define ccoshf128 flt128_ccosh
```

```
#define ccoshf32x flt32x_ccosh
#define ccoshf32 flt32_ccosh
#define ccoshf64x flt64x_ccosh
#define ccoshf64 flt64_ccosh
#define ceild128x dec128x_ceil
#define ceild128 dec128_ceil
#define ceild32 dec32_ceil
#define ceild64x dec64x_ceil
#define ceild64 dec64_ceil
#define ceilf128x flt128x_ceil
#define ceilf128 flt128_ceil
#define ceilf16 flt16_ceil
#define ceilf32x flt32x_ceil
#define ceilf32 flt32_ceil
#define ceilf64x flt64x_ceil
#define ceilf64 flt64_ceil
#define cexpf128x flt128x_cexp
#define cexpf128 flt128_cexp
#define cexpf32x flt32x_cexp
#define cexpf32 flt32_cexp
#define cexpf64x flt64x_cexp
#define cexpf64 flt64_cexp
#define cimagf128x flt128x_cimag
#define cimagf128 flt128_cimag
#define cimagf32x flt32x_cimag
#define cimagf32 flt32_cimag
#define cimagf64x flt64x_cimag
#define cimagf64 flt64_cimag
#define clogf128x flt128x_clog
#define clogf128 flt128_clog
#define clogf32x flt32x_clog
#define clogf32 flt32_clog
#define clogf64x flt64x_clog
#define clogf64 flt64_clog
#define compoundnd128x dec128x_compoundn
#define compoundnd128 dec128_compoundn
#define compoundnd32 dec32_compoundn
#define compoundnd64x dec64x_compoundn
#define compoundnd64 dec64_compoundn
#define compoundnf128x flt128x_compoundn
#define compoundnf128 flt128_compoundn
#define compoundnf16 flt16_compoundn
#define compoundnf32x flt32x_compoundn
#define compoundnf32 flt32_compoundn
#define compoundnf64x flt64x_compoundn
#define compoundnf64 flt64_compoundn
#define compoundnf flt_compoundn
#define compoundnl ldbl_compoundn
#define conjf128x flt128x_conj
#define conjf128 flt128_conj
#define conjf32x flt32x_conj
#define conjf32 flt32_conj
#define conjf64x flt64x_conj
#define conjf64 flt64_conj
#define copysignd128x dec128x_copysign
#define copysignd128 dec128_copysign
#define copysignd32 dec32_copysign
#define copysignd64x dec64x_copysign
#define copysignd64 dec64_copysign
#define copysignf128x flt128x_copysign
#define copysignf128 flt128_copysign
#define copysignf16 flt16_copysign
#define copysignf32x flt32x_copysign
```

```
#define copysignf32 flt32_copysign
#define copysignf64x flt64x_copysign
#define copysignf64 flt64_copysign
#define cosd128x dec128x_cos
#define cosd128 dec128_cos
#define cosd32 dec32_cos
#define cosd64x dec64x_cos
#define cosd64 dec64_cos
#define cosf128x flt128x_cos
#define cosf128 flt128_cos
#define cosf16 flt16_cos
#define cosf32x flt32x_cos
#define cosf32 flt32_cos
#define cosf64x flt64x_cos
#define cosf64 flt64_cos
#define coshd128x dec128x_cosh
#define coshd128 dec128_cosh
#define coshd32 dec32_cosh
#define coshd64x dec64x_cosh
#define coshd64 dec64_cosh
#define coshf128x flt128x_cosh
#define coshf128 flt128_cosh
#define coshf16 flt16_cosh
#define coshf32x flt32x_cosh
#define coshf32 flt32_cosh
#define coshf64x flt64x_cosh
#define coshf64 flt64_cosh
#define cospid128x dec128x_cospi
#define cospid128 dec128_cospi
#define cospid32 dec32_cospi
#define cospid64x dec64x_cospi
#define cospid64 dec64_cospi
#define cospif128x flt128x_cospi
#define cospif128 flt128_cospi
#define cospif16 flt16_cospi
#define cospif32x flt32x_cospi
#define cospif32 flt32_cospi
#define cospif64x flt64x_cospi
#define cospif64 flt64_cospi
#define cospif flt_cospi
#define cospil ldbl_cospi
#define cpowf128x flt128x_cpow
#define cpowf128 flt128_cpow
#define cpowf32x flt32x_cpow
#define cpowf32 flt32_cpow
#define cpowf64x flt64x_cpow
#define cpowf64 flt64_cpow
#define cprojf128x flt128x_cproj
#define cprojf128 flt128_cproj
#define cprojf32x flt32x_cproj
#define cprojf32 flt32_cproj
#define cprojf64x flt64x_cproj
#define cprojf64 flt64_cproj
#define crealf128x flt128x_creal
#define crealf128 flt128_creal
#define crealf32x flt32x_creal
#define crealf32 flt32_creal
#define crealf64x flt64x_creal
#define crealf64 flt64_creal
#define csinf128x flt128x_csin
#define csinf128 flt128_csin
#define csinf32x flt32x_csin
#define csinf32 flt32_csin
```

```
#define csinf64x flt64x_csin
#define csinf64 flt64_csin
#define csinhf128x flt128x_csinh
#define csinhf128 flt128_csinh
#define csinhf32x flt32x_csinh
#define csinhf32 flt32_csinh
#define csinhf64x flt64x_csinh
#define csinhf64 flt64_csinh
#define csqrtf128x flt128x_csqrt
#define csqrtf128 flt128_csqrt
#define csqrtf32x flt32x_csqrt
#define csqrtf32 flt32_csqrt
#define csqrtf64x flt64x_csqrt
#define csqrtf64 flt64_csqrt
#define ctanf128x flt128x_ctan
#define ctanf128 flt128_ctan
#define ctanf32x flt32x_ctan
#define ctanf32 flt32_ctan
#define ctanf64x flt64x_ctan
#define ctanf64 flt64_ctan
#define ctanhf128x flt128x_ctanh
#define ctanhf128 flt128_ctanh
#define ctanhf32x flt32x_ctanh
#define ctanhf32 flt32_ctanh
#define ctanhf64x flt64x_ctanh
#define ctanhf64 flt64_ctanh
#define d128addd128x dec128x_todec128_add
#define d128add todec128_add
#define d128divd128x dec128x_todec128_div
#define d128div todec128_div
#define d128fmad128x dec128x_todec128_fma
#define d128fma todec128_fma
#define d128muld128x dec128x_todec128_mul
#define d128mul todec128_mul
#define d128sqrtd128x dec128x_todec128_sqrt
#define d128sqrt todec128_sqrt
#define d128subd128x dec128x_todec128_sub
#define d128sub todec128_sub
#define d32addd128x dec128x_todec32_add
#define d32addd128 dec128_todec32_add
#define d32addd64x dec64x_todec32_add
#define d32addd64 dec64_todec32_add
#define d32add todec32_add
#define d32divd128x dec128x_todec32_div
#define d32divd128 dec128_todec32_div
#define d32divd64x dec64x_todec32_div
#define d32divd64 dec64_todec32_div
#define d32div todec32_div
#define d32fmad128x dec128x_todec32_fma
#define d32fmad128 dec128_todec32_fma
#define d32fmad64x dec64x_todec32_fma
#define d32fmad64 dec64_todec32_fma
#define d32fma todec32_fma
#define d32muld128x dec128x_todec32_mul
#define d32muld128 dec128_todec32_mul
#define d32muld64x dec64x_todec32_mul
#define d32muld64 dec64_todec32_mul
#define d32mul todec32_mul
#define d32sqrtd128x dec128x_todec32_sqrt
#define d32sqrtd128 dec128_todec32_sqrt
#define d32sqrtd64x dec64x_todec32_sqrt
#define d32sqrtd64 dec64_todec32_sqrt
#define d32sqrt todec32_sqrt
```

```
#define d32subd128x dec128x_todec32_sub
#define d32subd128 dec128_todec32_sub
#define d32subd64x dec64x_todec32_sub
#define d32subd64 dec64_todec32_sub
#define d32sub todec32_sub
#define d64addd128x dec128x_todec64_add
#define d64addd128 dec128_todec64_add
#define d64addd64x dec64x_todec64_add
#define d64add todec64_add
#define d64divd128x dec128x_todec64_div
#define d64divd128 dec128_todec64_div
#define d64divd64x dec64x_todec64_div
#define d64div todec64_div
#define d64fmad128x dec128x_todec64_fma
#define d64fmad128 dec128_todec64_fma
#define d64fmad64x dec64x_todec64_fma
#define d64fma todec64_fma
#define d64muld128x dec128x_todec64_mul
#define d64muld128 dec128_todec64_mul
#define d64muld64x dec64x_todec64_mul
#define d64mul todec64_mul
#define d64sqrtd128x dec128x_todec64_sqrt
#define d64sqrtd128 dec128_todec64_sqrt
#define d64sqrtd64x dec64x_todec64_sqrt
#define d64sqrt todec64_sqrt
#define d64subd128x dec128x_todec64_sub
#define d64subd128 dec128_todec64_sub
#define d64subd64x dec64x_todec64_sub
#define d64sub todec64_sub
#define d64xaddd128x dec128x_todec64x_add
#define d64xaddd128 dec128_todec64x_add
#define d64xadd todec64x_add
#define d64xdivd128x dec128x_todec64x_div
#define d64xdivd128 dec128_todec64x_div
#define d64xdiv todec64x_div
#define d64xfmad128x dec128x_todec64x_fma
#define d64xfmad128 dec128_todec64x_fma
#define d64xfma todec64x_fma
#define d64xmuld128x dec128x_todec64x_mul
#define d64xmuld128 dec128_todec64x_mul
#define d64xmul todec64x_mul
#define d64xsqrtd128x dec128x_todec64x_sqrt
#define d64xsqrtd128 dec128_todec64x_sqrt
#define d64xsqrt todec64x_sqrt
#define d64xsubd128x dec128x_todec64x_sub
#define d64xsubd128 dec128_todec64x_sub
#define d64xsub todec64x_sub
#define daddl ldbl_todbl_add
#define dadd todbl_add
#define ddivl ldbl_todbl_div
#define ddiv todbl_div
#define decodebind128x dec128x_decodebin
#define decodebind128 dec128_decodebin
#define decodebind32 dec32_decodebin
#define decodebind64x dec64x_decodebin
#define decodebind64 dec64_decodebin
#define decodededecd128x dec128x_decodededec
#define decodededecd128 dec128_decodededec
#define decodededecd32 dec32_decodededec
#define decodededecd64x dec64x_decodededec
#define decodededecd64 dec64_decodededec
#define dfmal ldbl_todbl_fma
#define dfma todbl_fma
```

```
#define dmull ldbl_todbl_mul
#define dmul todbl_mul
#define dsqrtl ldbl_todbl_sqrt
#define dsqrt todbl_sqrt
#define dsubl ldbl_todbl_sub
#define dsub todbl_sub
#define encodebind128x dec128x_encodebin
#define encodebind128 dec128_encodebin
#define encodebind32 dec32_encodebin
#define encodebind64x dec64x_encodebin
#define encodebind64 dec64_encodebin
#define encodededecd128x dec128x_encodedec
#define encodededecd128 dec128_encodedec
#define encodededecd32 dec32_encodedec
#define encodededecd64x dec64x_encodedec
#define encodededecd64 dec64_encodedec
#define erfcd128x dec128x_erfc
#define erfcd128 dec128_erfc
#define erfcd32 dec32_erfc
#define erfcd64x dec64x_erfc
#define erfcd64 dec64_erfc
#define erfcf128x flt128x_erfc
#define erfcf128 flt128_erfc
#define erfcf16 flt16_erfc
#define erfcf32x flt32x_erfc
#define erfcf32 flt32_erfc
#define erfcf64x flt64x_erfc
#define erfcf64 flt64_erfc
#define erfd128x dec128x_erf
#define erfd128 dec128_erf
#define erfd32 dec32_erf
#define erfd64x dec64x_erf
#define erfd64 dec64_erf
#define erff128x flt128x_erf
#define erff128 flt128_erf
#define erff16 flt16_erf
#define erff32x flt32x_erf
#define erff32 flt32_erf
#define erff64x flt64x_erf
#define erff64 flt64_erf
#define exp10d128x dec128x_exp10
#define exp10d128 dec128_exp10
#define exp10d32 dec32_exp10
#define exp10d64x dec64x_exp10
#define exp10d64 dec64_exp10
#define exp10f128x flt128x_exp10
#define exp10f128 flt128_exp10
#define exp10f32x flt32x_exp10
#define exp10f32 flt32_exp10
#define exp10f64x flt64x_exp10
#define exp10f64 flt64_exp10
#define exp10f flt_exp10
#define exp10l ldbl_exp10
#define exp10m1d128x dec128x_exp10m1
#define exp10m1d128 dec128_exp10m1
#define exp10m1d32 dec32_exp10m1
#define exp10m1d64x dec64x_exp10m1
#define exp10m1d64 dec64_exp10m1
#define exp10m1f128x flt128x_exp10m1
#define exp10m1f128 flt128_exp10m1
#define exp10m1f32x flt32x_exp10m1
#define exp10m1f32 flt32_exp10m1
#define exp10m1f64x flt64x_exp10m1
```

```
566 #define exp10m1f64 flt64_exp10m1
567 #define exp10m1f flt_exp10m1
568 #define exp10m1l ldbl_exp10m1
569 #define exp2d128x dec128x_exp2
570 #define exp2d128 dec128_exp2
571 #define exp2d32 dec32_exp2
572 #define exp2d64x dec64x_exp2
573 #define exp2d64 dec64_exp2
574 #define exp2f128x flt128x_exp2
575 #define exp2f128 flt128_exp2
576 #define exp2f32x flt32x_exp2
577 #define exp2f32 flt32_exp2
578 #define exp2f64x flt64x_exp2
579 #define exp2f64 flt64_exp2
580 #define exp2m1d128x dec128x_exp2m1
581 #define exp2m1d128 dec128_exp2m1
582 #define exp2m1d32 dec32_exp2m1
583 #define exp2m1d64x dec64x_exp2m1
584 #define exp2m1d64 dec64_exp2m1
585 #define exp2m1f128x flt128x_exp2m1
586 #define exp2m1f128 flt128_exp2m1
587 #define exp2m1f32x flt32x_exp2m1
588 #define exp2m1f32 flt32_exp2m1
589 #define exp2m1f64x flt64x_exp2m1
590 #define exp2m1f64 flt64_exp2m1
591 #define exp2m1f flt_exp2m1
592 #define exp2m1l ldbl_exp2m1
593 #define expd128x dec128x_exp
594 #define expd128 dec128_exp
595 #define expd32 dec32_exp
596 #define expd64x dec64x_exp
597 #define expd64 dec64_exp
598 #define expf128x flt128x_exp
599 #define expf128 flt128_exp
600 #define expf16 flt16_exp
601 #define expf32x flt32x_exp
602 #define expf32 flt32_exp
603 #define expf64x flt64x_exp
604 #define expf64 flt64_exp
605 #define expm1d128x dec128x_expm1
606 #define expm1d128 dec128_expm1
607 #define expm1d32 dec32_expm1
608 #define expm1d64x dec64x_expm1
609 #define expm1d64 dec64_expm1
610 #define expm1f128x flt128x_expm1
611 #define expm1f128 flt128_expm1
612 #define expm1f32x flt32x_expm1
613 #define expm1f32 flt32_expm1
614 #define expm1f64x flt64x_expm1
615 #define expm1f64 flt64_expm1
616 #define f128addf128x flt128x_toflt128_add
617 #define f128add toflt128_add
618 #define f128divf128x flt128x_toflt128_div
619 #define f128div toflt128_div
620 #define f128fmaf128x flt128x_toflt128_fma
621 #define f128fma toflt128_fma
622 #define f128mulf128x flt128x_toflt128_mul
623 #define f128mul toflt128_mul
624 #define f128sqrtf128x flt128x_toflt128_sqrt
625 #define f128sqrt toflt128_sqrt
626 #define f128subf128x flt128x_toflt128_sub
627 #define f128sub toflt128_sub
628 #define f16addf128x flt128x_toflt16_add
```

```
#define f16addf128 flt128_toflt16_add
#define f16addf32x flt32x_toflt16_add
#define f16addf32 flt32_toflt16_add
#define f16addf64x flt64x_toflt16_add
#define f16addf64 flt64_toflt16_add
#define f16add toflt16_add
#define f16divf128x flt128x_toflt16_div
#define f16divf128 flt128_toflt16_div
#define f16divf32x flt32x_toflt16_div
#define f16divf32 flt32_toflt16_div
#define f16divf64x flt64x_toflt16_div
#define f16divf64 flt64_toflt16_div
#define f16div toflt16_div
#define f16fmaf128x flt128x_toflt16_fma
#define f16fmaf128 flt128_toflt16_fma
#define f16fmaf32x flt32x_toflt16_fma
#define f16fmaf32 flt32_toflt16_fma
#define f16fmaf64x flt64x_toflt16_fma
#define f16fmaf64 flt64_toflt16_fma
#define f16fma toflt16_fma
#define f16mulf128x flt128x_toflt16_mul
#define f16mulf128 flt128_toflt16_mul
#define f16mulf32x flt32x_toflt16_mul
#define f16mulf32 flt32_toflt16_mul
#define f16mulf64x flt64x_toflt16_mul
#define f16mulf64 flt64_toflt16_mul
#define f16mul toflt16_mul
#define f16sqrtf128x flt128x_toflt16_sqrt
#define f16sqrtf128 flt128_toflt16_sqrt
#define f16sqrtf32x flt32x_toflt16_sqrt
#define f16sqrtf32 flt32_toflt16_sqrt
#define f16sqrtf64x flt64x_toflt16_sqrt
#define f16sqrtf64 flt64_toflt16_sqrt
#define f16sqrt toflt16_sqrt
#define f16subf128x flt128x_toflt16_sub
#define f16subf128 flt128_toflt16_sub
#define f16subf32x flt32x_toflt16_sub
#define f16subf32 flt32_toflt16_sub
#define f16subf64x flt64x_toflt16_sub
#define f16subf64 flt64_toflt16_sub
#define f16sub toflt16_sub
#define f32addf128x flt128x_toflt32_add
#define f32addf128 flt128_toflt32_add
#define f32addf32x flt32x_toflt32_add
#define f32addf64x flt64x_toflt32_add
#define f32addf64 flt64_toflt32_add
#define f32add toflt32_add
#define f32divf128x flt128x_toflt32_div
#define f32divf128 flt128_toflt32_div
#define f32divf32x flt32x_toflt32_div
#define f32divf64x flt64x_toflt32_div
#define f32divf64 flt64_toflt32_div
#define f32div toflt32_div
#define f32fmaf128x flt128x_toflt32_fma
#define f32fmaf128 flt128_toflt32_fma
#define f32fmaf32x flt32x_toflt32_fma
#define f32fmaf64x flt64x_toflt32_fma
#define f32fmaf64 flt64_toflt32_fma
#define f32fma toflt32_fma
#define f32mulf128x flt128x_toflt32_mul
#define f32mulf128 flt128_toflt32_mul
#define f32mulf32x flt32x_toflt32_mul
#define f32mulf64x flt64x_toflt32_mul
```

```
692 #define f32mulf64 flt64_toflt32_mul
693 #define f32mul toflt32_mul
694 #define f32sqrtf128x flt128x_toflt32_sqrt
695 #define f32sqrtf128 flt128_toflt32_sqrt
696 #define f32sqrtf32x flt32x_toflt32_sqrt
697 #define f32sqrtf64x flt64x_toflt32_sqrt
698 #define f32sqrtf64 flt64_toflt32_sqrt
699 #define f32sqrt toflt32_sqrt
700 #define f32subf128x flt128x_toflt32_sub
701 #define f32subf128 flt128_toflt32_sub
702 #define f32subf32x flt32x_toflt32_sub
703 #define f32subf64x flt64x_toflt32_sub
704 #define f32subf64 flt64_toflt32_sub
705 #define f32sub toflt32_sub
706 #define f32xaddf128x flt128x_toflt32x_add
707 #define f32xaddf128 flt128_toflt32x_add
708 #define f32xaddf64x flt64x_toflt32x_add
709 #define f32xaddf64 flt64_toflt32x_add
710 #define f32xadd toflt32x_add
711 #define f32xdivf128x flt128x_toflt32x_div
712 #define f32xdivf128 flt128_toflt32x_div
713 #define f32xdivf64x flt64x_toflt32x_div
714 #define f32xdivf64 flt64_toflt32x_div
715 #define f32xdiv toflt32x_div
716 #define f32xfmaf128x flt128x_toflt32x_fma
717 #define f32xfmaf128 flt128_toflt32x_fma
718 #define f32xfmaf64x flt64x_toflt32x_fma
719 #define f32xfmaf64 flt64_toflt32x_fma
720 #define f32xfma toflt32x_fma
721 #define f32xmulf128x flt128x_toflt32x_mul
722 #define f32xmulf128 flt128_toflt32x_mul
723 #define f32xmulf64x flt64x_toflt32x_mul
724 #define f32xmulf64 flt64_toflt32x_mul
725 #define f32xmul toflt32x_mul
726 #define f32xsqrtf128x flt128x_toflt32x_sqrt
727 #define f32xsqrtf128 flt128_toflt32x_sqrt
728 #define f32xsqrtf64x flt64x_toflt32x_sqrt
729 #define f32xsqrtf64 flt64_toflt32x_sqrt
730 #define f32xsqrt toflt32x_sqrt
731 #define f32xsubf128x flt128x_toflt32x_sub
732 #define f32xsubf128 flt128_toflt32x_sub
733 #define f32xsubf64x flt64x_toflt32x_sub
734 #define f32xsubf64 flt64_toflt32x_sub
735 #define f32xsub toflt32x_sub
736 #define f64addf128x flt128x_toflt64_add
737 #define f64addf64x flt64x_toflt64_add
738 #define f64add toflt64_add
739 #define f64divf128x flt128x_toflt64_div
740 #define f64divf64x flt64x_toflt64_div
741 #define f64div toflt64_div
742 #define f64fmaf128x flt128x_toflt64_fma
743 #define f64fmaf64x flt64x_toflt64_fma
744 #define f64fma toflt64_fma
745 #define f64mulf128x flt128x_toflt64_mul
746 #define f64mulf64x flt64x_toflt64_mul
747 #define f64mul toflt64_mul
748 #define f64sqrtf128x flt128x_toflt64_sqrt
749 #define f64sqrtf64x flt64x_toflt64_sqrt
750 #define f64sqrt toflt64_sqrt
751 #define f64subf128x flt128x_toflt64_sub
752 #define f64subf64x flt64x_toflt64_sub
753 #define f64sub toflt64_sub
754 #define f64xaddf128x flt128x_toflt64x_add
```

```
#define f64xadd toflt64x_add
#define f64xdivf128x flt128x_toflt64x_div
#define f64xdiv toflt64x_div
#define f64xfmaf128x flt128x_toflt64x_fma
#define f64xfma toflt64x_fma
#define f64xmulf128x flt128x_toflt64x_mul
#define f64xmul toflt64x_mul
#define f64xsqrtf128x flt128x_toflt64x_sqrt
#define f64xsqrt toflt64x_sqrt
#define f64xsubf128x flt128x_toflt64x_sub
#define f64xsub toflt64x_sub
#define fabsd128x dec128x_fabs
#define fabsd128 dec128_fabs
#define fabsd32 dec32_fabs
#define fabsd64x dec64x_fabs
#define fabsd64 dec64_fabs
#define fabsf128x flt128x_fabs
#define fabsf128 flt128_fabs
#define fabsf16 flt16_fabs
#define fabsf32x flt32x_fabs
#define fabsf32 flt32_fabs
#define fabsf64x flt64x_fabs
#define fabsf64 flt64_fabs
#define faddl ldbl_toflt_add
#define fadd toflt_add
#define fdimd128x dec128x_fdim
#define fdimd128 dec128_fdim
#define fdimd32 dec32_fdim
#define fdimd64x dec64x_fdim
#define fdimd64 dec64_fdim
#define fdimf128x flt128x_fdim
#define fdimf128 flt128_fdim
#define fdimf16 flt16_fdim
#define fdimf32x flt32x_fdim
#define fdimf32 flt32_fdim
#define fdimf64x flt64x_fdim
#define fdimf64 flt64_fdim
#define fdivl ldbl_toflt_div
#define fdiv toflt_div
#define fegetmode fe_getmode
#define fesetexcept fe_setexcept
#define fesetmode fe_setmode
#define fetestexceptflag fe_testexceptflag
#define ffmal ldbl_toflt_fma
#define ffma toflt_fma
#define floord128x dec128x_floor
#define floord128 dec128_floor
#define floord32 dec32_floor
#define floorf128x flt128x_floor
#define floorf16 flt16_floor
#define floorf32x flt32x_floor
#define floorf32 flt32_floor
#define fmad128x dec128x_fma
#define fmad128 dec128_fma
#define fmad32 dec32_fma
#define fmad64x dec64x_fma
#define fmad64 dec64_fma
#define fmaf128x flt128x_fma
#define fmaf128 flt128_fma
#define fmaf16 flt16_fma
#define fmaf32x flt32x_fma
#define fmaf32 flt32_fma
#define fmaf64x flt64x_fma
```

```
818 #define fmaf64 flt64_fma
819 #define fmaxd128x dec128x_fmax
820 #define fmaxd128 dec128_fmax
821 #define fmaxd32 dec32_fmax
822 #define fmaxd64x dec64x_fmax
823 #define fmaxd64 dec64_fmax
824 #define fmaxf128x flt128x_fmax
825 #define fmaxf128 flt128_fmax
826 #define fmaxf16 flt16_fmax
827 #define fmaxf32x flt32x_fmax
828 #define fmaxf32 flt32_fmax
829 #define fmaxf64x flt64x_fmax
830 #define fmaxf64 flt64_fmax
831 #define fmaxmagd128x dec128x_fmaxmag
832 #define fmaxmagd128 dec128_fmaxmag
833 #define fmaxmagd32 dec32_fmaxmag
834 #define fmaxmagd64x dec64x_fmaxmag
835 #define fmaxmagd64 dec64_fmaxmag
836 #define fmaxmagf128x flt128x_fmaxmag
837 #define fmaxmagf128 flt128_fmaxmag
838 #define fmaxmagf16 flt16_fmaxmag
839 #define fmaxmagf32x flt32x_fmaxmag
840 #define fmaxmagf32 flt32_fmaxmag
841 #define fmaxmagf64x flt64x_fmaxmag
842 #define fmaxmagf64 flt64_fmaxmag
843 #define fmaxmagf flt_fmaxmag
844 #define fmaxmagl ldbl_fmaxmag
845 #define fmind128x dec128x_fmin
846 #define fmind128 dec128_fmin
847 #define fmind32 dec32_fmin
848 #define fmind64x dec64x_fmin
849 #define fmind64 dec64_fmin
850 #define fminf128x flt128x_fmin
851 #define fminf128 flt128_fmin
852 #define fminf16 flt16_fmin
853 #define fminf32x flt32x_fmin
854 #define fminf32 flt32_fmin
855 #define fminf64x flt64x_fmin
856 #define fminf64 flt64_fmin
857 #define fminmagd128x dec128x_fminmag
858 #define fminmagd128 dec128_fminmag
859 #define fminmagd32 dec32_fminmag
860 #define fminmagd64x dec64x_fminmag
861 #define fminmagd64 dec64_fminmag
862 #define fminmagf128x flt128x_fminmag
863 #define fminmagf128 flt128_fminmag
864 #define fminmagf16 flt16_fminmag
865 #define fminmagf32x flt32x_fminmag
866 #define fminmagf32 flt32_fminmag
867 #define fminmagf64x flt64x_fminmag
868 #define fminmagf64 flt64_fminmag
869 #define fminmagf flt_fminmag
870 #define fminmagl ldbl_fminmag
871 #define fmodd128x dec128x_fmod
872 #define fmodd128 dec128_fmod
873 #define fmodd32 dec32_fmod
874 #define fmodd64x dec64x_fmod
875 #define fmodd64 dec64_fmod
876 #define fmodf128x flt128x_fmod
877 #define fmodf128 flt128_fmod
878 #define fmodf16 flt16_fmod
879 #define fmodf32x flt32x_fmod
880 #define fmodf32 flt32_fmod
```

```
#define fmodf64x flt64x_fmod
#define fmodf64 flt64_fmod
#define fmull ldbl_toflt_mul
#define fmul toflt_mul
#define frexpd128x dec128x_frexp
#define frexpd128 dec128_frexp
#define frexpd32 dec32_frexp
#define frexpd64x dec64x_frexp
#define frexpd64 dec64_frexp
#define frexpf128x flt128x_frexp
#define frexpf128 flt128_frexp
#define frexpf16 flt16_frexp
#define frexpf32x flt32x_frexp
#define frexpf32 flt32_frexp
#define frexpf64x flt64x_frexp
#define frexpf64 flt64_frexp
#define fromfpd128x dec128x_toint
#define fromfpd128 dec128_toint
#define fromfpd32 dec32_toint
#define fromfpd64x dec64x_toint
#define fromfpd64 dec64_toint
#define fromfpf128x flt128x_toint
#define fromfpf128 flt128_toint
#define fromfpf16 flt16_toint
#define fromfpf32x flt32x_toint
#define fromfpf32 flt32_toint
#define fromfpf64x flt64x_toint
#define fromfpf64 flt64_toint
#define fromfpf flt_toint
#define fromfpl ldbl_toint
#define fromfpxd128x dec128x_tointx
#define fromfpxd128 dec128_tointx
#define fromfpxd32 dec32_tointx
#define fromfpxd64x dec64x_tointx
#define fromfpxd64 dec64_tointx
#define fromfpxf128x flt128x_tointx
#define fromfpxf128 flt128_tointx
#define fromfpxf16 flt16_tointx
#define fromfpxf32x flt32x_tointx
#define fromfpxf32 flt32_tointx
#define fromfpxf64x flt64x_tointx
#define fromfpxf64 flt64_tointx
#define fromfpxf flt_tointx
#define fromfpxl ldbl_tointx
#define fromfpx tointx
#define fromfp toint
#define fsqrtl ldbl_toflt_sqrt
#define fsqrt toflt_sqrt
#define fsubl ldbl_toflt_sub
#define fsub toflt_sub
#define getpayloadd128x dec128x_getpayload
#define getpayloadd128 dec128_getpayload
#define getpayloadd32 dec32_getpayload
#define getpayloadd64x dec64x_getpayload
#define getpayloadd64 dec64_getpayload
#define getpayloadf128x flt128x_getpayload
#define getpayloadf128 flt128_getpayload
#define getpayloadf16 flt16_getpayload
#define getpayloadf32x flt32x_getpayload
#define getpayloadf32 flt32_getpayload
#define getpayloadf64x flt64x_getpayload
#define getpayloadf64 flt64_getpayload
#define getpayloadf flt_getpayload
```

```
944 #define getpayloadl ldbl_getpayload
945 #define hypotd128x dec128x_hypot
946 #define hypotd128 dec128_hypot
947 #define hypotd32 dec32_hypot
948 #define hypotd64x dec64x_hypot
949 #define hypotd64 dec64_hypot
950 #define hypotf128x flt128x_hypot
951 #define hypotf128 flt128_hypot
952 #define hypotf16 flt16_hypot
953 #define hypotf32x flt32x_hypot
954 #define hypotf32 flt32_hypot
955 #define hypotf64x flt64x_hypot
956 #define hypotf64 flt64_hypot
957 #define ilogbd128x dec128x_ilogb
958 #define ilogbd128 dec128_ilogb
959 #define ilogbd32 dec32_ilogb
960 #define ilogbd64x dec64x_ilogb
961 #define ilogbd64 dec64_ilogb
962 #define ilogbf128x flt128x_ilogb
963 #define ilogbf128 flt128_ilogb
964 #define ilogbf16 flt16_ilogb
965 #define ilogbf32x flt32x_ilogb
966 #define ilogbf32 flt32_ilogb
967 #define ilogbf64x flt64x_ilogb
968 #define ilogbf64 flt64_ilogb
969 #define ldexpd128x dec128x_ldexp
970 #define ldexpd128 dec128_ldexp
971 #define ldexpd32 dec32_ldexp
972 #define ldexpd64x dec64x_ldexp
973 #define ldexpd64 dec64_ldexp
974 #define ldexpf128x flt128x_ldexp
975 #define ldexpf128 flt128_ldexp
976 #define ldexpf16 flt16_ldexp
977 #define ldexpf32x flt32x_ldexp
978 #define ldexpf32 flt32_ldexp
979 #define ldexpf64x flt64x_ldexp
980 #define ldexpf64 flt64_ldexp
981 #define lgammad128x dec128x_lgamma
982 #define lgammad128 dec128_lgamma
983 #define lgammad32 dec32_lgamma
984 #define lgammad64x dec64x_lgamma
985 #define lgammad64 dec64_lgamma
986 #define lgammaf128x flt128x_lgamma
987 #define lgammaf128 flt128_lgamma
988 #define lgammaf16 flt16_lgamma
989 #define lgammaf32x flt32x_lgamma
990 #define lgammaf32 flt32_lgamma
991 #define lgammaf64x flt64x_lgamma
992 #define lgammaf64 flt64_lgamma
993 #define llogbd128x dec128x_toint_logb
994 #define llogbd128 dec128_toint_logb
995 #define llogbd32 dec32_toint_logb
996 #define llogbd64x dec64x_toint_logb
997 #define llogbd64 dec64_toint_logb
998 #define llogbf128x flt128x_toint_logb
999 #define llogbf128 flt128_toint_logb
1000 #define llogbf16 flt16_toint_logb
1001 #define llogbf32x flt32x_toint_logb
1002 #define llogbf32 flt32_toint_logb
1003 #define llogbf64x flt64x_toint_logb
1004 #define llogbf64 flt64_toint_logb
1005 #define llogbf flt_toint_logb
1006 #define llogbl ldbl_toint_logb
```

```
#define llogb toint_logb
#define llquantexpd128x dec128x_toint_quantexp
#define llquantexpd128 dec128_toint_quantexp
#define llquantexpd32 dec32_toint_quantexp
#define llquantexpd64x dec64x_toint_quantexp
#define llquantexpd64 dec64_toint_quantexp
#define llquantexpf128x flt128x_toint_quantexp
#define llquantexpf128 flt128_toint_quantexp
#define llquantexpf16 flt16_toint_quantexp
#define llquantexpf32x flt32x_toint_quantexp
#define llquantexpf32 flt32_toint_quantexp
#define llquantexpf64x flt64x_toint_quantexp
#define llquantexpf64 flt64_toint_quantexp
#define llquantexp toint_quantexp
#define llrintd128x dec128x_llrint
#define llrintd128 dec128_llrint
#define llrintd32 dec32_llrint
#define llrintd64x dec64x_llrint
#define llrintd64 dec64_llrint
#define llrintf128x flt128x_llrint
#define llrintf128 flt128_llrint
#define llrintf16 flt16_llrint
#define llrintf32x flt32x_llrint
#define llrintf32 flt32_llrint
#define llrintf64x flt64x_llrint
#define llrintf64 flt64_llrint
#define llroundd128x dec128x_llround
#define llroundd128 dec128_llround
#define llroundd32 dec32_llround
#define llroundd64x dec64x_llround
#define llroundd64 dec64_llround
#define llroundf128x flt128x_llround
#define llroundf128 flt128_llround
#define llroundf16 flt16_llround
#define llroundf32x flt32x_llround
#define llroundf32 flt32_llround
#define llroundf64x flt64x_llround
#define llroundf64 flt64_llround
#define log10d128x dec128x_log10
#define log10d128 dec128_log10
#define log10d32 dec32_log10
#define log10d64x dec64x_log10
#define log10d64 dec64_log10
#define log10f128x flt128x_log10
#define log10f128 flt128_log10
#define log10f32x flt32x_log10
#define log10f32 flt32_log10
#define log10f64x flt64x_log10
#define log10f64 flt64_log10
#define log10p1d128x dec128x_log10p1
#define log10p1d128 dec128_log10p1
#define log10p1d32 dec32_log10p1
#define log10p1d64x dec64x_log10p1
#define log10p1d64 dec64_log10p1
#define log10p1f128x flt128x_log10p1
#define log10p1f128 flt128_log10p1
#define log10p1f32x flt32x_log10p1
#define log10p1f32 flt32_log10p1
#define log10p1f64x flt64x_log10p1
#define log10p1f64 flt64_log10p1
#define log10p1f flt_log10p1
#define log10p1l ldbl_log10p1
#define log1pd128x dec128x_log1p
```

```
#define log1pd128 dec128_log1p
#define log1pd32 dec32_log1p
#define log1pd64x dec64x_log1p
#define log1pd64 dec64_log1p
#define log1pf128x flt128x_log1p
#define log1pf128 flt128_log1p
#define log1pf32x flt32x_log1p
#define log1pf32 flt32_log1p
#define log1pf64x flt64x_log1p
#define log1pf64 flt64_log1p
#define log2d128x dec128x_log2
#define log2d128 dec128_log2
#define log2d32 dec32_log2
#define log2d64x dec64x_log2
#define log2d64 dec64_log2
#define log2f128x flt128x_log2
#define log2f128 flt128_log2
#define log2f32x flt32x_log2
#define log2f32 flt32_log2
#define log2f64x flt64x_log2
#define log2f64 flt64_log2
#define log2p1d128x dec128x_log2p1
#define log2p1d128 dec128_log2p1
#define log2p1d32 dec32_log2p1
#define log2p1d64x dec64x_log2p1
#define log2p1d64 dec64_log2p1
#define log2p1f128x flt128x_log2p1
#define log2p1f128 flt128_log2p1
#define log2p1f32x flt32x_log2p1
#define log2p1f32 flt32_log2p1
#define log2p1f64x flt64x_log2p1
#define log2p1f64 flt64_log2p1
#define log2p1f flt_log2p1
#define log2p1l ldbl_log2p1
#define logbd128x dec128x_logb
#define logbd128 dec128_logb
#define logbd32 dec32_logb
#define logbd64x dec64x_logb
#define logbd64 dec64_logb
#define logbf128x flt128x_logb
#define logbf128 flt128_logb
#define logbf16 flt16_logb
#define logbf32x flt32x_logb
#define logbf32 flt32_logb
#define logbf64x flt64x_logb
#define logbf64 flt64_logb
#define logd128x dec128x_log
#define logd128 dec128_log
#define logd32 dec32_log
#define logd64x dec64x_log
#define logd64 dec64_log
#define logf128x flt128x_log
#define logf128 flt128_log
#define logf16 flt16_log
#define logf32x flt32x_log
#define logf32 flt32_log
#define logf64x flt64x_log
#define logf64 flt64_log
#define logp1d128x dec128x_logp1
#define logp1d128 dec128_logp1
#define logp1d32 dec32_logp1
#define logp1d64x dec64x_logp1
#define logp1d64 dec64_logp1
```

```
#define logp1f128x flt128x_logp1
#define logp1f128 flt128_logp1
#define logp1f32x flt32x_logp1
#define logp1f32 flt32_logp1
#define logp1f64x flt64x_logp1
#define logp1f64 flt64_logp1
#define logp1f flt_logp1
#define logp1l ldbl_logp1
#define lrintd128x dec128x_lrint
#define lrintd128 dec128_lrint
#define lrintd32 dec32_lrint
#define lrintd64x dec64x_lrint
#define lrintd64 dec64_lrint
#define lrintf128x flt128x_lrint
#define lrintf128 flt128_lrint
#define lrintf16 flt16_lrint
#define lrintf32x flt32x_lrint
#define lrintf32 flt32_lrint
#define lrintf64x flt64x_lrint
#define lrintf64 flt64_lrint
#define lroundd128x dec128x_lround
#define lroundd128 dec128_lround
#define lroundd32 dec32_lround
#define lroundd64x dec64x_lround
#define lroundd64 dec64_lround
#define lroundf128x flt128x_lround
#define lroundf128 flt128_lround
#define lroundf16 flt16_lround
#define lroundf32x flt32x_lround
#define lroundf32 flt32_lround
#define lroundf64x flt64x_lround
#define lroundf64 flt64_lround
#define modfd128x dec128x_modf
#define modfd128 dec128_modf
#define modfd32 dec32_modf
#define modfd64x dec64x_modf
#define modfd64 dec64_modf
#define modff128x flt128x_modf
#define modff128 flt128_modf
#define modff16 flt16_modf
#define modff32x flt32x_modf
#define modff32 flt32_modf
#define modff64x flt64x_modf
#define modff64 flt64_modf
#define nand128x dec128x_nan
#define nand128 dec128_nan
#define nand32 dec32_nan
#define nand64x dec64x_nan
#define nand64 dec64_nan
#define nanf128x flt128x_nan
#define nanf128 flt128_nan
#define nanf16 flt16_nan
#define nanf32x flt32x_nan
#define nanf32 flt32_nan
#define nanf64x flt64x_nan
#define nanf64 flt64_nan
#define nearbyintd128x dec128x_nearbyint
#define nearbyintd128 dec128_nearbyint
#define nearbyintd32 dec32_nearbyint
#define nearbyintd64x dec64x_nearbyint
#define nearbyintd64 dec64_nearbyint
#define nearbyintf128x flt128x_nearbyint
#define nearbyintf128 flt128_nearbyint
```

```
1196 #define nearbyintf16 flt16_nearbyint
1197 #define nearbyintf32x flt32x_nearbyint
1198 #define nearbyintf32 flt32_nearbyint
1199 #define nearbyintf64x flt64x_nearbyint
1200 #define nearbyintf64 flt64_nearbyint
1201 #define nextafterd128x dec128x_nextafter
1202 #define nextafterd128 dec128_nextafter
1203 #define nextafterd32 dec32_nextafter
1204 #define nextafterd64x dec64x_nextafter
1205 #define nextafterd64 dec64_nextafter
1206 #define nextafterf128x flt128x_nextafter
1207 #define nextafterf128 flt128_nextafter
1208 #define nextafterf16 flt16_nextafter
1209 #define nextafterf32x flt32x_nextafter
1210 #define nextafterf32 flt32_nextafter
1211 #define nextafterf64x flt64x_nextafter
1212 #define nextafterf64 flt64_nextafter
1213 #define nextdownd128x dec128x_nextdown
1214 #define nextdownd128 dec128_nextdown
1215 #define nextdownd32 dec32_nextdown
1216 #define nextdownd64x dec64x_nextdown
1217 #define nextdownd64 dec64_nextdown
1218 #define nextdownf128x flt128x_nextdown
1219 #define nextdownf128 flt128_nextdown
1220 #define nextdownf16 flt16_nextdown
1221 #define nextdownf32x flt32x_nextdown
1222 #define nextdownf32 flt32_nextdown
1223 #define nextdownf64x flt64x_nextdown
1224 #define nextdownf64 flt64_nextdown
1225 #define nextdownf flt_nextdown
1226 #define nextdownl ldbl_nextdown
1227 #define nexttowardd128x dec128x_nexttoward
1228 #define nexttowardd128 dec128_nexttoward
1229 #define nexttowardd32 dec32_nexttoward
1230 #define nexttowardd64x dec64x_nexttoward
1231 #define nexttowardd64 dec64_nexttoward
1232 #define nexttowardf128x flt128x_nexttoward
1233 #define nexttowardf128 flt128_nexttoward
1234 #define nexttowardf16 flt16_nexttoward
1235 #define nexttowardf32x flt32x_nexttoward
1236 #define nexttowardf32 flt32_nexttoward
1237 #define nexttowardf64x flt64x_nexttoward
1238 #define nexttowardf64 flt64_nexttoward
1239 #define nextupd128x dec128x_nextup
1240 #define nextupd128 dec128_nextup
1241 #define nextupd32 dec32_nextup
1242 #define nextupd64x dec64x_nextup
1243 #define nextupd64 dec64_nextup
1244 #define nextupf128x flt128x_nextup
1245 #define nextupf128 flt128_nextup
1246 #define nextupf16 flt16_nextup
1247 #define nextupf32x flt32x_nextup
1248 #define nextupf32 flt32_nextup
1249 #define nextupf64x flt64x_nextup
1250 #define nextupf64 flt64_nextup
1251 #define nextupf flt_nextup
1252 #define nextupl ldbl_nextup
1253 #define powd128x dec128x_pow
1254 #define powd128 dec128_pow
1255 #define powd32 dec32_pow
1256 #define powd64x dec64x_pow
1257 #define powd64 dec64_pow
1258 #define powf128x flt128x_pow
```

```
#define powf128 flt128_pow
#define powf16 flt16_pow
#define powf32x flt32x_pow
#define powf32 flt32_pow
#define powf64x flt64x_pow
#define powf64 flt64_pow
#define pownd128x dec128x_pown
#define pownd128 dec128_pown
#define pownd32 dec32_pown
#define pownd64x dec64x_pown
#define pownd64 dec64_pown
#define pownf128x flt128x_pown
#define pownf128 flt128_pown
#define pownf16 flt16_pown
#define pownf32x flt32x_pown
#define pownf32 flt32_pown
#define pownf64x flt64x_pown
#define pownf64 flt64_pown
#define pownf flt_pown
#define pownl ldbl_pown
#define powrd128x dec128x_powr
#define powrd128 dec128_powr
#define powrd32 dec32_powr
#define powrd64x dec64x_powr
#define powrd64 dec64_powr
#define powrf128x flt128x_powr
#define powrf128 flt128_powr
#define powrf16 flt16_powr
#define powrf32x flt32x_powr
#define powrf32 flt32_powr
#define powrf64x flt64x_powr
#define powrf64 flt64_powr
#define powrf flt_powr
#define powrl ldbl_powr
#define quantized128x dec128x_quantize
#define quantized128 dec128_quantize
#define quantized32 dec32_quantize
#define quantized64x dec64x_quantize
#define quantized64 dec64_quantize
#define quantizef128x flt128x_quantize
#define quantizef128 flt128_quantize
#define quantizef16 flt16_quantize
#define quantizef32x flt32x_quantize
#define quantizef32 flt32_quantize
#define quantizef64x flt64x_quantize
#define quantizef64 flt64_quantize
#define quantumd128x dec128x_quantum
#define quantumd128 dec128_quantum
#define quantumd32 dec32_quantum
#define quantumd64x dec64x_quantum
#define quantumd64 dec64_quantum
#define quantumf128x flt128x_quantum
#define quantumf128 flt128_quantum
#define quantumf16 flt16_quantum
#define quantumf32x flt32x_quantum
#define quantumf32 flt32_quantum
#define quantumf64x flt64x_quantum
#define quantumf64 flt64_quantum
#define remainderd128x dec128x_remainder
#define remainderd128 dec128_remainder
#define remainderd32 dec32_remainder
#define remainderd64x dec64x_remainder
#define remainderd64 dec64_remainder
```

```
1322 #define remainderf128x flt128x_remainder
1323 #define remainderf128 flt128_remainder
1324 #define remainderf16 flt16_remainder
1325 #define remainderf32x flt32x_remainder
1326 #define remainderf32 flt32_remainder
1327 #define remainderf64x flt64x_remainder
1328 #define remainderf64 flt64_remainder
1329 #define rintd128x dec128x_rint
1330 #define rintd128 dec128_rint
1331 #define rintd32 dec32_rint
1332 #define rintd64x dec64x_rint
1333 #define rintd64 dec64_rint
1334 #define rintf128x flt128x_rint
1335 #define rintf128 flt128_rint
1336 #define rintf16 flt16_rint
1337 #define rintf32x flt32x_rint
1338 #define rintf32 flt32_rint
1339 #define rintf64x flt64x_rint
1340 #define rintf64 flt64_rint
1341 #define rootnd128x dec128x_rootn
1342 #define rootnd128 dec128_rootn
1343 #define rootnd32 dec32_rootn
1344 #define rootnd64x dec64x_rootn
1345 #define rootnd64 dec64_rootn
1346 #define rootnf128x flt128x_rootn
1347 #define rootnf128 flt128_rootn
1348 #define rootnf16 flt16_rootn
1349 #define rootnf32x flt32x_rootn
1350 #define rootnf32 flt32_rootn
1351 #define rootnf64x flt64x_rootn
1352 #define rootnf64 flt64_rootn
1353 #define rootnf flt_rootn
1354 #define rootnl ldbl_rootn
1355 #define roundd128x dec128x_round
1356 #define roundd128 dec128_round
1357 #define roundd32 dec32_round
1358 #define roundd64x dec64x_round
1359 #define roundd64 dec64_round
1360 #define roundevend128x dec128x_roundeven
1361 #define roundevend128 dec128_roundeven
1362 #define roundevend32 dec32_roundeven
1363 #define roundevend64x dec64x_roundeven
1364 #define roundevend64 dec64_roundeven
1365 #define roundevenf128x flt128x_roundeven
1366 #define roundevenf128 flt128_roundeven
1367 #define roundevenf16 flt16_roundeven
1368 #define roundevenf32x flt32x_roundeven
1369 #define roundevenf32 flt32_roundeven
1370 #define roundevenf64x flt64x_roundeven
1371 #define roundevenf64 flt64_roundeven
1372 #define roundevenf flt_roundeven
1373 #define roundevenl ldbl_roundeven
1374 #define roundf128x flt128x_round
1375 #define roundf128 flt128_round
1376 #define roundf16 flt16_round
1377 #define roundf32x flt32x_round
1378 #define roundf32 flt32_round
1379 #define roundf64x flt64x_round
1380 #define roundf64 flt64_round
1381 #define rsqrtd128x dec128x_rsqrt
1382 #define rsqrtd128 dec128_rsqrt
1383 #define rsqrtd32 dec32_rsqrt
1384 #define rsqrtd64x dec64x_rsqrt
```

```
#define rsqrtd64 dec64_rsqrt
#define rsqrtf128x flt128x_rsqrt
#define rsqrtf128 flt128_rsqrt
#define rsqrtf16 flt16_rsqrt
#define rsqrtf32x flt32x_rsqrt
#define rsqrtf32 flt32_rsqrt
#define rsqrtf64x flt64x_rsqrt
#define rsqrtf64 flt64_rsqrt
#define rsqrtf flt_rsqrt
#define rsqrtl ldbl_rsqrt
#define samequantumd128x dec128x_samequantum
#define samequantumd128 dec128_samequantum
#define samequantumd32 dec32_samequantum
#define samequantumd64x dec64x_samequantum
#define samequantumd64 dec64_samequantum
#define samequantumf128x flt128x_samequantum
#define samequantumf128 flt128_samequantum
#define samequantumf16 flt16_samequantum
#define samequantumf32x flt32x_samequantum
#define samequantumf32 flt32_samequantum
#define samequantumf64x flt64x_samequantum
#define samequantumf64 flt64_samequantum
#define scalblnd128x dec128x_scalbln
#define scalblnd128 dec128_scalbln
#define scalblnd32 dec32_scalbln
#define scalblnd64x dec64x_scalbln
#define scalblnd64 dec64_scalbln
#define scalblnf128x flt128x_scalbln
#define scalblnf128 flt128_scalbln
#define scalblnf16 flt16_scalbln
#define scalblnf32x flt32x_scalbln
#define scalblnf32 flt32_scalbln
#define scalblnf64x flt64x_scalbln
#define scalblnf64 flt64_scalbln
#define scalbnd128x dec128x_scalbn
#define scalbnd128 dec128_scalbn
#define scalbnd32 dec32_scalbn
#define scalbnd64x dec64x_scalbn
#define scalbnd64 dec64_scalbn
#define scalbnf128x flt128x_scalbn
#define scalbnf128 flt128_scalbn
#define scalbnf16 flt16_scalbn
#define scalbnf32x flt32x_scalbn
#define scalbnf32 flt32_scalbn
#define scalbnf64x flt64x_scalbn
#define scalbnf64 flt64_scalbn
#define setpayloadd128x dec128x_setpayload
#define setpayloadd128 dec128_setpayload
#define setpayloadd32 dec32_setpayload
#define setpayloadd64x dec64x_setpayload
#define setpayloadd64 dec64_setpayload
#define setpayloadf128x flt128x_setpayload
#define setpayloadf128 flt128_setpayload
#define setpayloadf16 flt16_setpayload
#define setpayloadf32x flt32x_setpayload
#define setpayloadf32 flt32_setpayload
#define setpayloadf64x flt64x_setpayload
#define setpayloadf64 flt64_setpayload
#define setpayloadf flt_setpayload
#define setpayloadl ldbl_setpayload
#define setpayloadsigd128x dec128x_setpayloadsig
#define setpayloadsigd128 dec128_setpayloadsig
#define setpayloadsigd32 dec32_setpayloadsig
```

```
1448 #define setpayloadsigd64x dec64x_setpayloadsig
1449 #define setpayloadsigd64 dec64_setpayloadsig
1450 #define setpayloadsigf128x flt128x_setpayloadsig
1451 #define setpayloadsigf128 flt128_setpayloadsig
1452 #define setpayloadsigf16 flt16_setpayloadsig
1453 #define setpayloadsigf32x flt32x_setpayloadsig
1454 #define setpayloadsigf32 flt32_setpayloadsig
1455 #define setpayloadsigf64x flt64x_setpayloadsig
1456 #define setpayloadsigf64 flt64_setpayloadsig
1457 #define setpayloadsigf flt_setpayloadsig
1458 #define setpayloadsigl ldbl_setpayloadsig
1459 #define sind128x dec128x_sin
1460 #define sind128 dec128_sin
1461 #define sind32 dec32_sin
1462 #define sind64x dec64x_sin
1463 #define sind64 dec64_sin
1464 #define sinf128x flt128x_sin
1465 #define sinf128 flt128_sin
1466 #define sinf16 flt16_sin
1467 #define sinf32x flt32x_sin
1468 #define sinf32 flt32_sin
1469 #define sinf64x flt64x_sin
1470 #define sinf64 flt64_sin
1471 #define sinhd128x dec128x_sinh
1472 #define sinhd128 dec128_sinh
1473 #define sinhd32 dec32_sinh
1474 #define sinhd64x dec64x_sinh
1475 #define sinhd64 dec64_sinh
1476 #define sinhf128x flt128x_sinh
1477 #define sinhf128 flt128_sinh
1478 #define sinhf16 flt16_sinh
1479 #define sinhf32x flt32x_sinh
1480 #define sinhf32 flt32_sinh
1481 #define sinhf64x flt64x_sinh
1482 #define sinhf64 flt64_sinh
1483 #define sinpid128x dec128x_sinpi
1484 #define sinpid128 dec128_sinpi
1485 #define sinpid32 dec32_sinpi
1486 #define sinpid64x dec64x_sinpi
1487 #define sinpid64 dec64_sinpi
1488 #define sinpif128x flt128x_sinpi
1489 #define sinpif128 flt128_sinpi
1490 #define sinpif16 flt16_sinpi
1491 #define sinpif32x flt32x_sinpi
1492 #define sinpif32 flt32_sinpi
1493 #define sinpif64x flt64x_sinpi
1494 #define sinpif64 flt64_sinpi
1495 #define sinpif flt_sinpi
1496 #define sinpil ldbl_sinpi
1497 #define sqrtd128x dec128x_sqrt
1498 #define sqrtd128 dec128_sqrt
1499 #define sqrtd32 dec32_sqrt
1500 #define sqrtd64x dec64x_sqrt
1501 #define sqrtd64 dec64_sqrt
1502 #define sqrtf128x flt128x_sqrt
1503 #define sqrtf128 flt128_sqrt
1504 #define sqrtf16 flt16_sqrt
1505 #define sqrtf32x flt32x_sqrt
1506 #define sqrtf32 flt32_sqrt
1507 #define sqrtf64x flt64x_sqrt
1508 #define sqrtf64 flt64_sqrt
1509 #define tand128x dec128x_tan
1510 #define tand128 dec128_tan
```

```
#define tand32 dec32_tan
#define tand64x dec64x_tan
#define tand64 dec64_tan
#define tanf128x flt128x_tan
#define tanf128 flt128_tan
#define tanf16 flt16_tan
#define tanf32x flt32x_tan
#define tanf32 flt32_tan
#define tanf64x flt64x_tan
#define tanf64 flt64_tan
#define tanhd128x dec128x_tanh
#define tanhd128 dec128_tanh
#define tanhd32 dec32_tanh
#define tanhd64x dec64x_tanh
#define tanhd64 dec64_tanh
#define tanhf128x flt128x_tanh
#define tanhf128 flt128_tanh
#define tanhf16 flt16_tanh
#define tanhf32x flt32x_tanh
#define tanhf32 flt32_tanh
#define tanhf64x flt64x_tanh
#define tanhf64 flt64_tanh
#define tanpid128x dec128x_tanpi
#define tanpid128 dec128_tanpi
#define tanpid32 dec32_tanpi
#define tanpid64x dec64x_tanpi
#define tanpid64 dec64_tanpi
#define tanpif128x flt128x_tanpi
#define tanpif128 flt128_tanpi
#define tanpif16 flt16_tanpi
#define tanpif32x flt32x_tanpi
#define tanpif32 flt32_tanpi
#define tanpif64x flt64x_tanpi
#define tanpif64 flt64_tanpi
#define tanpif flt_tanpi
#define tanpil ldbl_tanpi
#define tgammad128x dec128x_tgamma
#define tgammad128 dec128_tgamma
#define tgammad32 dec32_tgamma
#define tgammad64x dec64x_tgamma
#define tgammad64 dec64_tgamma
#define tgammaf128x flt128x_tgamma
#define tgammaf128 flt128_tgamma
#define tgammaf16 flt16_tgamma
#define tgammaf32x flt32x_tgamma
#define tgammaf32 flt32_tgamma
#define tgammaf64x flt64x_tgamma
#define tgammaf64 flt64_tgamma
#define truncd128x dec128x_trunc
#define truncd128 dec128_trunc
#define truncd32 dec32_trunc
#define truncd64x dec64x_trunc
#define truncd64 dec64_trunc
#define truncf128x flt128x_trunc
#define truncf128 flt128_trunc
#define truncf16 flt16_trunc
#define truncf32x flt32x_trunc
#define truncf32 flt32_trunc
#define truncf64x flt64x_trunc
#define truncf64 flt64_trunc
#define ufromfpd128x dec128x_touint
#define ufromfpd128 dec128_touint
#define ufromfpd32 dec32_touint
```

```
1574 #define ufromfpd64x dec64x_touint
1575 #define ufromfpd64 dec64_touint
1576 #define ufromfpf128x flt128x_touint
1577 #define ufromfpf128 flt128_touint
1578 #define ufromfpf16 flt16_touint
1579 #define ufromfpf32x flt32x_touint
1580 #define ufromfpf32 flt32_touint
1581 #define ufromfpf64x flt64x_touint
1582 #define ufromfpf64 flt64_touint
1583 #define ufromfpf flt_touint
1584 #define ufromfpl ldbl_touint
1585 #define ufromfpxd128x dec128x_touintx
1586 #define ufromfpxd128 dec128_touintx
1587 #define ufromfpxd32 dec32_touintx
1588 #define ufromfpxd64x dec64x_touintx
1589 #define ufromfpxd64 dec64_touintx
1590 #define ufromfpxf128x flt128x_touintx
1591 #define ufromfpxf128 flt128_touintx
1592 #define ufromfpxf16 flt16_touintx
1593 #define ufromfpxf32x flt32x_touintx
1594 #define ufromfpxf32 flt32_touintx
1595 #define ufromfpxf64x flt64x_touintx
1596 #define ufromfpxf64 flt64_touintx
1597 #define ufromfpxf flt_touintx
1598 #define ufromfpxl ldbl_touintx
1599 #define ufromfpx touintx
1600 #define ufromfp touint
1601 #define _Decimal32_t dec32_eval_t
1602 #define _Decimal64_t dec64_eval_t
1603 #define _Decimal128_t dec128_eval_t
1604 #define _Float32_t flt32_eval_t
1605 #define _Float64_t flt64_eval_t
1606 #define _Float128_t flt128_eval_t
1607 #define _Decimal32 dec32_t
1608 #define _Decimal64 dec64_t
1609 #define _Decimal128 dec128_t
1610 #define _Float32 flt32_t
1611 #define _Float64 flt64_t
1612 #define _Float128 flt128_t
1613 #define _Decimal32x dec32x_t
1614 #define _Decimal64x dec64x_t
1615 #define _Decimal128x dec128x_t
1616 #define _Float32x flt32x_t
1617 #define _Float64x flt64x_t
1618 #define _Float128x flt128x_t
```