C Floating Point Study Group Teleconference
2023-02-28
8 AM PST / 10 PM EST / 4 PM UTC

Attendees:
  Damian McGuckin,
  David Hough,
  Fred Tydeman,
  Hans Boehm,
  Ian McIntosh,
  Jim Thomas,
  Mike Cowlishaw,
  Paul Zimmermann,
  Rajan Bhakta,
  Vivian Van Loan

None.

Previous meeting minutes:
(Posted on CFP wiki)

Next Meeting(s):
  March 29, 8 AM PDT / 11 PM EDT / 3 PM UTC
  ISO Zoom teleconference
  Please notify the group if this time slot does not work.

Last meeting carry-over action items:
  Done unless specified otherwise.
  Details below in "Carry-over action items results" section.

Last meeting action items:
  Done unless specified otherwise.
  Details below in “Action items results” section.

New action items:
  Jim to submit [Cfp-interest 2684] as a CD2 comment.
  Jim to submit [Cfp-interest 2686] as a CD2 comment.
**C++ liaison:**
Floating point rounding modes
Lots of email discussion
Hans presented slides (will be emailed to reflector after meeting).
fenv rounding issues
interacts with constexpr
FENV_ACCESS not supported in C++
Uses:
interval arithmetic
run same code with different rounding modes to assess the effect of round-off errors
Problems
no constant folding
effect on library functions
rounding of signed constants
global FP state
Solutions
deprecate fesetround()
add static rounding to C++
correctly rounded math functions with extra argument
(to indicate rounding direction)
correctly rounded FP types
David Hough: Dynamic rounding and compilers are a bad mix.
Static rounding modes are much better.
Likes dynamic exception modes (for debugging)

**Carry-over action items results:**
David H: Get an example for the scaled reduction functions (perhaps by asking Jason or Jim or looking into the IEEE references). - Not done.
See [https://754r.ucbtest.org/background/traps-and-wraps.txt](https://754r.ucbtest.org/background/traps-and-wraps.txt)

David H: Get an example for the augmented arithmetic functions (perhaps by asking Jason or Jim or looking into the IEEE references). - Not done.

**Action item results (from previous meeting):**
Jim: CFP response to US42-169 should be copy the nextafter returns section, changing "nextafter" to "nexttorward".
Jim: Add a link to CFP 2657 into CFP's response for GB-287.
Done:
- [N3105](https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3105.pdf) 2023/02/08 Thomas, Issues with CFP response to NB comments - N3101 update N3105 accept by WG14

Jim: Look at FENV_ROUND and use similar words from FENV_DEC_ROUND (7.6.3#2) to show the distinction between constant rounding modes and dynamic rounding.
Done:
- [Cfp-interest 2684] Re: floating constants issue  Jim Thomas
Jim: Add in something about assuming the decimal point is a single character to the comment for the `#define MAXSIZE` (or mention the C locale is assumed) in H.12.2#4 as a CD2 comment after clearing it with Vincent and an FYI to WG14.
Done:
  • [Cfp-interest 2686] Re: incorrect example H.12.2p4  Jim Thomas

Discussion:
"floating types" and float_t, double_t.
Jim to submit CD2 comment to italicize “real floating types” in 6.2.5#14.
Re definition of float_t, double_t
Fred: Microsoft eval method is not any of float, double, long double,
so, what should float_t be?
No resolution yet for CD2 comment
To be continued in email discussion

"width" issue
No resolution yet for CD2 comment
To be continued in email discussion

TS Part 4 -- minor formatting updates

TS Part 5 -- redone as four separate features
It still has a few issues to be resolved