Proposal for C2X
WG14 N2552

Title: F.3 editorial cleanup for rounding macros
Author, affiliation: C FP group
Date: 2020-08-02
Proposal category: Editorial
Reference: N2124, N2478

The suggested changes below address three editorial issues.

Issue 1:

When N2124 was incorporated into C2X, the macros in the first sentence in F.3 #9 were reordered. In the corresponding reordering of the IEC 60559 rounding-direction attributes, the roundTiesToAway attribute was omitted. This issue was noticed and reported to CFP by Paul Zimmermann in [Cfp-interest 1643].

Issue 2:

IEC 60559 uses the same rounding attribute names for binary and decimal floating-point arithmetic, but says that if both binary and decimal are supported, then they must have separate rounding-direction attributes. Therefore, in C the corresponding macro names are different for binary and decimal. The macros' binding statements in F.3 #9 (for binary) and #19 (for decimal) should say explicitly whether the macros apply to binary or decimal floating-point arithmetic.

Issue 3:

F.3 #9 mentions the use of the macros by the **FENV_ROUND** pragma. The analogous words should be in F.3 #19 for the **FENV_DEC_ROUND** pragma.

Suggested changes:

Change F.3 #9:

[9] The macros (7.6) **FE_DOWNWARD**, **FE_TONEAREST**, **FE_TONEARESTFROMZERO**, **FE_TOWARDZERO**, and **FE_UPWARD**, which are used in conjunction with the **fegetround** and **fesetround** functions and the **FENV_ROUND** pragma, represent the IEC 60559 rounding-direction attributes roundTowardNegative, roundTiesToEven, roundTowardZero, and roundTowardPositive, respectively. Support for the roundTiesToAway attribute for binary floating-point arithmetic, and hence for the **FE_TONEARESTFROMZERO** macro, is optional.

to:

[9] The macros (7.6) **FE_DOWNWARD**, **FE_TONEAREST**, **FE_TONEARESTFROMZERO**, **FE_TOWARDZERO**, and **FE_UPWARD**, which are used in conjunction with the **fegetround** and **fesetround** functions and the **FENV_ROUND** pragma, represent the IEC 60559 rounding-direction attributes roundTowardNegative, roundTiesToEven, roundTiesToAway, roundTowardZero, and roundTowardPositive, respectively, for binary floating-point arithmetic. Support for the roundTiesToAway attribute for binary floating-point arithmetic, and hence for the **FE_TONEARESTFROMZERO** macro, is optional.

And change F.3 #19:

[19] The **fe_dec_getround** (7.6.5.3) and **fe_dec_setround** (7.6.5.6) functions provide the getDecimalRoundingDirection and setDecimalRoundingDirection operations defined in IEC 60559 for decimal floating-point arithmetic. The macros (7.6) **FE_DEC_DOWNWARD**, **FE_DEC_TONEAREST**, **FE_DEC_TONEARESTFROMZERO**, **FE_DEC_TOWARDZERO**, and **FE_DEC_UPWARD**, which are used in conjunction with the **fe_dec_getround** and **fe_dec_setround** functions, represent the IEC 60559 rounding-direction attributes roundTowardNegative, roundTiesToEven, roundTiesToAway, roundTowardZero, and roundTowardPositive, respectively.

to:

[19] The **fe_dec_getround** (7.6.5.3) and **fe_dec_setround** (7.6.5.6) functions provide the getDecimalRoundingDirection and setDecimalRoundingDirection operations defined in IEC 60559 for decimal floating-point arithmetic. The macros (7.6) **FE_DEC_DOWNWARD**, **FE_DEC_TONEAREST**, **FE_DEC_TONEARESTFROMZERO**, **FE_DEC_TOWARDZERO**, and **FE_DEC_UPWARD**, which are used in conjunction with the **fe_dec_getround** and **fe_dec_setround** functions and the **FENV_DEC_ROUND** pragma, represent the IEC 60559 rounding-direction attributes roundTowardNegative, roundTiesToEven, roundTiesToAway, roundTowardZero, and roundTowardPositive, respectively, for decimal floating-point arithmetic.