P2 CR for llquantexp invalid case

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C FP Group

TS 18661-2 CR nn
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Reference Document: TS 18661-2

Subject: llquantexp invalid case

Summary

The llquantexp functions in 12.4.1 of TS 18661-2 compute the quantum exponent of a finite argument (of decimal floating type). Infinities and NaNs don’t have a quantum exponent, so the description in C 7.12.11a.4 says “If \( x \) is infinite or NaN, they compute LLONG_MIN and a domain error occurs.” In similar cases, of a function with floating parameters and integer return type, where no return value is suitable, the “invalid” floating-point exception is raised. Examples in current C include ilogb, lrint, and lround. However, TS 18661-2 neglects to specify raising “invalid” for llquantexp, which was an oversight.

For the C examples above, the specification of “invalid” is in annex F, because the functions are not just for IEC 60559 implementations. The llquantexp functions are only for decimal floating types, which C requires to be IEC 60559 conformant. Therefore, the specification for “invalid” can be in the primary description in 7.12.

CFP has made a similar change for the quantize functions. This was done as an editorial change, because it matches specification for the IEC 60559 quantize operation, whose specification TS 18661 adopts by reference.

Suggested Technical Corrigendum

In TS 18661-2 12.4.1, in C 7.12.11a.4#2, change the second sentence from:

If \( x \) is infinite or NaN, they compute LLONG_MIN and a domain error occurs.

to:

If \( x \) is infinite or NaN, they compute LLONG_MIN, the “invalid” floating-point exception is raised, and a domain error occurs.