

Proposal for C23
WG14 N2845

Title: feraiseexcept update
Author, affiliation: C FP group
Date: 2021-10-10
Proposal category: Editorial
Reference: N2596

F.8.6 has:

[2] If the argument to the **feraiseexcept** function in `<fenv.h>` represents IEC 60559 valid coincident floating-point exceptions for atomic operations (namely "overflow" and "inexact", or "underflow" and "inexact"), then "overflow" or "underflow" is raised before "inexact".

This wording is out of date in two ways.

1. IEC 60559 no longer refers to coincident exceptions. This is for consistency with the fact that the "inexact" exception is signaled by the default handling of the "overflow" or "underflow" exception and is not signaled directly by the operation. Under default exception handling the ordering of the exceptions isn't detectable, but the ordering is needed with alternate exception handling extensions.
2. C has a different meaning for "atomic operations" than is intended here. See 7.17.

The suggested change below updates the statement.

The requirement should not be removed, because code that runs with alternate exception handling extensions might depend on the ordering.

Suggested changes:

Change F.8.6 #2:

[2] If the floating-point exceptions represented by the argument to the **feraiseexcept** function in `<fenv.h>` ~~represents IEC 60559 valid coincident floating-point exceptions for atomic operations (namely "overflow" and "inexact", or "underflow" and "inexact"), then "overflow" or~~ include both "overflow" and "inexact", then "overflow" is raised before "inexact". Similarly, if the represented exceptions include both "underflow" and "inexact", then "underflow" is raised before "inexact".