

**Proposal for C23
WG14 N2881**

Title: Normal and subnormal classification (N2842 update)
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Proposal category: Technical
Reference: N2596, N2842

This document updates N2842 (approved at the November 2021 WG 14 meeting) to allow numbers with full-precision representations to be classified as normal. This accommodates the extra full-precision range of double-double formats.

The only change below to the suggested changes in (approved) N2842 is the addition of the next to last sentence in 7.12.3 #0.

Suggested changes (change marks relative to N2596):

In 7.12 #12, change:

represent ~~the~~ mutually exclusive kinds of floating-point values

In 7.12.3, before the first paragraph, insert:

[0] Floating-point values can be classified as NaN, infinite, normal, subnormal, or zero, or into other implementation-defined categories. Numbers whose magnitude is at least $b^{e_{\min}-1}$ (the minimum magnitude of normalized floating-point numbers in the type) and at most $(1 - b^{-p})b^{e_{\max}}$ (the maximum magnitude of normalized floating-point numbers in the type), where b , p , e_{\min} , and e_{\max} are as in 5.2.4.2.2, are classified as normal. Larger magnitude finite numbers represented with full precision in the type may also be classified as normal. Nonzero numbers whose magnitude is less than $b^{e_{\min}-1}$ are classified as subnormal.