

**Proposal for C2x
WG14 N2119**

Title: TS 18661-4 reduction functions
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Date: 2017-03-05
Proposal category: New features
Target audience: Computation on large numerical data sets, with portable performance

Abstract: This proposal incorporates the ISO/IEC TS 18661-4 reduction functions for `<math.h>` into C2x. These functions provide the reduction operations recommended by the current IEC 60559 floating-point standard (2011). These functions include four sum reductions and three scaled product reductions. Their specification allows implementations to take advantage of platform-specific performance features. These functions avoid intermediate overflow and underflow. The scaled product functions deliver an in-range scaled product with a scale factor, which avoids overflow and underflow where the scaled product itself is an intermediate computation. Another proposal covers the TS 18661-4 functions for IEC 60559 optional mathematical operations.

Prior art: Vector packages commonly include functions to compute sum and product reductions.