Proposal for C2Y
WG14 N3232

Title: Round-trip rounding
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Proposal category: Editorial
Reference: N3219

This proposal addresses an issue reported to CFP by Vincent Lefèvre:

The *-_DECIMAL_DIG macros are defined as follows:

> number of decimal digits, \( n \), such that any floating-point number with \( p \) radix \( b \) digits can be rounded to a floating-point number with \( n \) decimal digits and back again without change to the value, ...

However, this is true only if rounding to nearest is used for these roundings. Ditto for the _DECIMAL_DIG macro.

The same applies to the *-_DIG macros.

**Suggested changes** (change marks relative to N3219):

In 5.2.5.3.3 #31, change:

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number of decimal digits, \( n \), such that any floating-point number with \( p \) radix \( b \) digits can be rounded to a floating-point number with \( n \) decimal digits and back again, **using to-nearest rounding for both roundings**, without change to the value, ...

In 5.2.5.3.3 #31, change:

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number of decimal digits, \( n \), such that any floating-point number in the widest of the supported floating types and the supported ISO/IEC 60559 encodings with \( p_{\text{max}} \) radix \( b \) digits can be rounded to a floating-point number with \( n \) decimal digits and back again, **using to-nearest rounding for both roundings**, without change to the value, ...
In 5.2.5.3.3 #31, change:

— number of decimal digits, \( q \), such that any floating-point number with \( q \) decimal digits can be rounded into a floating-point number with \( p \) radix \( b \) digits and back again, using to-nearest rounding for both roundings, without change to the \( q \) decimal digits, …

In H.3 #7, change:

— number of decimal digits, \( n \), such that any floating-point number with \( p \) bits can be rounded to a floating-point number with \( n \) decimal digits and back again, using to-nearest rounding for both roundings, without change to the value, …

In H.3 #7, change:

— number of decimal digits, \( q \), such that any floating-point number with \( q \) decimal digits can be rounded to a floating-point number with \( p \) bits and back again, using to-nearest rounding for both roundings, without a change to the \( q \) decimal digits, …