

Digit Separators

Chapter 1 Safe Features

will support for a particular floating-point type and value. Note, however, that because the compiler is not required to use the floating-point arithmetic of the target platform *during compilation*, this approach might not be applicable for a cross-compilation scenario.

One final useful tidbit pertains to the safe, i.e., lossless, conversion between binary and decimal floating-point representations; note that “Single” in the extract below corresponds to a single-precision IEEE-754-conforming (32-bit) **float**⁷:

If a decimal string with at most 6 sig. dec. is converted to Single and then converted back to the same number of sig. dec., then the final string should match the original. Also, ...

If a Single Precision floating-point number is converted to a decimal string with at least 9 sig. dec. and then converted back to Single, then the final number must match the original.

The ranges corresponding to 6–9 for a single-precision, i.e., 32-bit, **float** described in the extract above, when applied to a double-precision, i.e., 64-bit, **double** and a quad-precision, i.e., ~~128~~-bit, **long double**, are 15–17 and ~~33–36~~, respectively.

⁷kahan97, section “Representable Numbers,” p. 4