21.3 C99 Library Changes

Some of the biggest changes in C99 affect the standard library. These changes fall into three groups:

- *Additional headers.* The C99 standard library has nine headers that don't exist in C89. Three of these (`<iso646.h>`, `<wchar.h>`, and `<wctype.h>`) were actually added to C in 1995 when the C89 standard was amended. The other six (`<complex.h>`, `<fenv.h>`, `<inttypes.h>`, `<stdbool.h>`, `<stdint.h>`, and `<tgmath.h>`) are new in C99.
- *Additional macros and functions.* The C99 standard adds macros and functions to several existing headers, primarily `<float.h>`, `<math.h>`, and `<stdio.h>`. The additions to the `<math.h>` header are so extensive that they're covered in a separate section (Section 23.4).
- *Enhanced versions of existing functions.* Some existing functions, including `printf` and `scanf`, have additional capabilities in C99.

We'll now take a quick look at the nine additional headers in the C99 standard library, just as we did in Section 21.2 for the headers in the C89 library.

`<complex.h>` *Complex Arithmetic*

<complex.h> header ➤27.4

Defines the `complex` and `I` macros, which are useful when working with complex numbers. Also provides functions for performing mathematical operations on complex numbers.

`<fenv.h>` *Floating-Point Environment*

<fenv.h> header ➤27.6

Provides access to floating-point status flags and control modes. For example, a program might test a flag to see if overflow occurred during a floating-point operation or set a control mode to specify how rounding should be done.

`<inttypes.h>` *Format Conversion of Integer Types*

<inttypes.h> header ➤27.2

Defines macros that can be used in format strings for input/output of the integer types declared in `<stdint.h>`. Also provides functions for working with greatest-width integers.

`<iso646.h>` *Alternative Spellings*

<iso646.h> header ➤25.3

Defines macros that represent certain operators (the ones containing the characters &, |, ~, !, and ^). These macros are useful for writing programs in an environment where these characters might not be part of the local character set.