The figure includes the mktime function, which the C standard classifies as a "manipulation" function rather than a "conversion" function.

gmtime
localtime
Q&A

The gmtime and localtime functions are similar. When passed a pointer to a calendar time, both return a pointer to a structure containing the equivalent broken-down time. localtime produces a local time, while gmtime's return value is expressed in UTC (Coordinated Universal Time). The return value of gmtime and localtime points to a statically allocated structure that may be changed by a later call of either function.

asctime

The asctime (ASCII time) function returns a pointer to a null-terminated string of the form

```
Sun Jun  3 17:48:34 2007\n
```

constructed from the broken-down time pointed to by its argument.

ctime

The ctime function returns a pointer to a string describing a local time. If cur_time is a variable of type time_t, the call

```
ctime(&cur_time)
```

is equivalent to

```
asctime(localtime(&cur_time))
```

The return value of asctime and ctime points to a statically allocated string that may be changed by a later call of either function.

strftime

sprintf function ➤22.8

The strftime function, like the asctime function, converts a broken-down time to string form. Unlike asctime, however, it gives us a great deal of control over how the time is formatted. In fact, strftime resembles sprintf in that it writes characters into a string s (the first argument) according to a format string (the third argument). The format string may contain ordinary characters (which are copied into s unchanged) along with the conversion specifiers shown in Table 26.2 (which are replaced by the indicated strings). The last argument points to a tm structure, which is used as the source of date and time information. The second argument is a limit on the number of characters that can be stored in s.

locales ➤25.1

The strftime function, unlike the other functions in <time.h>, is sensitive to the current locale. Changing the LC_TIME category may affect the behavior of the conversion specifiers. The examples in Table 26.2 are strictly for the "C" locale; in a German locale, the replacement for %A might be Dienstag instead of Tuesday.

C99

The C99 standard spells out the exact replacement strings for some of the conversion specifiers in the "C" locale. (C89 didn't go into this level of detail.) Table 26.3 lists these conversion specifiers and the strings they're replaced by.

C99

C99 also adds a number of strftime conversion specifiers, as Table 26.2 shows. One of the reasons for the additional conversion specifiers is the desire to support the ISO 8601 standard.