## *ISO 8601*

ISO 8601 is an international standard that describes ways of representing dates and times. It was originally published in 1988 and later updated in 2000 and 2004. According to this standard, dates and times are entirely numeric (i.e., months are not represented by names) and hours are expressed using the 24-hour clock.

There are a number of ISO 8601 date and time formats, some of which are directly supported by `strftime` conversion specifiers in C99. The primary ISO 8601 date format (*YYYY–MM–DD*) and the primary time format (*hh:mm:ss*) correspond to the `%F` and `%T` conversion specifiers, respectively.

ISO 8601 has a system of numbering the weeks of a year; this system is supported by the `%g`, `%G`, and `%V` conversion specifiers. Weeks begin on Monday, and week 1 is the week containing the first Thursday of the year. Consequently, the first few days of January (as many as three) may belong to the last week of the previous year. For example, consider the calendar for January 2011:

**January 2011**

| *Mo* | *Tu* | *We* | *Th* | *Fr* | *Sa* | *Su* |
|---|---|---|---|---|---|---|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |

| *Year* | *Week* |
|---|---|
| 2010 | 52 |
| 2011 | 1 |
| 2011 | 2 |
| 2011 | 3 |
| 2011 | 4 |
| 2011 | 5 |

January 6 is the first Thursday of the year, so the week of January 3–9 is week 1. January 1 and January 2 belong to the last week (week 52) of the previous year. For these two dates, `strftime` will replace `%g` by `10`, `%G` by `2010`, and `%V` by `52`. Note that the last few days of December will sometimes belong to week 1 of the following year; this happens whenever December 29, 30, or 31 is a Monday.

The `%z` conversion specifier corresponds to the ISO 8601 time zone specification: *–hhmm* means that a time zone is *hh* hours and *mm* minutes behind UTC; the string *+hhmm* indicates the amount by which a time zone is ahead of UTC.

C99

C99 allows the use of an `E` or `O` character to modify the meaning of certain `strftime` conversion specifiers. Conversion specifiers that begin with an `E` or `O` modifier cause a replacement to be performed using an alternative format that depends on the current locale. If an alternative representation doesn't exist in the current locale, the modifier has no effect. (In the `"C"` locale, `E` and `O` are ignored.) Table 26.4 lists all conversion specifiers that are allowed to have `E` or `O` modifiers.

PROGRAM

## Displaying the Date and Time

Let's say we need a program that displays the current date and time. The program's first step, of course, is to call the `time` function to obtain the calendar time. The