***Q: Is there a relationship between the `abort` function and `SIGABRT` signal? [p. 688]**

A: Yes. A call of `abort` actually raises the `SIGABRT` signal. If there's no handler for `SIGABRT`, the program terminates abnormally as described in Section 26.2. If a handler has been installed for `SIGABRT` (by a call of the `signal` function), the handler is called. If the handler returns, the program then terminates abnormally. However, if the handler *doesn't* return (it calls `longjmp`, for example), then the program doesn't terminate.

`signal` function ➤24.3

`longjmp` function ➤24.4

Q: Why do the `div` and `ldiv` functions exist? Can't we just use the / and % operators? [p. 692]

A: `div` and `ldiv` aren't quite the same as / and %. Recall from Section 4.1 that applying / and % to negative operands doesn't give a portable result in C89. If `i` or `j` is negative, whether the value of `i / j` is rounded up or down is implementation-defined, as is the sign of `i % j`. The answers computed by `div` and `ldiv`, on the other hand, don't depend on the implementation. The quotient is rounded toward zero; the remainder is computed according to the formula $n = q \times d + r$, where n is the original number, q is the quotient, d is the divisor, and r is the remainder. Here are a few examples:

n	d	q	r
7	3	2	1
–7	3	–2	–1
7	–3	–2	1
–7	–3	2	–1

C99 In C99, the / and % operators are guaranteed to produce the same result as `div` and `ldiv`.

Efficiency is the other reason that `div` and `ldiv` exist. Many machines have an instruction that can compute both the quotient and remainder, so calling `div` or `ldiv` may be faster than using the / and % operators separately.

Q: Where does the name of the `gmtime` function come from? [p. 696]

A: The name `gmtime` stands for Greenwich Mean Time (GMT), referring to the local (solar) time at the Royal Observatory in Greenwich, England. In 1884, GMT was adopted as an international reference time, with other time zones expressed as hours "behind GMT" or "ahead of GMT." In 1972, Coordinated Universal Time (UTC)—a system based on atomic clocks rather than solar observations—replaced GMT as the international time reference. By adding a "leap second" once every few years, UTC is kept synchronized with GMT to within 0.9 second, so for all but the most precise time measurements the two systems are identical.

Exercises

Section 26.1

1. Rewrite the `max_int` function so that, instead of passing the number of integers as the first argument, we must supply 0 as the last argument. *Hint:* `max_int` must have at least one