

5.3

Using the while Loop for Input Validation

CONCEPT: The `while` loop can be used to create input routines that repeat until acceptable data is entered.

Perhaps the most famous saying of the computer industry is “garbage in, garbage out.” The integrity of a program’s output is only as good as its input, so you should try to make sure garbage does not go into your programs. *Input validation* is the process of inspecting data given to a program by the user and determining if it is valid. A good program should give clear instructions about the kind of input that is acceptable and not assume the user has followed those instructions.

The `while` loop is especially useful for validating input. If an invalid value is entered, a loop can require that the user reenter it as many times as necessary. For example, the following loop asks for a number in the range of 1 through 100:

```
cout << "Enter a number in the range 1-100: ";
cin >> number;
while (number < 1 || number > 100)
{
    cout << "ERROR: Enter a value in the range 1-100: ";
    cin >> number;
}
```

This code first allows the user to enter a number. This takes place just before the loop. If the input is valid, the loop will not execute. If the input is invalid, however, the loop will display an error message and require the user to enter another number. The loop will continue to execute until the user enters a valid number. The general logic of performing input validation is shown in Figure 5-4.

Figure 5-4

