Chapter 5. LOOPS AND RELATIONAL EXPRESSIONS

In this chapter you learn

- Introducing the \texttt{for} Loop
- Relational Expressions
- The \texttt{while} Loop
- The \texttt{do while} Loop
- Loops and Text Input
- Nested Loops and Two-Dimensional Arrays
- Summary
- Review Questions
- Programming Exercises

Computers do more than store data. They analyze, consolidate, rearrange, extract, modify, extrapolate, synthesize, and otherwise manipulate data. Sometimes they even distort and trash data, but we'll try to steer clear of that kind of behavior. To perform their manipulative miracles, programs need tools for performing repetitive actions and for making decisions. C++, of course, provides such tools. Indeed, it uses the same \texttt{for} loops, \texttt{while} loops, \texttt{do while} loops, \texttt{if} statements, and \texttt{switch} statements that regular C employs, so if you know C, you can zip through this and the next chapter. (But don't zip too fast—you don't want to miss how \texttt{cin} handles character input!) These various program control statements often use relational expressions and logical expressions to govern their behavior. This chapter discusses loops and relational expressions, and the next chapter follows up with branching statements and logical expressions.

\textbf{Introducing the \texttt{for} Loop}

Circumstances often call upon a program to perform repetitive tasks, such as adding together the elements of an array one by one or printing some paean to productivity twenty times. The C++ \texttt{for} loop makes such tasks easy to do. Let's look at a loop in \texttt{Listing 5.1}, see what it does, and then discuss how it works.