**Programs and Programming**

What exactly is programming? Many people think of it as simply typing words into a computer. That may be part of it, but that is certainly not all of it. Programming is actually a *problem-solving procedure.*

**What Is a Program?**

To see how programming works, think about what a program is. A **program** is a list of instructions for the computer to follow to accomplish the task of processing data into information. The instructions are made up of statements used in a programming language, such as BASIC, C, or Java.

You are already familiar with some types of programs. As we discussed earlier, application programs are widely used to accomplish a variety of different types of tasks. For example, we use word processors to create documents and spreadsheets to analyze data. System programs, on the other hand, focus on tasks necessary to keep the computer running smoothly. These can be purchased and are referred to as prewritten or packaged programs. Programs also can be created or custom-made. Will off-the-shelf software do the job, or should it be custom written? This is one of the first things that needs to be decided in programming.

**What Is Programming?**

A program is a list of instructions for the computer to follow to process data. **Programming,** also known as **software development,** is a six-step procedure for creating that list of instructions. Only one of those steps consists of typing (keying) statements into a computer. The six steps are as follows:

**1.** *Program specification:* The program’s objectives, outputs, inputs, and processing requirements are determined.

**2.** *Program design:* A solution is created using programming techniques such as top-down program design, pseudocode, flowcharts, and logic structures.

**3.** *Program code:* The program is written or coded using a programming language.

**4.** *Program test:* The program is tested or debugged by looking for syntax and logic errors.

**5.** *Program documentation:* Documentation is an ongoing process throughout the programming process. This phase focuses on formalizing the written description and processes used in the program.

**6.** *Program maintenance:* Completed programs are periodically reviewed to evaluate their accuracy, efficiency, standardization, and ease of use. Changes are made to the program’s code as needed.

In organizations, computer professionals known as **software engineers** or **programmers** use this six-step procedure. Working closely with systems analysts in systems development, Phase 4 of the systems life cycle, programmers create software required for information systems. In a recent survey by *Money* magazine, software engineers were ranked near the top of over 100 widely held jobs based on salary, prestige, and security. You may well find yourself working directly with a programmer or indirectly through a systems analyst. Or you may actually do the programming for a system that you develop. Whatever the case, it’s important that you understand the six-step programming procedure.

**CONCEPT CHECK**

1. What is a program?

2. What are the six programming steps?