



# Introduction to Computers, the Internet and the Web

## OBJECTIVES

In this chapter you will learn:

- Basic computer hardware and software concepts.
- Basic object technology concepts, such as classes, objects, attributes, behaviors, encapsulation, inheritance and polymorphism.
- The different types of programming languages.
- Which programming languages are most widely used.
- A typical Java program development environment.
- Java's role in developing distributed client/server applications for the Internet and the web.
- The history of UML—the industry-standard object-oriented design language, the UML.
- The history of the Internet and the World Wide Web.
- To test-drive Java applications.

## Student Solution Exercises

**1.4** Categorize each of the following items as either hardware or software:

a) CPU

**ANS:** hardware.

b) Java compiler

**ANS:** software.

c) JVM

**ANS:** software.

d) input unit

**ANS:** hardware.

e) editor

**ANS:** software.

**1.6** What is the difference between fatal errors and nonfatal errors? Why might you prefer to experience a fatal error rather than a nonfatal error?

**ANS:** Fatal runtime errors cause program to terminate immediately without having successfully performed their jobs. Nonfatal runtime errors allow programs to run to completion, often producing incorrect results. Fatal errors may be preferable, because they are obvious and easy to find.

**1.8** Fill in the blanks in each of the following statements (based on Section 1.13):

a) Java programs normally go through five phases—\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

**ANS:** edit, compile, load, verify, execute.

b) A(n) \_\_\_\_\_ provides many tools that support the software development process, such as editors for writing and editing programs, debuggers for locating logic errors in programs, and many other features.

**ANS:** integrated development environment (IDE).

c) The command java invokes the \_\_\_\_\_, which executes Java programs.

**ANS:** Java Virtual Machine (JVM).

d) A(n) \_\_\_\_\_ is a software application that simulates a computer, but hides the underlying operating system and hardware from the programs that interact with the VM.

**ANS:** virtual machine (VM).

e) A(n) \_\_\_\_\_ program can run on multiple platforms.

**ANS:** portable.

f) The \_\_\_\_\_ takes the .class files containing the program's bytecodes and transfers them to primary memory.

**ANS:** class loader.

g) The \_\_\_\_\_ examines bytecodes to ensure that they are valid.

**ANS:** bytecode verifier.