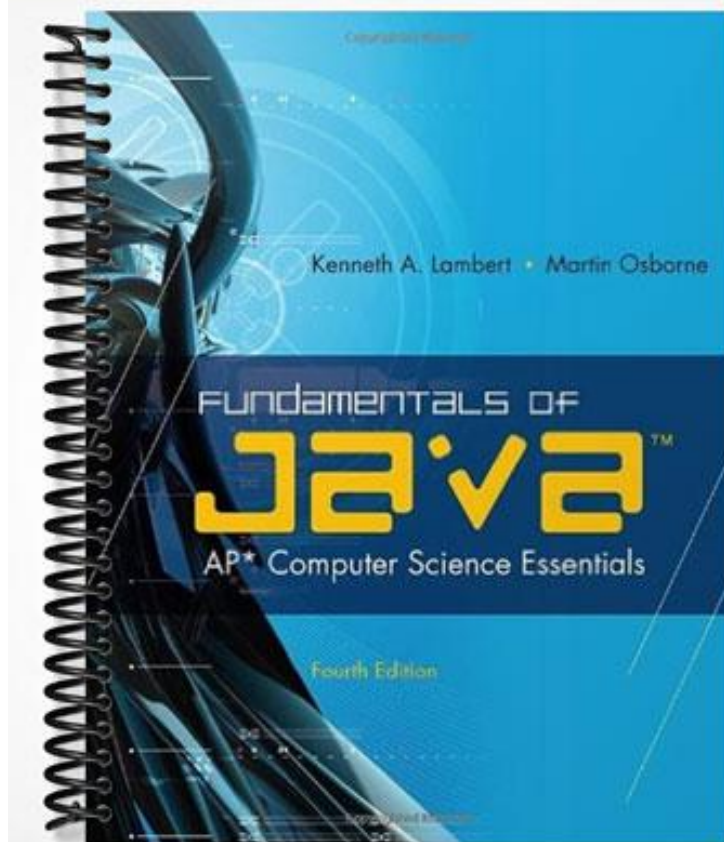


# SOLUTIONS MANUAL



## UNIT 1—GETTING STARTED WITH JAVA

### CHAPTER 2—FIRST JAVA PROGRAMS

#### EXERCISE 2.1

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1. A portable program can be written once and recompiled to run on any machine.
2. Java programs do not overwrite memory. Java also has standard features for writing network-based applications.
3. A thread is a process that can run concurrently with other processes. One program can consist of several threads. In a given program, one thread might be loading an image while another thread takes input from the user.

#### EXERCISE 2.2

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1. JVM stands for Java virtual machine.
2. Byte code is the code to which a Java source program translates during compilation. The JVM executes the byte code by interpreting its instructions.
3. An applet is a Java program that runs in a Web browser. The user launches an applet by selecting a hot spot in a Web page. The hot spot asks the Web page's server to transmit the applet's byte code to the client's Web browser. The byte code is checked for security, and then the Web browser's JVM executes the code.

#### EXERCISE 2.4

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1. A program is a sequence of instructions and data that solves a problem or accomplishes a task.
2. The message `println` causes the object to which it is sent to run the corresponding method. This method displays the message's parameter, a string or a number, on the terminal screen.
3. This name refers to an object that can be sent the message `println`.
4. Here is an example answer, which is entirely fictional:

```
System.out.println("Rosa Marquez");  
System.out.println("231 Mayberry Lane");  
System.out.println("Montvale, CA 33422");  
System.out.println("(506)-445-6677");
```

#### EXERCISE 2.5

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1. Three steps in writing and running a program are editing, compilation, and execution.

2. Compile-time errors occur while a program is being compiled. An example is the failure to include a semicolon where it is expected.
3. a. A double quote mark is missing before the right parenthesis. b. A right parenthesis is missing before the semicolon.
4. A readable program is more easily understood and modified by others and even by its original author.

## EXERCISE 2.6

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1. A variable is a name of a storage location in computer memory. Programs can store values in variables, such as numbers or references to objects, and use these values whenever they are needed. In general, a variable provides a convenient way of remembering a value that might be modified during the course of a program.
2. The assignment operator causes a value to be stored in a variable.
3. A `Scanner` object receives messages to input data from a human user. For example, when sending the message `nextDouble`, a `Scanner` object causes a program to wait for a user to enter the digits of a number. When the user presses the Enter key, the object returns the corresponding floating-point number.
4. A variable of type `double` names a storage location for a floating-point number. A variable of type `Scanner` names a storage location for a reference to a `Scanner` object.
5. `print` displays a string without a newline character, whereas `println` adds a newline character to the display. Here is an example of their use:

```
Scanner reader = new Scanner(System.in);
System.out.print("Enter your age: ");
double age = reader.nextDouble();
System.out.print("Your age is ");
System.out.println(age);
```

## EXERCISE 2.7

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1. a) white is (255, 255, 255)  
b) black is (0, 0, 0)  
c) highest intensity blue is (0, 0, 255)  
d) medium gray is (127, 127, 127)
2. The frame plays the role of the main window in an application. Its responsibilities are to display controls for resizing, zooming, minimizing, and closing the window. A panel plays the role of a rectangular area within a window on which shapes or images can be painted. A panel is responsible for setting its background color and refreshing itself when needed. A layout manager plays the role of the organizer of components within a container. Its responsibility is to influence the placement of a component in a container.

3. Panels can be displayed in any of the five regions under the influence of a border layout – labeled north, south, east, west, and center.
4. The code for setting a layout with a 5 by 5 grid would be:

```
pane.setLayout(new GridLayout(5, 5));
```

## REVIEW QUESTIONS

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### Written Questions

1. Java is safe, robust, and portable.
2. Byte code is the code produced by the Java compiler. Byte code is machine independent and is executed by a Java interpreter.
3. The JVM, or Java Virtual Machine, is a program that runs a Java program.
4. Terminal I/O objects include a `Scanner` and `System.out`.
5. The omission of a semicolon at the end of a statement and the omission of a double quote at the end of a string.
6. After a program is edited and compiled, it can be run by using the `java` command with the byte code's file name at the command line prompt.
7. A program comment is designed to give the human reader of a program extra information about the purpose or design of a particular feature of the code. This documentation can clarify or explain the programmer's intent.
8. An import statement directs the compiler to use code from a Java library or package or a user-defined library or package.

### Fill in the Blank

1. terminal-based and GUI-based
2. `println`
3. `nextInt`
4. variable
5. assignment statement
6. messages