Seventh Edition

JAVA HOW TO PROGRAM

JAVA SE 6 (Mustang) • Web Services
Ajax-Enabled Web Applications
JavaServer Faces

EARLY CLASSES/OBJECTS/OOP
- Inheritance, Polymorphism
- Interfaces, Nested Classes
- Optional GUI/Graphics Track
- OOP Case Studies, UML 2

FUNDAMENTALS
- I/O, Types, Arrays, Operators
- Methods, Control Statements
- Using API Docs, Debugger
- Scanner, Printf, Enhanced For
- Enum, Boxing, Varargs

JDK APIs
- Swing GUI, SwingWorker
- GroupLayout, Multimedia
- Exceptions, Strings, Regex
- JDBC, Graphics, Java 2D
- Sockets, Concurrency APIs

DATA STRUCTURES/DATABASE
- Recursion, Searching, Sorting
- Files/Streams, Data Structures
- Generics, Collections
- JDBC 4, RowSets, JTable
- Java DB/Apache Derby, MySQL

INTERNET/WEB APPLICATIONS
- Networking, Google Maps
- JavaServer Faces (JSF), Tools
- Ajax-Enabled Web Applications
- Web Services, Annotations
- Mashups, Web 2.0, Refactoring

OOD/UML 2 ATM CASE STUDY
- [Optional] Diagrams: Class, Activity, Use Case, Sequence, Communication, State
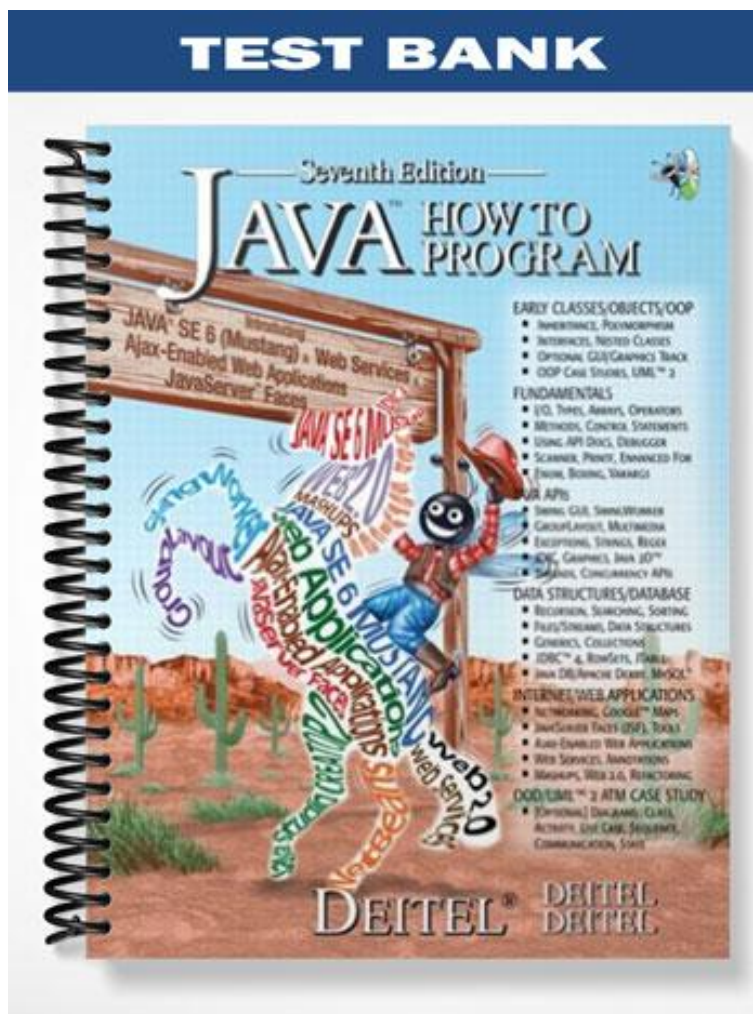
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Chapter 2 Introduction to Java Applications

Section 2.1 Introduction

(none)

Section 2.2 First Program in Java: Printing a Line of Text

2.2 Q1: End-of-line comments that should be ignored by the compiler are denoted using
a. Two forward slashes (`//`).
b. Three forward slashes (`///`).
c. A slash and a star (`/*`).
d. A slash and two starts (`/**`).
e. **ANS:** a. Two forward slashes (`//`).

2.2 Q2: Which of the following is not a valid Java identifier?
```
a.  my Value
b.  $_AAA1
c.  width
d.  m_x
```
ANS: a. `my Value` (Identifiers may not contain blanks).

2.2 Q3: Which of the following cannot cause a syntax error to be reported by the Java compiler?
a. Mismatched `{}`
b. Missing `*/` in a comment that begins with `/*`
c. Missing `;`
d. Extra blank lines.
ANS: d. Extra blank lines.

2.2 Q4: Which of the following is not a syntax error?
```
a.  System.out.println( 'Hello world!' ):
b.  System.out.println( "Hello
                         world!" );
c.  System.out.println( "Hello world!" );
d.  System.out.println( Hello world! );
```
ANS: c. System.out.println("Hello world!");

Compiling and Executing Your First Java Application

2.2 Q5: Which command compiles the Java source code file `Welcome.java`?
```
a.  cd Welcome.java
b.  javac Welcome.java
c.  java Welcome.java
```

```
d. compile Welcome.java
```
ANS: b. `javac Welcome.java`

2.2 Q6: Which command executes the Java class file `Welcome.class`?
```
a.  javac Welcome.class
b.  java Welcome.class
c.  java Welcome
d.  run Welcome.class
```
ANS: c. `java Welcome`

Section 2.3 Modifying Our First Java Program

Displaying a Single Line of Text with Multiple Statements

2.3 Q1: Which is the output of the following statements?
```
    System.out.print( "Hello ");
    System.out.println( "World" );
a.  Hello World
b.  HelloWorld
c.  Hello
    World
d.  World
    Hello
```
ANS: a. Hello World

Displaying Multiple Lines of Text with a Single Statement

2.3 Q2: Which of the following characters is the escape character?
```
a.  *
b.  \
c.  \n
d.  "
```
ANS: b. \

2.3 Q3: Which of the following statements will print a single line containing `"hello there"`?
```
a.  System.out.println( "hello" );
    System.out.println( " there" );
b.  System.out.println( "hello" ,  " there" );
c.  System.out.println( "hello" );
    System.out.print( " there" );
d.  System.out.print( "hello" );
    System.out.println( " there" );
```
ANS: d. `System.out.print( "hello" );`
`        System.out.println( " there" );`

2.3 Q4: Which of the following escape sequences represents carriage return?
```
e.  \n.

f.  \r.

g.  \cr.
```

```
h. \c.
```
ANS: b. `\r.`

2.3 Q4: Which of the following statements would display the phase `Java is fun`?
```
a. System.out.println( "hellois fun\rJava " );
b. System.out.println( 'Java is fun' );
c. System.out.println( "\"Java is fun\"" );
d. System.out.println( Java is fun );
```
ANS: a. `System.out.println( "hellois fun\rJava " );`

Section 2.4 Displaying Text with `printf`

2.4 Q1: When method `printf` requires multiple arguments, the arguments are separated with _____.
a. colons (:).
b. semicolons (;).
c. commas (,).
d. periods (.).
ANS: c. commas (,).

2.4 Q2: Which of the following statement displays `Hello World`?
```
a. System.out.printf( "%2s", "Hello " "World" );
b. System.out.printf( "%s %s", "Hello", "World" );
c. System.out.printf( "%s%s", "Hello, World" );
d. System.out.printf( "s% s%", "Hello", "World" );
```
ANS: b. `System.out.printf( "%s %s", "Hello", "World" );`

Section 2.5 Another Java Application: Adding Integers

2.5 Q1: All `import` declarations must be placed
a. inside the class declaration's body.
b. before the class declaration.
c. after the class declaration.
d. all of the above will work.
ANS: b. before the class declaration.

2.5 Q2: Which of the following is a variable declaration statement?
```
a. int total;
b. import java.util.Scanner;
c. public static void main( String args[] )
d. // first string entered by user
```
ANS: a. `int total;`

2.5 Q3: A(n) _____ enables a program to read data from the user.

a. `printf`.
b. `import` declaration.
c. `Scanner`.
d. `main`.
ANS: c. `Scanner`.

2.5 Q4: Which of the following is not a Java primitive type?
```
a. char
b. byte
c. real
d. double
```
ANS: c. `real`

2.5 Q5: The format specifier _____ is a place-holder for an `int` value?
a. `%a`.
b. `%d`.
c. `%int`.
d. `%s`.
ANS: b. `%d`.

Java API Documentation

(none)

Section 2.6 Memory Concepts

2.6 Q1: Which of the following statements does not alter a memory location?
```
a. int a;
b. number = 12;
c. y = y + 2;
d. width = Integer.parseInt(input);
```
ANS: a. `int a;`

Section 2.7 Arithmetic

2.7 Q1: What is the value of `result` after the following Java statements execute?
```
     int a, b, c, d, result;
     a = 4;
     b = 12;
     c = 37;
     d = 51;
     result = d % a * c + a % b + a;
```
a. 119
b. 51
c. 127

```
d.  59
```
ANS: a. 119

2.7 Q2: List the following operators in the order that they will be evaluated: `-`, `*`, `/`, `+`, `%`. Assume that if two operations have the same precedence, the one listed first will be evaluated first.
```
a.  +, -, /, *, %.
b.  -, +, %, *, /.
c.  -, *, %, +, /.
d.  *, /, %, -, +.
```
ANS: d. *, /, %, -, +.

2.7 Q3: Which of the following is not an arithmetic operator?
```
a.  +
b.  -
c.  .
d.  %
```
ANS: c. .

Section 2.8 Decision Making: Equality and Relational Operators

2.8 Q1: What will be output after the following Java statements have been executed?
```
    int a, b, c, d;
    a = 4;
    b = 12;
    c = 37;
    d = 51;

    if ( a < b )
       System.out.println( "a < b" );

    if ( a > b )
       System.out.println( "a > b" );

    if ( d <= c )
       System.out.println( "d <= c" );

    if ( c != d )
       System.out.println( "c != d" );
```
```
a.  a < b
    c != d
b.  a < b
    d <= c
    c != d
c.  a > b
    c != d
d.  a < b
    c < d
    a != b
```
ANS: a. `a < b`

```
    c != d
```

2.8 Q2: Which of the following is not a syntax error?
a. Neglecting to initialize a local variable in a method before it is used.
b. Using a single equals sign instead of a double equals sign in the condition of an `if` statement.
c. Placing a semicolon at the end of the first line of an `if` statement.
d. Omitting the left and right parenthesis for the condition of an `if` statement.
ANS: c. Placing a semicolon at the end of the first line of an `if` statement.

2.8 Q3: Each of the following is a relational or equality operator except:
a. `<=`
b. `=!`
c. `==`
d. `>`
ANS: b. `=!`

Section 2.9 (Optional) Software Engineering Case Study: Examining the Requirements Document

Requirements Document

(none)

Analyzing the ATM System

2.9 Q1: Which of the following is the first stage of the software life cycle?
a. design.
b. implementation.
c. requirements gathering.
d. analysis.
ANS: c. requirements gathering.

Use Case Diagrams

2.9 Q2: The use case diagram models _____.
a. the interactions between a system's client and its use case.
b. each software life cycle stage in succession.
c. each software life cycle by repeating one or more stages several times via use cases.
d. the interactions between implementations and testing.
ANS: a. the interactions between a system's client and its use case.

2.9 Q3: Which of the following is not an actor of the ATM system?
a. A user who views an account balance.
b. A user who provides requirements for building the ATM system.

Designing the ATM System

2.9 Q4: Which diagram models system structure?
a.   State machine diagram.
b.   Class diagram.
c.   Activity diagram.
d.   Sequence diagram.
ANS: b. Class diagram.

2.9 Q4: Which diagram is also called a collaboration diagram.
a.   State machine diagram.
b.   Communication diagram.
c.   Activity diagram.
d.   Sequence diagram.
ANS: b. Communication diagram.