

Chapter 5 Control Statements: Part 2

Section 5.2 Essentials of Counter-Controlled Repetition

5.2 Q1: Counter-controlled repetition requires

- a. A control variable and initial value.
- b. A control variable increment (or decrement).
- c. A condition that tests for the final value of the control variable.
- d. All of the above.

ANS: d. All of the above.

5.2 Q2: The control variable of a counter-controlled loop should be declared as _____ to prevent errors.

- a. **int.**
- b. float.
- c. double.
- d. Any of the above.

ANS: a. int.

Section 5.3 for Repetition Statement

5.3 Q1: Consider the following two Java code segments:

Segment 1

```
int i = 0;

while (i < 20)
{
    i++;
    System.out.println(i);
}
```

Segment 2

```
for (int i = 0; i <= 20; i++)
{
    System.out.println(i);
}
```

Which of the following statements are true?

- a. The output from these segments is not the same.
- b. The scope of the control variable **i** is different for the two segments.
- c. Both (a) and (b) are true.
- d. Neither (a) nor (b) is true.

ANS: c. Both (a) and (b) are true.

5.3 Q2: Consider the classes below:

```
public class TestA
{
    public static void main(String args[])
    {
        int x = 2;
        int y = 20
        int counter = 0;

        for (int j = y % x; j < 100; j += (y / x))
            counter++;
    }
}

public class TestB
```

```

{
    public static void main(String args[])
    {
        int counter = 0;

        for (int j = 10; j > 0; --j)
            ++counter;
    }
}

```

Which of the following statements is *true*?

- The value of **counter** will be different at the end of each **for** loop for each class.
- The value of **j** will be the same for each loop for all iterations
- Both (a) and (b) are true.
- Neither (a) nor (b) is true.

ANS: d. Neither (a) nor (b) is true.

Section 5.4 Examples Using the for Statement

5.4 Q1: Which of the following **for**-loop headers results in equivalent numbers of iterations:

- for** (int q = 1; q <= 100; q++)
- for** (int q = 100; q >= 0; q--)
- for** (int q = 99; q > 0; q -= 9)
- for** (int q = 990; q > 0; q -= 90)

- A and B.
- C and D.
- A and B have equivalent iterations and C and D have equivalent iterations.
- None of the loops have equivalent iterations.

ANS: b. C and D.

5.4 Q2: Which of the following will count down from 10 to 1 correctly?

- for** (int j = 10; j <= 1; j++)
- for** (int j = 1; j <= 10; j++)
- for** (int j = 10; j > 1; j--)
- for** (int j = 10; j >= 1; j--)

ANS: d. for (int j = 10; j >= 1; j--)

Application: Summing the Even Integers from 2 to 20

5.4 Q3: Which of the following is equivalent to this code segment?

```

int total = 0;

for (int i = 0; i <= 20; i += 2)
    total += i;

```

- int total = 0;
for (int i = 20; i < 0; i += 1)
total += i;
- int total = 0;
for (int i = 0; i <= 20; total += i, i += 2);

```
c. int total = 0;
   for (int i = 0, i <= 20, total += i; i += 2);
d. int total = 0;
   for (int i = 2; i < 20; total += i, i += 2);
ANS: b. int total = 0;
   for (int i = 0; i <= 20; total += i, i += 2)
```

Application: Compound Interest Calculations

5.4 Q4: Which statement prints the floating-point value 123.456 right justified with a field width of 10?

- a. `System.out.printf("%d10.3", 123.456);`
 - b. `System.out.printf("%10.3d", 123.456);`
 - c. `System.out.printf("%f10.3", 123.456);`
 - d. `System.out.printf("%10.3f", 123.456);`
- ANS: d. `System.out.printf("%10.3f", 123.456);`

5.4 Q5: Which formatting flag indicates that the floating-point values should be output with a thousands separator?

- a. plus (+).
 - b. minus (-).
 - c. comma (,).
 - d. period (.).
- ANS: c. comma (,).

Section 5.5 do...while Repetition Statement

5.5 Q1: Which of the following statements about a **do...while** repetition statement is *true*?

- a. The body of a **do...while** loop is executed only if the terminating condition is *true*.
- b. The body of a **do...while** loop is executed only once.
- c. The body of a **do...while** loop is always executed at least once.
- d. None of the above.

ANS: c. The body of a **do...while** loop is always executed at least once.

5.5 Q2: Which of the following will *not* help prevent infinite loops?

- a. Include braces around the statements in a **do...while** statement.
- b. Ensure that the header of a **for** or **while** statement is *not* followed by a semicolon.
- c. If the loop is counter-controlled, the body of the loop should increment or decrement the counter as needed.
- d. If the loop is sentinel-controlled, ensure that the sentinel value is input eventually.

ANS: a. Include braces around the statements in a **do...while** statement.

Section 5.6 switch Multiple-Selection Statement

Using a switch Statement to Count A, B, C, D and F Grades

5.6 Q1: For the two code segments below:

Segment A

```

int q = 5;
switch(q)
{
    case 1:
        System.out.println(1);
    case 2:
        System.out.println(2);
    case 3:
        System.out.println(3);
    case 4:
        System.out.println(4);
    case 5:
        System.out.println(5);
    default:
        System.out.println("default");
}

```

Segment B

```

q = 4;
switch(q)
{
    case 1:
        System.out.println(1);
    case 2:
        System.out.println(2);
    case 3:
        System.out.println(3);
    case 4:
        System.out.println(4);
    case 5:
        System.out.println(5);
    default:
        System.out.println("default");
}

```

Which of the following statements is *true*?

- a. The output for Segment A is:
default
- b. The output for Segment B is:
4
- c. The output for Segment B is:
45default
- d. The output for Segment A is:
5
default

ANS: d. The output for Segment A is:

5
default

5.6 Q2: For the code segment below:

```

switch(q)
{
    case 1:
        System.out.println("apple");
        break;
    case 2:
        System.out.println("orange");
        break;
}

```

```

        case 3:
            System.out.println("banana");
            break;
        case 4:
            System.out.println("pear");
        case 5:
            System.out.println("grapes");
        default:
            System.out.println("kiwi");
    }

```

Which of the following values for **q** will result in **kiwi** being included in the output?

- a. 2.
- b. Any integer less than 1 and greater than or equal to 4.
- c. 1.
- d. 3.

ANS: b. Any integer less than 1 and greater than or equal to 4.

switch Statement UML Activity Diagram

5.6 Q3: Which of the following can be used in a switch statement in the expression after keyword **case**?

- A. a constant integral expression.
 - B. a character constant.
 - C. a String
 - D. an enumeration constant.
- a. A and B.
 - b. A and C.
 - c. B and C.
 - d. All.

ANS: d. All.

Using Strings in switch Statements

5.6 Q4: Which of the following statements about the switch statement is *false*?

- a. You can use Strings in a switch statement's controlling expression.
- b. You can use a String in a switch statement's case label.
- c. You can use a comma-separated list of Strings in a switch statement's case label.
- d. You cannot use a String in a switch statement's default case label.

ANS: c. You can use a comma-separated list of Strings in a switch statement's case label.

Section 5.7 Class AutoPolicy Case Study: Strings in switch Statements

5.7 Q1: Which of the following statements is *true*?

- a. Strings can be used in a switch statement's controlling expression and in its case labels.
- b. Strings can be used in a switch statement's controlling expression but not in its case labels.
- c. Strings cannot be used in a switch statement's controlling expression but can be used in its case labels.
- d. Strings cannot be used in a switch statement's controlling expression and cannot be used in its case labels.

ANS: a. Strings can be used in a switch statement's controlling expression and in its case labels.

Section 5.8 break and continue Statements

break Statement

5.8 Q1: Which of the following statements about the **break** statement is *false*?

- a. The **break** statement is used to exit a repetition structure early and continue execution after the loop.
- b. A **break** statement can only break out of an immediately enclosing **while**, **for**, **do...while** or **switch** statement.
- c. The **break** statement, when executed in a **while**, **for** or **do...while**, skips the remaining statements in the loop body and proceeds with the next iteration of the loop.
- d. Common uses of the **break** statement are to escape early from a loop or to skip the remainder of a **switch**.

ANS: c. The break statement, when executed in a while, for or do...while, skips the remaining statements in the loop body and proceeds with the next iteration of the loop.

continue Statement

5.8 Q2: Which of the following statements about the **continue** statement is *true*?

- a. The **continue** statement is used to exit a repetition structure early and continue execution after the loop.
- b. The **continue** statement is used to continue after a **switch** statement.
- c. The **continue** statement does not alter the flow of control.
- d. A **continue** statement proceeds with the next iteration of the immediately enclosing **while**, **for**, **do...while** statement.

ANS: d. A continue statement proceeds with the next iteration of the immediately enclosing while, for, do...while statement.

5.8 Q3: To exit out of a loop completely, and resume the flow of control at the next statement after the loop, use a _____.

- a. **continue** statement.
- b. **break** statement.
- c. **return** statement.
- d. Any of the above.

ANS: b. break statement.

Section 5.9 Logical Operators

5.9 Q1: Consider the code segment below.

```
if (gender == 1)
{
    if (age >= 65)
        ++seniorFemales;
}
```

This segment is equivalent to which of the following?

- a. `if (gender == 1 || age >= 65) ++seniorFemales;`
- b. `if (gender == 1 && age >= 65) ++seniorFemales;`

c. `if (gender == 1 AND age >= 65)`
 `++seniorFemales;`
d. `if (gender == 1 OR age >= 65)`
 `++seniorFemales;`
ANS: b. `if (gender == 1 && age >= 65)`
 `++seniorFemales;`

Short-Circuit Evaluation of Complex Conditions

5.9 Q2: Suppose variable `gender` contains `MALE` and `age` equals 60, how is the expression `(gender == FEMALE) && (age >= 65)` evaluated?

- a. The condition `(gender == FEMALE)` is evaluated first and the evaluation stops immediately.
- b. The condition `(age >= 65)` is evaluated first and the evaluation stops immediately.
- c. Both conditions are evaluated, from left to right.
- d. Both conditions are evaluated, from right to left.

ANS: a. The condition `(gender == FEMALE)` is evaluated first and the evaluation stops immediately.

Boolean Logical AND (&) and Boolean Logical OR (|) Operators

5.9 Q3: Which case of the following would warrant using the boolean logical inclusive OR (`|`) rather than the conditional OR (`||`)?

- a. Testing if two conditions are both true.
- b. Testing if at least one of two conditions is true.
- c. Testing if at least one of two conditions is true when the right operand has a required side effect.
- d. Testing if at least one of two conditions is true when the left operand has a required side effect.

ANS: c. Testing if at least one of two conditions is true when the right operand has a required side effect.

Logical Negation (!) Operator

5.9 Q4: Which expression is equivalent to `if (!(grade == sentinelValue))`?

- a. `if (grade != sentinelValue)`
- b. `if (grade != sentinelValue)`
- c. `! if (grade == sentinelValue)`
- d. `! if (grade != sentinelValue)`

ANS: b. `if (grade != sentinelValue)`

Logical Operators Example

5.9 Q5: boolean values can be displayed as the words `true` and `false` with the _____ format specifier.

- a. `%bool.`
- b. `%b.`
- c. `%true.`
- d. `%boolean.`

ANS: b. `%b.`

Section 5.10 Structured Programming Summary

5.10 Q1: Which statement below is *false*?

- a. Structured programming produces programs that are easier to test.
- b. Structured programming requires four forms of control.
- c. Structured programming produces programs that are easier to modify
- d. Structured programming promotes simplicity.

ANS: b. Structured programming requires four forms of control. (Only three forms are necessary: sequence, selection, repetition)

5.10 Q2: Which of the following is *not* a type of repetition statement in Java?

- a. while statement.
- b. do...while statement.
- c. for statement.
- d. loop statement.

ANS: d. loop statement.

Section 5.11 (Optional) GUI and Graphics Case Study: Drawing Rectangles and Ovals

5.11 Q1: Method `drawOval`'s arguments specify _____.

- a. the upper-left and upper-right corners of the oval.
- b. the upper-left corner, scale and size of the oval.
- c. the position and size of the bounding rectangle for the oval.
- d. the position and size of the bounding cycle for the oval.

ANS: c. the position and size of the bounding rectangle for the oval.

5.11 Q2: The first statement in every `paintComponent` method should be a call to _____.

- a. `super`
- b. `super.paintComponent`
- c. `clear`
- d. `update`

ANS: b. `super.paintComponent`