

Solutions to Quick Check Questions

6

Selection Statements

6.1 The if Statement



Quick Check

1. Identify the invalid if statements:

a. if (a < b) then
 x = y;
 else
 x = z;

c. if (a < b)
 x = y;
 else {
 x = z;
 };

b. if (a < b)
 else x = y;

d. if (a < b) {
 x = y; } else
 x = z;

a. Invalid. The word then is not a reserved word in Java.

b. Invalid. No statement is the then part. If you place the braces as

```
if ( a < b ) { }  
else x = y;
```

then it is valid.

c. Valid. Semicolon after the right brace is never necessary, but this statement actually compiles without generating any error message.

d. Valid.

2. Express the following if-then statements using if-then-else.

a. `if (a < b) x = y;`

b. `if (a < b) { }`

c. `if (a < b) x = y;`
 `if (a >= b) x = z;`

The following answers assume the style recommend in the text, that is, to use the left and right braces independent of the number of statements inside the then or else part.

a. `if (a < b) {`
 `x = y;`
 `}`
 `else {`
 `}`

b. `if (a < b) {`
 `}`
 `else {`
 `}`

c. `if (a < b) {`
 `x = y;`
 `}`
 `else {`
 `x = z;`
 `}`

6.2 Boolean Expressions and Variables



Quick Check

1. Evaluate the following boolean expressions. Assume x , y , and z have some numerical values.

- a. $4 < 5 \ || \ 6 == 6$
- b. $2 < 4 \ \&\& \ (\text{false} \ || \ 5 <= 4)$
- c. $x <= y \ \&\& \ !(z != z) \ || \ x > y$
- d. $x < y \ || \ z < y \ \&\& \ y <= z$

a. *true*

b. *false*

c. *true*. The expression $!(z != z)$ is always true. If $x <= y$ then the $x <= y \ \&\& \ !(z != z)$ is true so the whole expression is true. If $x > y$, then the whole expression is also true.

d. *result of $x < y$* . The expression $z < y \ \&\& \ y <= z$ is always false so the whole expression is true if $x < y$ is true and false if $x < y$ is false.

2. Identify errors in the following boolean expressions and assignments.

- a.

```
boolean done;  
done = x = y;
```
- b.

```
2 < 4 && (3 < 5) + 1 == 3
```
- c.

```
boolean quit;  
quit = true;  
quit == ( 34 == 20 ) && quit;
```

a. *Assuming that x and y are some numerical data type, the second statement should be*

```
done = x == y;
```

b. *The result of $(3 < 5)$ is a boolean value so adding 1 to it is invalid.*

c. The third statement should be

```
quit = ( 34 == 20 ) && quit;
```

6.3 Nested-if Statements



Quick Check

1. Rewrite the following nested-if statements without using any nesting:

<p>a.</p> <pre> if (a < c) if (b < c) x = y; else x = z; else x = z;</pre>	<p>c.</p> <pre> if (a < b) if (a >= b) x = z; else x = y; else x = z;</pre>
<p>b.</p> <pre> if (a == b) x = y; else if (a > b) x = y; else x = z;</pre>	

Answers:

```

.      a.      if ( a < c && b < c )
                x = y;
            else
                x = z;

        b.      if ( a == b )
                x = y;
            else
                x = z;

        c.      if ( a < b )
                x = y;
            else
                x = z;
```

2. Format the following if statements with indentation.

- a. `if (a < b) if (c > d) x = y;
 else x = z;`
- b. `if (a < b) { if (c > d) x = y; }
 else x = z;`
- c. `if (a < b) x = y; if (a < c) x = z;
 else if (c < d) z = y;`

Answers:

- a. `if (a < b)
 if (c > d)
 x = y;
 else
 x = z;`
- b. `if (a < b) {
 if (c > d)
 x = y;
 }
 else
 x = z;`
- c. `if (a < b)
 x = y;
if (a < c)
 x = z;
else if (c < d)
 z = y;`

6.4 ListBox

No Quick Check Questions.

6.5 The switch Statement



Quick Check

1. What's wrong with the following switch statement?

```
switch ( N ) {  
    case 0:  
    case 1:  x = 11;  
            break;  
    default: System.out.println("Switch Error");  
            break;  
    case 2:  x = 22;  
            break;  
    case 1:  x = 33;  
            break;  
}
```

The case label 1 is repeated twice. Duplicating the case label is invalid. Note: Although placing the default label at the end of the switch statement is preferable, it is not a requirement.

2. What's wrong with the following switch statement?

```
switch ( ranking ) {  
    case >4.55: pay = pay * 0.20;  
                break;  
  
    case =4.55: pay = pay * 0.15;  
                break;  
  
    default:    pay = pay * 0.05;  
                break;  
}
```

The case labels must be an integral value and equality is the only comparison allowed. The labels >4.55 and =4.55 are therefore invalid.

6.6 Sample Program: Drawing Shapes

No Quick Check Questions.