

Solutions to Quick Check Questions

7

Repetition Statements

7.1 The while Statement



Quick Check

1. Write a while statement to add numbers 11 through 20. Is this a count-controlled or sentinel-controlled loop?

```
int sum = 0, i = 11;

while ( i <= 20 ) { //this is a
    sum += i;      //count-controlled
    i++;
}
```

2. Write a while statement to read in real numbers using InputBox and stop when a negative number is entered. Is this a count-controlled or sentinel-controlled loop?

```
int num;

num = inputBox.getDouble();

while ( num >= 0 ) { //this is a
    //sentinel-controlled
```

```

        //do some operation using num

        num = inputBox.getDouble();
    }

```

7.2 Pitfalls in Writing Repetition Statements



Quick Check

1. Which of the following is an infinite loop?

a.

```
int sum = 0, i = 0;
while ( i >= 0 ) {
    sum += i;
    i++;
}
```

Infinite Loop

i gets larger inside the loop.

b.

```
int sum = 0, i = 100;
while ( i != 0 ) {
    sum += i;
    i--;
}
```

Finite Loop

i gets smaller inside the loop and will become zero.

2. For each of the following loop statements, determine the value of sum after the loop is executed.

a.

```
int count = 0, sum = 0;
while ( count < 10 ) {
    sum += count;
    count++;
}
```

45

b.

```
int count = 1, sum = 0;
while ( count <= 30 ) {
    sum += count;
    count += 3;
}
```

145

c.

```
int count = 0, sum = 0;
while ( count < 20 ) {
    sum += 3*count;
    count += 2;
}
```

270

7.3 The do-while Statement



Quick Check

- Write a do-while loop to compute the sum of the first 30 positive odd integers.

```
int num, sum = 0, i = 1;    /* A */

do {

    num = 2*i - 1; //get the i'th odd number

    sum += num;

    i++;

} while ( i <= 30);
```

```
int num = 1, sum = 0, i = 1;    /* A */

do {

    sum += num;

    num += 2; //get the next odd number

    i++;

} while ( i <= 30);
```

- Rewrite the following while loops as do-while loops.

```
a.    int count = 0, sum = 0;
       while ( count < 10 ) {
           sum += count;
           count++;
       }
```

Answer:

```
int count = 0, sum = 0;
do {
    sum += count;
```

```

        count++;
    } while ( count < 10);

b.    int count = 1, sum = 0;
        while ( count <= 30 ) {
            sum += count;
            count += 3;
        }

```

Answer:

```

int count = 1, sum = 0;
do {
    sum += count;
    count += 3;
} while ( count <= 30);

```

7.4 [ResponseBox](#)

1. Write a code to create a **ResponseBox** with three buttons labeled ONE, TWO, and THREE.

```

ResponseBox myBox;
myBox = new ResponseBox(mainWindow, 3);

myBox.setLabel( ResponseBox.BUTTON1, "ONE" );
myBox.setLabel( ResponseBox.BUTTON2, "TWO" );
myBox.setLabel( ResponseBox.BUTTON3, "THREE" );

```

2. Using the **ResponseBox** object created in question 1 above, write code that displays a message indicating which button was clicked.

```

int selection;
selection = myBox.prompt("Click a button");

switch (selection) {
    case ResponseBox.BUTTON1:
        messageBox.show("You clicked ONE");
        break;

    case ResponseBox.BUTTON2:
        messageBox.show("You clicked TWO");
        break;
}

```

```

case ResponseBox.BUTTON3:
    messageBox.show("You clicked THREE");
    break;
}

```

7.5 The for Statement



Quick Check

1. Write a for loop to compute

- a. the sum of 1, 2, ..., 100.
- b. the sum of 2, 4, ..., 500.
- c. the product of 5, 10, ..., 50.

```

a.    sum = 0;
      for (int i = 1; i <= 100; i++) {
          sum += i;
      }

b.    sum = 0;
      for (int i = 2; i <= 500; i+=2) {
          sum += i;
      }

c.    sum = 0;
      for (int i = 5; i <= 50; i+=5) {
          sum += i;
      }

```

2. Rewrite the following while loops as for statements.

```

a.    int count = 0, sum = 0;
      while ( count < 10 ) {
          sum += count;
          count++;
      }

```

Answer:

```

sum = 0;
for (int count = 0; count < 10; count++) {

```

```
    sum += count;
}
```

```
b.    int count = 1, sum = 0;
      while ( count <= 30 ) {
          sum    += count;
          count += 3;
      }
```

Answer:

```
sum = 0;
for (int count = 1; count <= 30; count+=3) {
    sum += count;
}
```

7.6 Nested-for Statements

- What will be the value of sum after the following nested-for loops are executed?

```
a.    int sum = 0;
      for (int i = 0; i < 5; i++) {
          sum = sum + i;
          for (int j = 0; j < 5; j++) {
              sum = sum + j;
          }
      }
```

60

```
b.    int sum = 0;
      for (int i = 0; i < 5; i++) {
          sum = sum + i;
          for (int j = i; j < 5; j++) {
              sum = sum + j;
          }
      }
```

50

- What is wrong with the following nested-for loop?

```
int sum = 0;
for (int i = 0; i < 5; i++) {
    sum = sum + i;
    for (int i = 5; i > 0; i--) {
        sum = sum + j;
    }
}
```

```
}
```

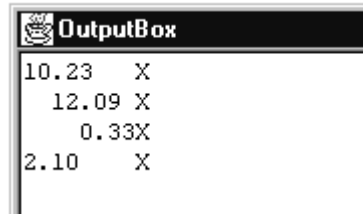
The same variable i is used in both loops. The variable j is not declared nor assigned an initial value.

7.7 The Format Class

1. Determine the output of the following code:

```
outputBox.println(Format.leftAlign(8,2,10.23)+ "X");  
outputBox.println(Format.centerAlign(8,2,12.094)+ "X");  
outputBox.println(Format.rightAlign(8,2,0.3333)+ "X");  
outputBox.println(Format.leftAlign(8,2,2.1)    + "X");
```

Answer:



2. What's wrong with the following code?

```
1 —> outputBox.println(Format.centerAlign(2,1033.23)+ "Y");  
2 —> outputBox.println(Format.leftAlign(12.94, 6, 2)+ "Y");  
3 —> outputBox.println(Format.rightAlign(6,2,"Hi") + "Y");
```

1. Need a second argument to specify the decimal places

2. The number to display must be the third argument.

3. Cannot specify the decimal places if the value to display is a String.

7.8 Loan Tables

No Quick Check Questions.

7.9 Sample Program: Hi-Lo Game

No Quick Check Questions.

7.10 (Optional) Recursive Methods

No Quick Check Questions.