

Montgomery College, CMSC 203
Worksheet1
Module 3

Objectives

- Increment , decrement operators
- Post and pre increment
- for Loop
- while Loop
- do while Loop

Concept Questions

1. What will be the values of x and y as a result of the following code?

```
int x = 25, y = 8;  
x += y++;
```

- a. x = 25, y = 8
- b. x = 33, y = 8
- c. x = 33, y = 9
- d. x = 34, y = 9

ANS: C

2. What will be the value of x after the following code is executed?

```
int x, y = 4, z = 6;  
x = (y++) * (++z);
```

- a. 24
- b. 28

- c. 30
- d. 35

ANS: B

3. Which of the following for loop headers will cause the body of the loop to be executed 100 times?

- a. `for(int i = 0; i <= 100; i++)`
- b. `for(int i = 1; i < 100; i++)`
- c. `for(int i = 1; i <= 101; i++)`
- d. `for(int i = 0; i < 100; i++)`
- e. none of these for loops will execute the loop body 100 times

Answer: d

Explanation: For choice a, the variable *i* has the values 0, 1, 2, ..., 99, and 100, which are 101 values. For choice b, the values of *i* are 1, 2, 3, ..., 97, and 98, which are 98 values. For choice c, the values of *i* are 1, 2, 3, ..., 100, and 101, which are 101 values.

4. The code below is supposed to add the numbers from 1 up to and including 10. It does not calculate the correct sum. The problem is caused by a(n) _____ error.

```
int sum = 0;
for (int count = 1; count < 10; count++)
    sum += count;
```

- a. syntax
- b. compilation
- c. requirement
- d. off-by-one
- e. testing

Answer: d

Explanation: An off-by-one error occurs when a loop body is executed either one too many times or one too few times. The problem is solved if the boolean condition is replaced by `count <= 10`.

5. What is output by the following code fragment?

```
int num = 0;
int max = 10;

while(num < max) {
    System.out.print(num + " ");
    num += 2;
}
```

Answer:

This code will output the following:

0 2 4 6 8

6. How many times will the body of a while loop be executed if the boolean expression is false the first time that the while statement is encountered?

Answer: The body will not be executed at all. The expression of a while loop is evaluated before the body is executed, so a false expression means that the body will not be executed.

7. In the following code, what values could be read into number to terminate the while loop?

```
Scanner keyboard = new Scanner(System.in);
System.out.print("Enter a number: ");
int number = keyboard.nextInt();
while (number < 100 && number > 500)
{
    System.out.print("Enter another number: ");
    number = keyboard.nextInt();
}
```

}

- a. Numbers less than 100 or greater than 500
- b. Numbers in the range 100 - 499
- c. Numbers in the range 100 - 500
- d. The `boolean` condition can never be true

ANS: D

8. What will be the value of x after the following code is executed?

```
int x = 10;
do
{
    x *= 20;
}
while (x > 5);
```

- a. 10
- b. 200
- c. This is an infinite loop.
- d. The loop will not be executed, the initial value of $x > 5$.

ANS: C

Programming Questions

1. Rewrite the following code fragment using a for loop instead of a while loop.

```
int i = 0;

while(i < 50) {
    System.out.println(i);
    i+=2;
}
```

Answer:

```
for(int i = 0; i < 50; i+=2)
    System.out.println(i);
```

2. Write a code fragment that determines how many times the character 'A' appears in a `String` object called `name`.

Answer:

```
int countA = 0;

for(int i = 0; i < name.length(); i++)
    if(name.charAt(i) == 'A')
        countA++;

System.out.println("A appears " + countA + " times in " + name + ".");
```

3. Write a code fragment that prints every other character in a `String` object called `word` starting with the first character.

```
for (int index = 0; index < word.length(); index +=2)
```

```
System.out.println(word.charAt(index));
```