COMP 110 – Chapter 1 & 2 Review

1. How many bits are in a byte? 8____ What are the possible values of a bit? 1 or 0________

2. The ___Central Processing Unit (CPU)_____ is known as “the brain” of the computer.
   Is it hardware or software? ___Hardware____________________

3. Write the line of code that would print out the line:
   
   COMP 110 is my favorite class.
   
   System.out.println(“COMP 110 is my favorite class.”);

4. Write the lines of code that would declare two variables called miles and time. Declare miles as type int and initialize it to zero. Declare time as type double and initialize it to 40.5.
   
   int miles = 0;
   double time = 40.5;

5. Write the two lines of code needed to read an integer from the keyboard:
   
   Scanner keyboard = new Scanner(System.in);
   int myInt = keyboard.nextInt();
   
   What is the import statement that is needed at the top of the file for the above lines to work?
   
   import java.util.*;

6. Given the line of code below, what data value is stored in myDouble? 0.0____
   
   double myDouble = ( 1 / 2 ) * 5.0
   
   The expression (1/2) uses integer division, which results in 0. 0 * 5 is still 0.

7. Suppose the line were changed as follows, what data value is stored in myDouble instead? 2.5____
   
   double myDouble = ( 1.0 / 2.0 ) * 5.0

8. Which of the following are illegal variable names? (circle them)
   
   myInt 3blindMice $money! ____input
total-cost magicalFluffyBunnies 123 public
9. What is the output produced by the following lines of code?

```java
cchar a, b;
a = 'b';
System.out.println(a);  // Output: b
b = 'c';
System.out.print(b);    // Output: c
a = b;
System.out.println(a);  // Output: c
```

10. Suppose that mary is an object of class Person, and suppose that increaseAge is a method of class Person that uses one argument: an integer. Write the invocation of the method increaseAge for object mary using the argument 5.

```java
mary.increaseAge(5);
```

11. Fill in the blanks with the correct values:

- $5 \% 2 = \_\_\_ \_\_ 1 \_\_\_\_\_
- $82 \% 60 = \_\_\_\_\_ 22 \_\_\_\_\_
- $12 \% 4 = \_\_\_\_\_ 0 \_\_\_\_\_
- $24 \% 14 = \_\_\_\_\_ 10 \_\_\_\_\_

12. What is the value of myInt after each line of code is executed?

<table>
<thead>
<tr>
<th>myInt</th>
<th>0</th>
<th>1</th>
<th>6</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>int myInt = 0;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>myInt++;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>myInt = myInt + 5;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>myInt -= 3;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System.out.println(&quot;the value is: &quot; + myInt);</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. What kind of error would you get from the following line of code? How would you fix it?

```java
byte myByte = 5;
```

*It is a compiler error. Fix it by adding the indicated semicolon.*

14. What are the values of the variables n and m after executing the following code?

```java
int n, m, temp;
n = 10;
m = 20;
temp = n;
n = m;
m = temp;

n is \textcolor{red}{20}. m is \textcolor{red}{10}.
```
15. In the four lines of code that comprise the main method below, underline all classes, circle all objects, draw boxes around all methods, and draw a line through all arguments.

Solution 1: Based on material presented so far, we’ve called the object that allows for printing to the console System.out.

```java
public class TestProgram
{
    public static void main(String[] args)
    {
        String myString = "This is a string";
        int len = myString.length();
        System.out.println("The length is "+ len);
        String shortString = myString.substring(10);
    }
}
```

Solution 2: Technically, System is another class and has a static member variable named out, which is an object. Exactly what that means will be explored in a later week.

```java
public class TestProgram
{
    public static void main(String[] args)
    {
        String myString = "This is a string";
        int len = myString.length();
        System.out.println("The length is "+ len);
        String shortString = myString.substring(10);
    }
}
```

16. The factorial (denoted as ! in mathematics) of a number is the product of that number and all positive integers less than it. For example,

\[
3! = 3 \times 2 \times 1 = 6 \\
5! = 5 \times 4 \times 3 \times 2 \times 1 = 120
\]

Write the pseudocode (English or a mix of English and code is fine) that prompts the user for an integer and then outputs the factorial of that number.

```
Prompt the user for an integer value
Declare integer total, initially 1
While value is strictly greater than zero
    total *= value
    Decrement value by 1
Display total
```