COMP 248 - Tutorial #2 - SOLUTION

Java Fundamentals

Question 1: What is the **type** of the values `0`, `0.0`, `'0'` and `"0"`?

`0`: int `0.0`: double `'0'`: char `"0"`: String

Question 2: Which of the following are **legal identifiers**?

`Greetings` - legal

`g` - legal

`void` – illegal – reserved word

`1001dalmatians` – illegal – starts with a digit

`Hello, world` – illegal – has a comma

`<greeting>` - illegal – starts with <

Question 3: Given the following **declarations**, what is result is stored in each of the listed assignment statements?

```
int iResult, num1 = 25, num2 = 40, num3 = 17, num4 = 5;
double fResult, val1 = 17.0, val2 = 12.78;
iResult = num1 / num4; // 5
fResult = num1 / num4; // 5.0
iResult = num3 / num4; // 3
fResult = num3 / num4; // 3.0
fResult = val1 / num4; // 3.4
fResult = val1 / val2; // 1.3302034428794993
iResult = num1 / num2; // 0
iResult= num3 % num4;  // 2
iResult= num2 % num3;  // 6
iResult= num3 % num2;  // 17
iResult= num2 % num4;  // 0
```

Question 4: Strings

A- What is the output of:

```
String s1, s2, s3;
s1 = "Quest for the holy Grail";
s2 = s1.toLowerCase();
s3 = s1 + " " + s2;
System.out.println(s3.replace('h', 'z'));
```

```
Quest for tze zoly Grail quest for tze zoly grail
```

B- What is the **length** of the string `"mississipi"`? What is the **index** of the last character?

Length: 10
Index last character: 9

C- Assume the String variable s contains the value `"Agent"`.
What is the effect of the assignment `s = s + s.length()` ?
What about `s+= s.length();`

Both result in `s = "Agent5"`

D- Assume the following declaration: `String name = "Your Name Here";`
What is the value of each of the following expressions?

```
name.substring(9) ;       //" Here"
name.substring(1,6);      //"our N"
name.substring(1, name.length()-1); //"our Name Her"
name.length();            //14
name.indexOf('r');        //3
name.indexOf('n');        //-1
```

Question 5: Console Input/Output

A- What is the output of:

```
System.out.println("result: 3+4");       // result: 3+4
System.out.println("result: " + 3+4);    // result: 34
System.out.println("result: " + 3+"4"); // result: 34
System.out.println("result: " + (3+4)); // result: 7
```

B- Write a statement to display on the console the message:
`"The file is in c:\Temp\theFile.txt"`

```
System.out.println("The file is in c:\\Temp\\theFile.txt");
```

C- Suppose that the variable `in` is a Scanner object that reads from `System.in`, and your program calls: `String name = in.next();`
What is the value of name if the user enters `John Q. Public`?

```
name = "John"
```

Question 6: Try to predict the output of the following program. Then run it to make sure your answers are right.

```
/**
* Question.java
*/
public class Question
{
   public static final String sentence = "I hate programming.";
   public static void main (String[] args)
   {
      int position = sentence.indexOf("hate");
      String firstPart = sentence.substring(0, position);
      String afterHate = sentence.substring(position + 4);
      String newString = firstPart + "love" + afterHate;
      System.out.println("The line of text to be hanged is: ");
      System.out.println(sentence);
      System.out.println("I have rephrased the line to read:");
      System.out.println(newString);
   }// end of main ()
}// Question
```

Answer:

```
The line of text to be changed is:
I hate programming.
I have rephrased the line to read:
I love programming.
```

Question 7: The following Java program contains several syntax errors. Identify and correct then. Then try to compile the program to make sure your answers are right.

```
/* Purpose: This program calculates the final price of a
purchase including a 15% sales tax */
import java.util.Scanner;
public class Price
{
   public static void main (String[] args)
   {
      Scanner keyboard = new Scanner(System.in);
      final double TAX_RATE = 0.15;
      int quantity;
      double subtotal, tax, totalCost, unitPrice;
      System.out.print ("Enter the quantity: ");
      quantity = keyboard.nextInt();
      System.out.print ("Enter the unit price: ");
      unitPrice = keyboard.nextDouble();
      subtotal = quantity * unitPrice;
      tax = subtotal + TAX_RATE;
      totalCost = subtotal + tax;
      // Print output */
      System.out.println ("Subtotal: " + subtotal);
      System.out.println ("Tax: " + tax);
      System.out.println ("Total: " + totalCost);
   }
}
```