**Unit 1: Introduction to Objects and Strings**

Answer the questions and complete the programs in preparation for the end of Unit exam

**Review Questions:**

1. Explain the difference between an object and a class.  
   *An object is defined within a class and its value can be changed, whereas a class has its pathways prewritten.*
2. Declare and initialize variables needed for holding the price and description of an item that is for sale.  
   *double price = 1.99;  
   String desc = “Pack of gum.”;*
3. Write Java statements that initialize a string message with “Hello” and then change it to “HELLO”. Use the toUpperCase method.  
   *String msg = “Hello”;  
   msg = msg.toUpperCase();*
4. Find the errors in the following statements:
   1. Rectangle r = new Rectangle(5,10,15,20);
   2. Double width = r.getWidth();
   3. r.translate(15,15);
   4. r = new Rectangle();  
      r.translate(100,100);
5. Consult the API documentation to find methods for
   1. Concatenating two strings, that is, making a string consisting of the first string followed by the second string.  
      *str.append();  
      str.toString();*
   2. Removing leading and trailing white space of a string.  
      *str.trim();*
   3. Converting a rectangle to a string.

*r.toString();*

* 1. Computing the smallest rectangle that contains two given rectangles.  
     *Rectangle r3 = r1.add(r2);*
  2. Returning a random floating-point number.  
     *rand.nextFloat();*

**Exercises:**

1. Write a program that constructs a rectangle with an area of 42 and a rectangle with a perimeter of 42. Print the widths and heights of both rectangles.  
   *import java.awt.Rectangle;*

*class Main {*

*public static void main(String[] args) {*

*Rectangle rArea = new Rectangle(0,0,6,7);*

*Rectangle rPer = new Rectangle (0,0,20,1);*

*System.out.println("Rectangle 1 \n Width: " + rArea.getWidth() + " Height: " + rArea.getHeight());*

*System.out.println("Rectangle 2 \n Width: " + rPer.getWidth() + " Height: " + rPer.getHeight());}*

*}*

1. Write a program HollePrinter that switches the letters “e” and “o” in a string. Use the replace method repeatedly. Demonstrate that the string “Hello World!” turns into “Holle Werld!”

*class Main {*

*public static void main(String[] args) {*

*String str = "Hello world!";*

*String str1 = str.replace('e','1');*

*String str2 =str1.replace('o','e');*

*String str3 =str2.replace('1','o');*

*System.out.print(str3);}*

*}*

1. The Random class implements a random number generator, which produces sequences of numbers that appear to be random. To generate random integers, you construct an object of the Random class, and then apply the nextInt method. For example, the call generator.nextInt(6) gives you a random number between 0 and 5.

Write a program DieSimulator that uses the Random class to simulate the toss of a die, printing a random number between 1 and 6 every time the program is run.  
*import java.util.Random;*

*class Main {*

*public static void main(String[] args) {*

*Random generator = new Random();*

*System.out.print(generator.nextInt(6)+1);}*

*}*