**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.

A class is a definition and an object is an individual instance of a class

1. Declare and initialize variables needed for holding the price and description of an item that is for sale.
2. Write Java statements that initialize a string message with “Hello” and then change it to “HELLO”. Use the toUpperCase method.

String message = “Hello”;

message = message.toUpperCase();

1. Find the errors in the following statements:
   1. Rectangle r = (5,10,15,20);

Rectangle r = new **Rectangle**(5,10,15,20);

* 1. Double width = Rectangle(5,10,15,20).getWidth();

Double width = **new** Rectangle(5,10,15,20).getWidth();

* 1. Rectangle r;  
     r.translate(15,15);

Rectangle r **= new Rectangle()**;  
r.translate(15,15);

* 1. r = new Rectangle();  
     r.translate(“far, far away!”);

translate(5, 5) does not accept Strings.

1. 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.

String result = string1 + string2;

* 1. Removing leading and trailing white space of a string.

string1 = string1.trim();

* 1. Converting a rectangle to a string.

String string1 = rect1.toString();

* 1. Computing the smallest rectangle that contains two given rectangles.

Rectangle rect3 = rect1.union(rect2);

* 1. Returning a random floating-point number.

Double random = Math.random();

**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.

Rectangle rect1 = new Rectangle(6, 7);

System.out.println(rect1.getWidth());

System.out.println(rect1.getHeight());

Rectangle rect2 = new Rectangle(6, 15);

System.out.println(rect2.getWidth());

System.out.println(rect2.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!”
2. 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.