**Object Oriented Programming in Java (Lab 5)**

**Problem:**

1. Define the abstract GeometricObject as the base class for all classes like Circle, Rectangle,

Triangle... defined earlier. It should have abstract method getArea and getPerimeter. Define

a generic method costOfPainting(GeometricObject g) and use to find cost for different geometric objects placed in an array based on the User.

2. (Enabling GeometricObject comparable) Modify the GeometricObject class to implement

the Comparable interface, and define a static max method in the GeometricObject class for

finding the larger of two GeometricObject objects. Implement the new GeometricObject class. Write a test program that uses the max method to find the larger of two circles and the larger of two rectangles.

3. (The Colorable interface) Design an interface named Colorable with a void method named

howToColor(). Every class of a colorable object must implement the Colorable interface. Modify class Square that now extends GeometricObject and implements Colorable. Implement howToColor to display a message "Color all four sides".

4. Write a test program that creates an array of five GeometricObjects. For each object in the

array, invoke its howToColor method if it is colorable.

5. (Finding the largest object) Write a method that returns the largest object in an array of

objects. The method signature is:

public static Object max(Comparable[] a)

All the objects are instances of the Comparable interface. The order of the objects in the

array is determined using the compareTo method. Write a test program that creates an

array of ten strings and an array of ten integers and finds the largest string and integer in the arrays.

**Structure:**

1. Package SNU.geometryUtil contains 7classes: GeometricObject, Rectangle, Triangle, Square, Circle, IllegalTriangleException and Colorable.

Default Package contains GeometricObjectMain class which contains the main function for the program.

2. Same as 1 as the implementation is done in the same main function.

3. Package SNU.geometryUtil contains Interface Colorable.

Default package contains InterfaceMain class which contains the main function for the program.

4. Same as 3 as the implementation is done in the same main function.

5. Default Package contains class Maximum which has the main function.

**Input:**

1. Program prompts the user to enter the number of objects in the array first. It then asks which object to create and it's dimensions.

2. Program asks the user to enter the dimensions for the two circles and two rectangles to be compared.

3. No input required.

4. User is required to enter the choice of objects to be created and then enter the dimensions.

5. No input required.

**Output:**

1. The program displays total cost of painting the objects at the rate of 18.88$/square meter.

2. The program displays which circle is larger and then which rectangle is larger.

3.The program simply checks whether the howToColor function can be called or not which in this case can be done as the object is of Square class.

4. The program displays the object number for which howToColor() is called.

5. The program displays the largest values from the respective arrays.