Year 3 CSE

Java Programming Lab 1

Instructions:

This work should be done in group of 1-3 students.

Deadline: **25-March 2019**

Tools: **Netbeans**

Presentation deadline: **29-March 2019**

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A **polygon** is any 2-dimensional **shape** formed with straight lines. Triangles, quadrilaterals, pentagons, and hexagons are all examples of **polygons.**

Each Polygon has a name and number of sides.

The total interior angle sum is calculated by (n-2)*180. Where n is number of sides.

1. Create an interface Polygon with the following methods

Method Name	Return Type	Example
getName()	String	Hexagon
getNumberOfSides()	Int	6 sides
totalIntAngleSum()	Int	720 degrees

2. As given in examples, a Quadrilateral is a polygon. But we have different quadrilaterals. E.g. Square, Rectangle, Trapezium etc..
   The area and perimeter of them is calculated using the following formulars
   Area of Square= side *side
   Area of Rectangle= length * width
   Area of Trapezium=(a+b)h/2 a:small base b:big base h: height

   Create the Class Quadrilateral with three methods with the same name that will help you to return the area depending on the figure given.

In this class create 3 constructors,

i. With one parameters that will print the type of Quadrilateral given.

ii. Without parameters that will print the message “Hello Student”

iii. With 2 parameters that will print the name of the user and type of Quadrilateral.

3. Create a class Square that will use getArea() method in Quadrilateral class without creating an instance of class Quadrilateral.
   Call a constructor with 1 parameter in Quadrilateral.
   NB: Values should be entered by the user

4. Create a class Rectangle that will use getArea() method in Quadrilateral display the area of it by creating an instance of class Quadrilateral.
   Call a constructor with 2 parameters in Quadrilateral.
   NB: Values should be entered by the user

5. Create class Trapezium that will implement all methods that were defined by Interface Polygon and display the area. Call a default constructor in Quadrilateral class.
   In Main Method of this class, create its instance that will help to access implemented methods.
   Create a static method that will print thank you message without retuning anything.
   NB: Values should be entered by the user.

6. Discussion
   With the help the above lab explain how the following concepts were applied.
   1. Inheritance
   2. polymorphism,
   3. Abstraction
   4. method overloading
   5. method overriding

Modify the program so that it runs successfully.