Lab 20

Instructions: Complete the steps below. Be sure to show your code to one of the lab TAs before you leave, so that you can receive credit for this lab. You must also upload a copy of all your source code (.java) files to the link on Blackboard by **11:59 PM on Wednesday November 11, 2020 for L01, L02, L03, L05 and by 11:59 PM on Tuesday November 10, 2020 for L06, L07, L08 and L09**.

1. Design a class named Stock that contains:
   - A string data field named symbol for the stock's symbol.
   - A string data field named name for the stock's name.
   - A double data field named previousClosingPrice that stores the stock previous price for the previous day.
   - A double data field named currentPrice that stores the stock price for the current time.
   - A constructor that creates a stock with the specified symbol and name.
   - A method named getChangePercent() that returns the percentage changed from previousClosingPrice to currentPrice.

   Write a test program that creates a Stock object with the symbol ORCL, the name Oracle Corporation, and the previous closing price of 34.5. Set a new current price to 34.35 and display the price-change percentage.

2. In an n-sided regular polygon, all sides have same length and all angles have the same degree (i.e., the polygon is both equilateral and equiangular). Design a class named RegularPolygon that contains:
   - A private int data field named n that defines the number of sides in the polygon with default value 3.
   - A private double data field named $side$ that stores the length of the side with default value 1.
   - A private double data field named x that defines the x-coordinate of the polygon's center with default value 0.
   - A private double data field named y that defines the y-coordinate of the polygon's center with default value 0.
   - A no-arg constructor that creates a regular polygon with default values.
   - A constructor that creates a regular polygon with the specified number of sides and length of side, centered at (0, 0).
   - A constructor that creates a regular polygon with the specified number of sides, length of side, and x-coordinate and y-coordinate.
   - The accessor and mutator for all data fields. [accessors are the getters and mutators are the setters]
   - The method getPerimeter() that returns the perimeter of the polygon.
   - The method getArea() that returns the area of the polygon. The formula for computing the area for a regular polygon is

   $$Area = \frac{n \times s^2}{4 \times tan\left(\frac{\pi}{n}\right)}$$

Write a test program that creates three RegularPolygon objects, created using the no-arg constructor, using RegularPolygon(6, 4), and using RegularPolygon(10, 4, 5.6, 7.8). For each object, display its perimeter and area.

Grading Guidelines: This lab is graded on a scale of 0-6 points, assigned as follows:
- **0 points:** Student is absent or does not appear to have completed any work for the lab
- **2 point (2*1):** Student has written the program, but it has errors.
- **4 points (2*2):** Student has written the program it compiles without error, but it does not produce the correct output.
- **6 points (2*3):** Student has written the program and it compiles and runs correctly, without any errors.