Object-Oriented Programming

Lab session #1

Question 1: Rectangle Visualization (25 points)

Write a class Rectangle which has

- Two attributes *width* and *height* with appropriate getter methods
- A constructor that requires values for width and height of the rectangle. If either of the inputs is negative, print an error message and set the corresponding attribute to 1.
- A *visualize* method to display the rectangle using * symbol

Write a class TestRectangle with a *main* method to instantiate 5 different rectangles and visualize them.

Question 2: Triangle Verification (25 points)

Write a Triangle class which has 3 attributes, the length of 3 sides. The class has appropriate constructor and get methods. This class has a method String verify() to check and return type of the Triangle. The types can be Not Triangle, Equilateral, Isosceles or Scalene. Create another class which has a main() method to receive the length of 3 sides, verify it and display the result.

Question 3: Distance (25 points)

Write a Point class that has private attributes for coordinates x and y. The class has constructor to get values for x and y of the point. In the class WITHOUT having getter methods for x and y, write a method

double distance(Point target)

to compute the distance from the current point and the given target point.
Note: the distance *d* between two points A and B can be computed with the following formula

$$d = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2}$$

Write a class with a main method to test the class Point and the distance method

Question 4: E-commerce Order (25 points)

You are required to program Order and Item class satisfied the requirements as follows:

1. Each order has an ID

2. Each order has a list of Items

3. Each item has an ID, a name and a price

4. Each class has appropriate constructors, get and set methods

5. Class Order has a method double calculateAverageCost() to calculate the average of the cost of all items in an order

6. Create a class which has a main() method to receive the inputs of items of an order from keyboard and display the averageCost