Offline1

Deadline: 8:30 PM, 1 Nov (Sec 6 & Sec 7)

Problem Description

You will need to write one file: Quadrilateral.java. A simple driver class TestQuadrilateral.java has been provided, and it will allow you to interact with your simulation. You are also provided with another class Point.java which help you to deal with 2d points. Specific instructions for each file are given in later sections.

Solution Description

`Quadrilateral.java`

Your `Quadrilateral.java` should have the following fields, methods and constructors

- `private Point p1, p2, p3, p4`: These fields are the names of the four points of a quadrilateral and they should be initialized in the constructor. The points passed as arguments will in counter-clockwise order
- `public Quadrilateral(double x1, double y1, double x2, double y2, double x3, double y3, double x4, double y4)`: This is the constructor of the class and it takes the dimension of the four points as its parameter
- `public Quadrilateral(Point p1, Point p2, Point p3, Point p4)`: This is another constructor of the class and it takes four points as its parameter
- `public boolean isRectangle()`: This method returns true if the quadrilateral is a rectangle or false otherwise
- `public boolean isSquare()`: This method returns true if the quadrilateral is a square or false otherwise
- `public boolean isRhombus()`: This method returns true if the quadrilateral is a rhombus or false otherwise
- `public boolean isParallelogram()`: This method returns true if the quadrilateral is a parallelogram or false otherwise
- `public boolean isOrdinary()`: This method returns true if the quadrilateral is not any of the followings: rectangle, square, rhombus, parallelogram or returns false otherwise.
- `public String toString()`: This method returns the dimension of the 4 points

`Point.java`

Your `Point.java` should have the following fields, methods and constructors

- `private double x, y`: These fields are the name of the dimensions of a 2d point
- `public Point(double x, double y)`: This is the constructor of Point class and it takes the dimensions as its parameters

- `public double distance(Point p):` This method returns the distance between itself and a point p, passed as a parameter
- `public double slope(Point p):` This method returns the slope of the straight line created by itself and the point p, passed as a parameter
- `public String toString():` This method returns the dimensions of the point

Running and Testing

`TestQuadrilateral.java`

`TestQuadrilateral.java` has been provided for you. It creates several instances of quadrilateral, and allows the user to interact with them. You can run the main method to start a simulation, and test from there.

```
Quadrilateral q1, q2, q3, q4, q5, q6, q7;
q1 = new Quadrilateral(10, 20, 40, 20, 40, 40, 10, 40);
q2 = new Quadrilateral(20, 30, 40, 30, 40, 50, 20, 50);
Point p1 = new Point(50, 30);
Point p2 = new Point(150, 30);
Point p3 = new Point(100, 60);
Point p4 = new Point(60, 70);
q3 = new Quadrilateral(p1, p2, p3, p4);
q4 = new Quadrilateral(6, 7, 36, 7, 48, 26, 18, 26);
q5 = new Quadrilateral(2, -4, 9, -3, 4, 2, -3, 1);
q6 = new Quadrilateral(1, -2, 4, 1, 1, 4, -2, 1);
q7 = new Quadrilateral(39, 2, 47, 16, 16, 34, 8, 20);

System.out.println(q1.isSquare());
System.out.println(q1.isRectangle());
System.out.println(q1.isRhombus());
System.out.println(q1.isParallelogram());
System.out.println(q1.isOrdinary());
System.out.println();

System.out.println(q2.isSquare());
System.out.println(q2.isRectangle());
System.out.println(q2.isRhombus());
System.out.println(q2.isParallelogram());
System.out.println(q2.isOrdinary());
System.out.println();

System.out.println(q3.isSquare());
System.out.println(q3.isRectangle());
System.out.println(q3.isRhombus());
System.out.println(q3.isParallelogram());
System.out.println(q3.isOrdinary());
System.out.println();

System.out.println(q4.isSquare());
System.out.println(q4.isRectangle());
```

```
System.out.println(q4.isRhombus());
System.out.println(q4.isParallelogram());
System.out.println(q4.isOrdinary());
System.out.println();

System.out.println(q5.isSquare());
System.out.println(q5.isRectangle());
System.out.println(q5.isRhombus());
System.out.println(q5.isParallelogram());
System.out.println(q5.isOrdinary());
System.out.println();

System.out.println(q6.isSquare());
System.out.println(q6.isRectangle());
System.out.println(q6.isRhombus());
System.out.println(q6.isParallelogram());
System.out.println(q6.isOrdinary());
System.out.println();

System.out.println(q7.isSquare());
System.out.println(q7.isRectangle());
System.out.println(q7.isRhombus());
System.out.println(q7.isParallelogram());
System.out.println(q7.isOrdinary());
```

Output

```
true
false
false
false
false

false
true
false
false
false

false
false
false
false
true

false
false
false
```

true
false

false
false
true
false
false

true
false
false
false
false

false
true
false
false
false