**COMPLETED**

# Graded Lab 2

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## Triangle.java

```java
package SNU.gr2;

import java.util.*;

public class Triangle{
        private Point a,b,c;

        public Triangle (Point x, Point y, Point z) {
                this.a = x;
                this.b = y;
                this.c = z;
        }

        public Triangle(){
                this.a = new Point(0,0);
                this.b = new Point(0,0);
                this.c = new Point(0,0);
        }

        public void setFromUser(){
                Scanner s = new Scanner(System.in);
                System.out.println("Enter data for Point a");
                a.setFromUser();
                System.out.println("Enter data for Point b");
                b.setFromUser();
                System.out.println("Enter data for Point c");
                c.setFromUser();
        }

        public double getArea() {

                double x1 = a.getX(), x2 = b.getX(), x3 = c.getX();
                double y1 = a.getY(), y2 = b.getY(), y3 = c.getY();
                /*System.out.print(x1);
                System.out.print(x2);
                System.out.print(x3);
                System.out.print(y1);
                System.out.print(y2);
                System.out.print(y3);*/

                double area = (0.5)*(x1*(y2-y3) + x2*(y3-y1) + x3*(y1-y2));
                //System.out.println(area);
                return area;
```

```
        }

        public boolean isInside(Point p) {
                Triangle A1 = new Triangle(p,a,b);
                Triangle A2 = new Triangle(p,b,c);
                Triangle A3 = new Triangle(p,a,c);
                double LHS = Math.abs(this.getArea()), RHS =
Math.abs(A1.getArea()) + Math.abs(A2.getArea()) + Math.abs(A3.getArea());

                System.out.println(LHS);
                System.out.println(RHS);

                if(LHS == RHS){
                        return true;
                }
                else{
                        return false;
                }
        }

        public boolean isInside(LineSegment l){
                if(isInside(l.getA()) && isInside(l.getB())){
                        return true;
                }
                else{
                        return false;
                }
        }
}
```

# Point.java

```
package SNU.gr2;

import java.util.*;

public class Point{
        private double x,y;

        public Point(double a, double b){
                this.x = a;
                this.y = b;
        }

        public Point(){
                this.x = 0.0;
                this.y = 0.0;
        }

        public double getX(){
                return this.x;
        }

        public double getY(){
                return this.y;
        }
```

```
	public void setX(double z){
		x = z;
	}

	public void setY(double z){
		y = z;
	}

	public void setFromUser(){
		Scanner s = new Scanner(System.in);
		System.out.println("Enter the data for the Point");
		System.out.print("x: ");
		x = s.nextDouble();
		System.out.print("y: ");
		y = s.nextDouble();
	}

}
```

# LineSegment.java

```
package SNU.gr2;

import java.util.*;


public class LineSegment{
	private Point a,b;

	public LineSegment (Point x, Point y) {
		this.a = x;
		this.b = y;
	}

	public LineSegment(){
		this.a = new Point(0,0);
		this.b = new Point(0,0);
	}

	public Point getA(){
		return a;
	}

	public Point getB(){
		return b;
	}

	public void setFromUser(){
		Scanner s = new Scanner(System.in);
		System.out.println("Enter data for Point a");
		a.setFromUser();
		System.out.println("Enter data for Point b");
		b.setFromUser();
	}


	public boolean isInside(Point p) {
```

```
                double x1 = a.getX(), x2 = b.getX(),
                           y1 = a.getY(), y2 = b.getY();

                if(p.getX() >= x1 && p.getX() <= x2){
                        if(p.getY() >= y1 && p.getY() <= y2){
                                double m = (y2 - y1)/(x2 - x1);

                                double LHS = p.getY();
                                double RHS = m * p.getX();

                                //System.out.println(LHS);
                                //System.out.println(RHS);

                                if(LHS == RHS){
                                        return true;
                                }
                                else{
                                        return false;
                                }
                        }
                }
                return false;

        }
}
```

# Mainclass.java

```
package Test;

import java.util.*;

import SNU.gr2.*;

public class Mainclass{

        public static void main(String args[]){

                Scanner s = new Scanner(System.in);

                Point x = new Point();

                Triangle t = new Triangle();

                LineSegment l = new LineSegment();

                /*System.out.println("Enter Tester Point Values:");
                x.setFromUser();
                System.out.println("Enter Tester Triangle Values:");
                t.setFromUser();
                System.out.println("Enter Tester Line Values:");
                l.setFromUser();
        */
                boolean exit = false;

                while(!exit){
                        System.out.println("Check for point or line is in a
triangle or want to exit (1/2/3)");
                        int choice = s.nextInt();
```

```
                        if(choice == 1){
                                x.setFromUser();

                                System.out.println("Check if is inside line or
triangle or exit(1/2/3)");
                                int secondchoice = s.nextInt();

                                if(secondchoice == 1){
                                        l.setFromUser();
                                        System.out.println(l.isInside(x));
                                }
                                else if(secondchoice == 2){
                                        t.setFromUser();
                                        System.out.println(t.isInside(x));
                                }
                                else if(secondchoice == 3){
                                        exit = true;
                                }
                        }
                        else if(choice == 2){
                                l.setFromUser();

                                System.out.println("Check if is inside triangle
or exit(1/2)");
                                int secondchoice = s.nextInt();

                                if(secondchoice == 1){
                                        t.setFromUser();
                                        System.out.println(t.isInside(x));
                                }
                                else if(secondchoice == 2){
                                        exit = true;
                                }
                        }
                        else if(choice == 3){
                                exit = true;
                        }
                }



        }

}
```

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/lab/gr2
rohan@rohan-K53SV:~/projects/monsoon/java/course/lab/gr2$ java Test.Mainclass cl
Check for point or line is in a triangle or want to exit (1/2/3)
1
Enter the data for the Point
x: 4
y: 4
Check if is inside line or triangle or exit(1/2/3)
2
Enter data for Point a
Enter the data for the Point
x: 0
y: 5
Enter data for Point b
Enter the data for the Point
x: 5
y: 0
Enter data for Point c
Enter the data for the Point
x: 5
y: 5
12.5
12.5
true
Check for point or line is in a triangle or want to exit (1/2/3)
1
Enter the data for the Point
x: 2
y: 3
Check if is inside line or triangle or exit(1/2/3)
2
Enter data for Point a
Enter the data for the Point
x: 0
y: 5
Enter data for Point b
Enter the data for the Point
x: 5
y: 0
Enter data for Point c
Enter the data for the Point
x: 5
y: 5
12.5
12.5
```

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/lab/gr2
rohan@rohan-K53SV:~/projects/monsoon/java/course/lab/gr2$ java Test.Mainclass cl
Check for point or line is in a triangle or want to exit (1/2/3)
1
Enter the data for the Point
x: 2
y: 2
Check if is inside line or triangle or exit(1/2/3)
2
Enter data for Point a
Enter the data for the Point
x: 0
y: 0
Enter data for Point b
Enter the data for the Point
x: 0
y: 50
Enter data for Point c
Enter the data for the Point
x: 50
y: 0
1250.0
1250.0
true
Check for point or line is in a triangle or want to exit (1/2/3)
```