ENSF 409 Lab2 In Lab

Exercise1:


```
Drawing
+ lines: Line

- perimeter(polygon): double
+ DrawPolygon(Line): void
+ main(String): void
```

```
Polygon
- polygon: Line
- objID: int
- classID: int

+ Polygon(Line)
+ getLine(): Line
+ ClassID(): int
+ toString(): String
```

```
Line
+ start: Point
+ end: Point
- classID: int
- objID: int

+ distance(): double
+ toString(): String
+ Line()
```

```
Point
- y: int
- x: int

+ Point (int, int)
+ toString(): String
+ distance(): double
```
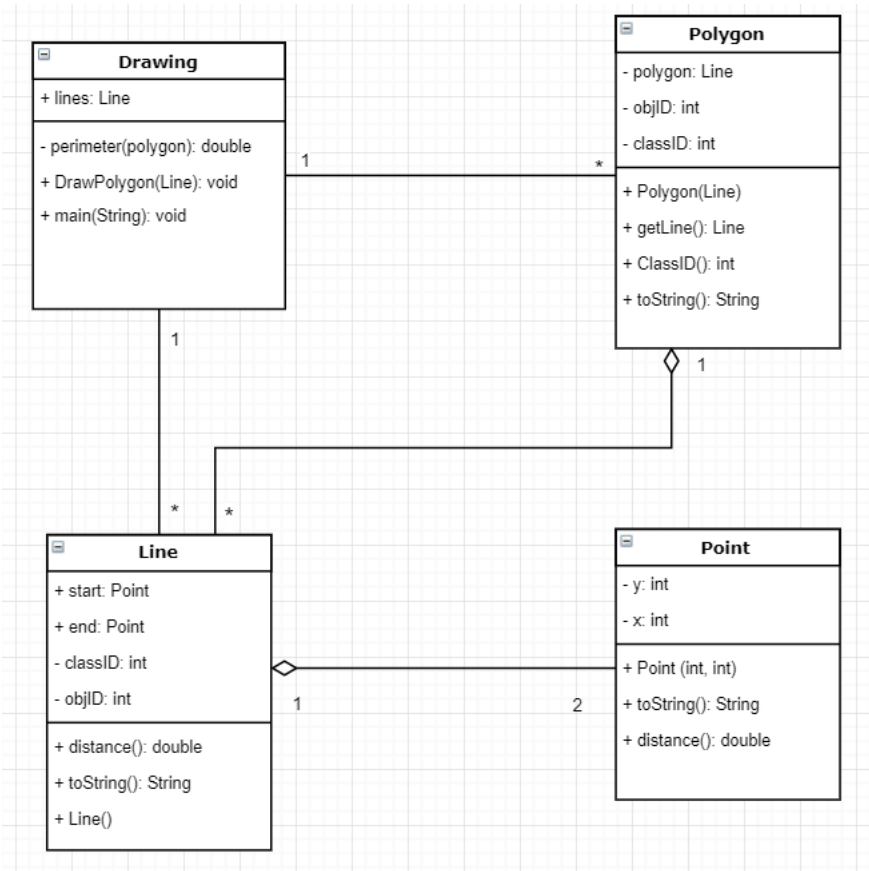
Exercise2:

```java
class Point {
      private int x, y;

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

      static public double distance(Point a, Point b){
            double diffx = a.x - b.x;
            double diffy = a.y - b.y;
            return Math.sqrt(diffx * diffx + diffy * diffy);
```

```java
        }

        public String toString(){
          String s = "(" + String.valueOf(x) + ", " + String.valueOf(y) + ")";
              return  s;
        }
}




class Line {

        Point start, end;
        private static int classID = 0;
        private int objID;

        public Line(Point a, Point b) {
                start = a;
                end = b;
                objID = ++ classID;
        }


        public double distance(){
            return Point.distance(start, end);
    }

    public String toString() {
        String s = "Line " + objID + ": starts at " + start.toString() + ", and ends
at " + end.toString() + "\n";
        return s;
    }
}




import java.util.*;

class Polygon {
        private final LinkedHashSet <Line> polygon;
        private int objID;
        private static int classID;
        Iterator <Line> it;

        public Polygon(LinkedHashSet<Line> polygon) {
                this.polygon = new LinkedHashSet<Line>();
                for(Line l: polygon)
                        this.polygon.add (l);
                objID = ++ classID;
                it = this.polygon.iterator();
        }

        public Iterator <Line> getLine() {
```

```java
            it = polygon.iterator();
            return it;
      }

      public static int classID(){
            return classID;
      }


        public String toString() {
            // THIS METHOD DOESN'T WORK. AS PART OF EXERCISE-2 STUDENTS MUST FIX
            // IT TO RETURN A STRING WITH THE INFORMATION ABOUT START AND END
            // POINTS OF N LINES OF A POLYGON. AS SHOWN IN THE EXAMPLE BELOW:
            // The lines in polygon 1 are:
            //    Line 1: starts at (20, 30), and ends at (50, 100)
            //    Line 2: starts at (50, 100), and ends at (100, 30)
            //    Line 3: starts at (100, 30), and ends at (20, 30)
            //

        String s = "The lines in polygon " + objID + " are: \n" + polygon.toString();


        return s;
      }
}
```

```
The lines in polygon 1 are:
[Line 1: starts at (20, 30), and ends at (50, 100)
, Line 2: starts at (50, 100), and ends at (105, 30)
, Line 3: starts at (105, 30), and ends at (20, 30)
]
The perimeter of the polygon 1 is 250.18:
The lines in polygon 2 are:
[Line 4: starts at (120, 130), and ends at (150, 200)
, Line 5: starts at (150, 200), and ends at (200, 130)
, Line 6: starts at (200, 130), and ends at (120, 130)
]
The perimeter of the polygon 2 is 242.18:
The lines in polygon 3 are:
[Line 7: starts at (320, 330), and ends at (250, 400)
, Line 8: starts at (250, 400), and ends at (400, 330)
, Line 9: starts at (400, 330), and ends at (320, 330)
]
The perimeter of the polygon 3 is 344.52:
```