REMARKS

1. ***GeometricObject , Rectangle & Hexagon is all compiling without any issue***
2. ***There are some minor issues with the Main Function***
3. ***All the required Functions and Exception Handling has been implemented***

//GeometricObject.java

```
import java.util.*;
import java.lang.*;


public abstract class GeometricObject  {

	private  double Area;
	private double Perimeter;



	public abstract double getArea();

	public abstract double getPerimeter();

	public abstract void getInfo();

	public static void max(ArrayList<GeometricObject> list , int position1 , int position2){

		if ( list.get(position1).getArea() > list.get(position2).getArea() )
			System.out.println("Object 1 has bigger Area");
		else if ( list.get(position1).getArea() < list.get(position2).getArea() )
			System.out.println("Object 2 has bigger Area");
		else
			System.out.println("Object 2 Area = Object 1 Area");

	}

}
```

//Rectangle.java

```
import java.util.*;
import java.lang.*;
import java.io.*;

public class Rectangle extends GeometricObject {

	private  double width;
	private double height;
```

```
	public double x1,y1,x2,y2,x3,y3,x4,y4;

	public double centerX ,centerY;




	public  Rectangle(double x1 , double y1 , double x2 , double y2 , double x3 , double y3 ,
double x4 ,double y4){

		double width1,width2,height1,height2;

		width1 = Distance(x1,y1,x2,y2);
		width2 = Distance(x3,y3,x4,y4);
		height1 = Distance(x1,y1,x4,y4);
		height2 = Distance(x2,y2,x3,y3);
	this.width=0;
	this.height=0;
	//Finding the center of the Rectangle
	this.centerX = (this.x1 + this . x2 + this.x3 + this.x4)/4;
		this.centerX = (this.y1 + this . y2 + this.y3 + this.y4)/4;

		if (width1==width2)
			this.width=width1;
		else System.out.println("Error , not a Rectangle because (the widths not equal)");

		if(height1==height2)
			this.height=height1;
		else System.out.println("Error , not a Rectangle because (the heights not equal)");

	}


	public int checkRect(){
		if (this.width!=0 && this.height!=0 )
			return 1;
		else return 0;

	}



	public  double getWidth(){
		return this.width;

	}

	public  double getHeight(){
		return this.height;
```

```
        }

        /** Return area */
  public double getArea() {return width * height; }

  /** Return perimeter */
  public double getPerimeter() {return 2 * (width + height);}

  public double Distance(double x1 ,double y1 ,double x2,double y2){
                double X = Math.pow( x1 - x2 ,2);
                double Y = Math.pow( y1 - y2 ,2);
                return Math.sqrt(X+Y);

        }









  public void getInfo(){
        System.out.println("x1=" + x1 + ",y1=" + y1);
        System.out.println("x2=" + x2 + ",y2=" + y2);
        System.out.println("x3=" + x3 + ",y3=" + y3);
        System.out.println("x4=" + x4 + ",y4=" + y4);
        System.out.println("Height=" + getHeight());
        System.out.println("Width =" + getWidth());
        System.out.println("Area=" + getArea());
        System.out.println("Perimeter=" + getPerimeter());
  }




}
```

//Hexagon.java

```
import java.util.*;
import java.lang.*;
import java.io.*;

public class Hexagon extends GeometricObject  {

   //Height is the total height of the Hexagon , ie distance between any two opposite corners
        private  double height;
        //Width is the lenght between any two opposite sides
        private double width;
        //Side is the length of the side of the hexagon
        private double side;
   //This stores the sides of the Hexagon
   public double x1,y1,x2,y2,x3,y3,x4,y4,x5,y5,x6,y6;
   //
        public Rectangle rect1 , rect2;




        public  Hexagon(double x1 , double y1 , double x2 , double y2 , double x3 , double y3 ,
double x4 ,double y4 , double x5 ,double y5 ,double x6 , double y6){

       this.x1 = x1;
       this.y1 = y1;
       this.x2 = x2;
       this.y2 = y2;
       this.x3 = x3;
       this.y3 = y3;
       this.x4 = x4;
       this.y4 = y4;

                rect1 = new Rectangle(x1,y1,x2,y2,x4,y4,x5,y5);
                rect2 = new Rectangle(x6,y6,x1,y1,x3,y3,x4,y4);

      // If the two Rectangles that form  the Hexagon has equal Height& width and same Center then
this will form a Hexagon
                if (rect1.checkRect()==1 && rect2.checkRect()==1 &&
rect1.getHeight()==rect2.getHeight() && rect1.getWidth()==rect2.getWidth() ){
                     if (rect1.centerX == rect2.centerX  && rect1.centerY == rect2.centerY ){
                    System.out.println("Valid Hexagon coordinates");
                    this.side = rect1.getHeight();}
                }

                else System.out.println("InValid Hexagon coordinates");
```

```
            this.width  = 2* Math.cos(30) * this.side;
            this.height = this.side + 2* Math.sin(30) * this.side;

        }



        public  double getWidthHex(){
            return this.width;

        }

        public  double getHeightHex(){
            return this.height;
        }

        /** Return area */
public double getArea() {return 9 * Math.pow(3 , .5) * Math.pow(this.side , 2); }

/** Return perimeter */
public double getPerimeter() {return 6 * this.side;}

public double Distance(double x1 ,double y1 ,double x2,double y2){
            double X = Math.pow( x1 - x2 ,2);
            double Y = Math.pow( y1 - y2 ,2);
            return Math.sqrt(X+Y);

        }









public void getInfo(){
        System.out.println("x1=" + x1 + ",y1=" + y1);
        System.out.println("x2=" + x2 + ",y2=" + y2);
        System.out.println("x3=" + x3 + ",y3=" + y3);
        System.out.println("x4=" + x4 + ",y4=" + y4);
        System.out.println("x5=" + x5 + ",y5=" + y5);
        System.out.println("x6=" + x6 + ",y6=" + y6);
        System.out.println("Height=" + getHeightHex());
        System.out.println("Width =" + getWidthHex());
        System.out.println("Area=" + getArea());
        System.out.println("Perimeter=" + getPerimeter());
}
```

```
}
```

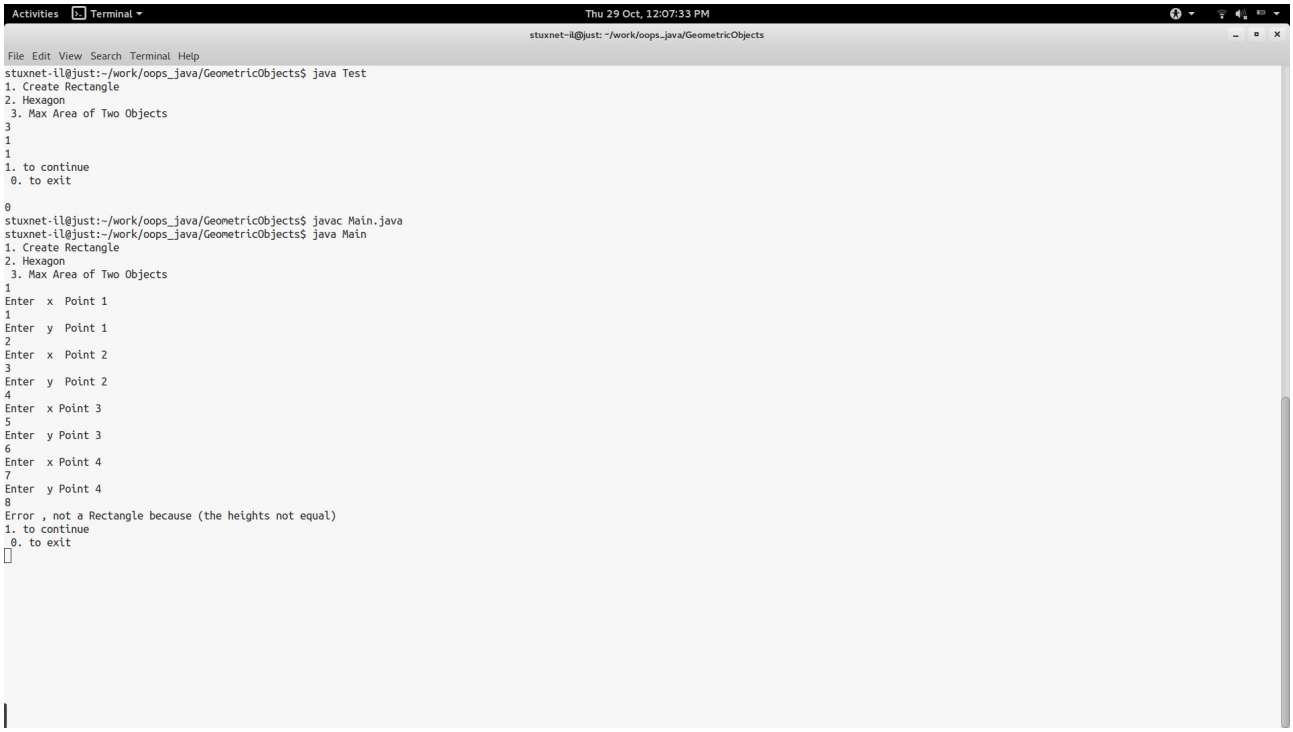
//Main.java

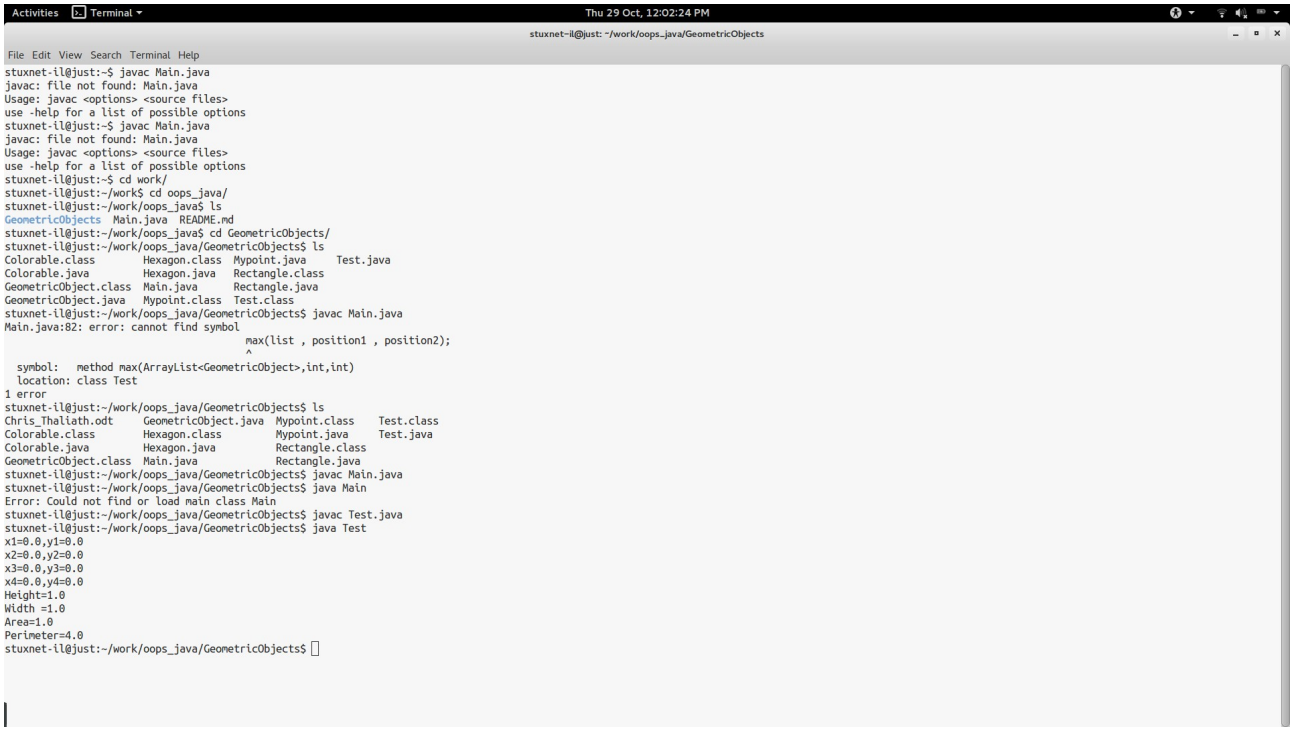
```
import java.util.*;
import java.io.*;
import java.lang.*;

class Test {


	public static void main(String args[]) {

		int option;

		int position;
		int choice;
		int count = 0;

		Scanner in = new Scanner(System.in);

		double x1,y1,x2,y2,x3,y3,x4,y4,x5,y5,x6,y6;
		ArrayList<GeometricObject> list = new ArrayList<GeometricObject>();



		do {
			System.out.println("1. Create Rectangle \n2. Hexagon \n 3. Max Area of Two
Objects");
			option = in.nextInt();

			switch(option) {
				case 1:
					System.out.println("Enter  x  Point 1");
						x1 = in.nextDouble();
					System.out.println("Enter  y  Point 1");
						y1 = in.nextDouble();
					System.out.println("Enter  x  Point 2");
						x2 = in.nextDouble();
					System.out.println("Enter  y  Point 2");
						y2 = in.nextDouble();
					System.out.println("Enter  x Point 3");
						x3 = in.nextDouble();
					System.out.println("Enter  y Point 3");
						y3 = in.nextDouble();
					System.out.println("Enter  x Point 4");
```

```
                                x4 = in.nextDouble();
                            System.out.println("Enter  y Point 4");
                                y4 = in.nextDouble();
                        list.add(new Rectangle(x1,y1,x2,y2,x3,y3,x4,y4));
                        count++;
                        break;
                case 2:

                            System.out.println("Enter  x  Point 1");
                                x1 = in.nextDouble();
                            System.out.println("Enter  y  Point 1");
                                y1 = in.nextDouble();
                            System.out.println("Enter  x  Point 2");
                                x2 = in.nextDouble();
                            System.out.println("Enter  y  Point 2");
                                y2 = in.nextDouble();
                            System.out.println("Enter  x Point 3");
                                x3 = in.nextDouble();
                            System.out.println("Enter  y Point 3");
                                y3 = in.nextDouble();
                            System.out.println("Enter  x Point 4");
                                x4 = in.nextDouble();
                            System.out.println("Enter  y Point 4");
                                y4 = in.nextDouble();
                            System.out.println("Enter  x Point 5");
                                x5 = in.nextDouble();
                            System.out.println("Enter  y Point 5");
                                y5 = in.nextDouble();
                            System.out.println("Enter  x Point 6");
                                x6 = in.nextDouble();
                            System.out.println("Enter  y Point 6");
                                y6 = in.nextDouble();
                        list.add(new Hexagon(x1,y1,x2,y2,x3,y3,x4,y4,x5,y5,x6,y6));
                        count++;
                        break;
                case 3:
                        printList(list , count );
                         int position1 = in.nextInt();
                         int position2 = in.nextInt();
                        //max(list , position1 , position2);




                        break;
            }

            System.out.println("1. to continue \n 0. to exit");
            choice = in.nextInt();
    }while (choice != 0);
```

```
        }

   public static void printList(ArrayList<GeometricObject> list , int  count ){
            for (int i = 0 ; i < count ; i++)
                    list.get(i).getInfo();


   }

}
```

ScreenShots




Activities
Terminal
Thu 29 Oct, 12:02:24 PM
stuxnet-il@just: ~/work/oops_java/GeometricObjects
File Edit View Search Terminal Help
stuxnet-il@just:~$ javac Main.java
javac: file not found: Main.java
Usage: javac <options> <source files>
use -help for a list of possible options
stuxnet-il@just:~$ javac Main.java
javac: file not found: Main.java
Usage: javac <options> <source files>
use -help for a list of possible options
stuxnet-il@just:~$ cd work/
stuxnet-il@just:~/work$ cd oops_java/
stuxnet-il@just:~/work/oops_java$ ls
GeometricObjects Main.java README.md
stuxnet-il@just:~/work/oops_java$ cd GeometricObjects/
stuxnet-il@just:~/work/oops_java/GeometricObjects$ ls
Colorable.class Hexagon.class Mypoint.java Test.java
Colorable.java Hexagon.java Rectangle.class
GeometricObject.class Main.java Rectangle.java
GeometricObject.java Mypoint.class Test.class
stuxnet-il@just:~/work/oops_java/GeometricObjects$ javac Main.java
Main.java:82: error: cannot find symbol
max(list , position1 , position2);
^
symbol: method max(ArrayList<GeometricObject>,int,int)
location: class Test
1 error
stuxnet-il@just:~/work/oops_java/GeometricObjects$ ls
Chris_Thaliath.odt GeometricObject.java Mypoint.class Test.class
Colorable.class Hexagon.class Mypoint.java Test.java
Colorable.java Hexagon.java Rectangle.class
GeometricObject.class Main.java Rectangle.java
stuxnet-il@just:~/work/oops_java/GeometricObjects$ javac Main.java
stuxnet-il@just:~/work/oops_java/GeometricObjects$ java Main
Error: Could not find or load main class Main
stuxnet-il@just:~/work/oops_java/GeometricObjects$ javac Test.java
stuxnet-il@just:~/work/oops_java/GeometricObjects$ java Test
x1=0.0,y1=0.0
x2=0.0,y2=0.0
x3=0.0,y3=0.0
x4=0.0,y4=0.0
Height=1.0
Width =1.0
Area=1.0
Perimeter=4.0
stuxnet-il@just:~/work/oops_java/GeometricObjects$