**Assignment 5**

**package** geometry;

**import** java.awt.geom.Point2D;

**import** java.lang.Object;

**import** java.util.ArrayList;

**import** java.awt.Polygon;

**public** **class** Poly **extends** Polygon{//declare a subclass, calling the methods from package Polygon

**public** Poly(**double**[] x, **double**[] y, **int** nPoints){//declare a constructor with the same format of Package Polygon

**super**();//call methods from Package Polygon

}

**public** **static** **void** main (String args[]){//declare the main method of this class

**double**[] x = **new** **double**[] {0.0,0.0,4.0};//declare an array. Put the horizontal coordinates of the polygon in it

**double**[] y = **new** **double**[] {0.0,4.0,0.0};//declare anther array. Put the vertical coordinates of the polygon in it

ArrayList<Segment> tester = **new** ArrayList<Segment>();//declare an arrayList. Put the test segments in it

Point2D testPt = **new** Point2D.Double(1.0,1.0);//declare an object test point. Initialize it.

Point2D endPt = **new** Point2D.Double(testPt.getX(), Double.***MAX\_VALUE***);//declare an object end point. It has same horizontal coordinate with the test point and any vertical coordinate

Segment Seg = **new** Segment (testPt, endPt);//declare an object segment with test point and end point

**int** nPoints = 3;//declare the number of the vertex of the polygon

**for** (**int** i = 0; i < nPoints ; i++) {

**for** (**int** j = 0; j < nPoints; j++) {

tester.add(**new** Segment(**new** Point2D.Double(x[i%nPoints], y[i%nPoints]), **new** Point2D.Double(x[(i+1)%nPoints], y[(i+1)%nPoints])));

}//I did not write this. It means 添加一个新的segment， segment是由连个array里一一对应的点组成的端点来计算的。%5:最后一个点和第一个点??

}

**int** counter = 0;//declare counter to calculate the number of intersections between the ray and the polygon

**for** (**int** i = 0; i < tester.size(); i++) {

**if** (Segment.*isIntersected*(Seg, tester.get(i)))

counter++;

}

**if** (counter%2 == 0) {//check if the number of intersection is odd or even number.

System.***out***.println("The point is in the polygon. ");

}

**else**

System.***out***.println("The point is NOT in the polygon. ");

**return**;

}

}