

LAB #19

ARRAYS

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This lab should be completed during the scheduled lab sessions. In order to complete this lab you must demonstrate programs to your lab TA. The technical knowledge on how to accomplish these tasks is found in the assigned reading or the lecture notes, but the lab TA will help as well.

1. Implement a class Polygon that contains an array list of Point2D.Double objects. Your class should support method
public void add (Point2D.Double aPoint)
public void draw(Graphics2D g2)
public double perimeter()
public double area()

Draw the polygon by joining adjacent points by a line, and then add a line to join the last point to the first point.

To compute the perimeter, compute distance between points and add them up.

To compute the area of a polygon with corners (x0,y0), (xn-1, yn-1) use:

$$(\frac{1}{2}) * (x_0y_1 + x_1y_2 + \dots + x_{n-1}y_0 - y_0x_1 - y_1x_2 - \dots - y_{n-1}x_0)$$

2. Lastly, write a JAVA applet that tests your Polygon class. The applet should have a greeting label and a single button to "add a point" when the user clicks on the button use a pop up to prompt for an x,y pair to add another corner to the polygon. Update the applet to show the new polygon and use labels to show the current perimeter and area.
3. Cut and paste your source code and screen shots of running code into your lab document and hand it in. Be sure to demo your running code to your TA so that the TA has a record of "checking you off" as having done this lab.

NOTE: Electronic hand in should be working at this point. Submit your lab work through the homework drop box in WebCT. However, if you encounter any problems, revert to paper based hand in.