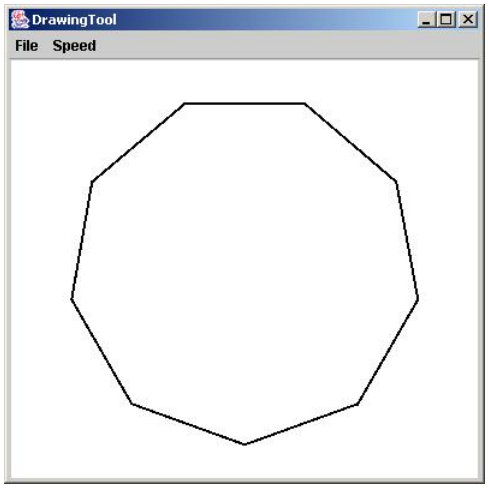
LAB EXERCISE

GraphicPolygon

Background:

In a previous lab exercise, we created a `RegularPolygon` class that maintained a large number of properties for any polygon of a given number and length of sides. By extending the `RegularPolygon` class to include the capabilities of the `DrawingTool` class, it is possible to display a graphic representation of any polygon. For example, a 9-sided regular polygon (nonagon) would be represented as follows:



Assignment:

1. Extend the `RegularPolygon` class created in lab L.A.7.1 to create a `GraphicPolygon` class. Use the following declarations as a starting point for your lab work.

```
class GraphicPolygon extends RegularPolygon
{
  private DrawingTool pen = new DrawingTool(new SketchPad(400, 400));
  private double xPosition, yPosition;

  // constructors

  // Initializes a polygon of numSides sides and sideLength
  //   length in the superclass. The polygon is centered at
  //   xPosition = yPosition = 0
  public GraphicPolygon(int numSides, double sideLength)
  {
  }

  // Initializes a polygon of numSides sides and sideLength
  //   length in the superclass. The polygon is centered at
  //   xPosition = x and yPosition = y
  public GraphicPolygon(int numSides, double sideLength, double x, double y)
  {
  }
```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```
    // public methods

    // Sets xPosition = x and yPosition = y to correspond to the new
    //   center of the polygon
    public void moveTo(double x, double y)
    {
    }

    // Draws the polygon about the center point (xPosition, yPosition).
    // Uses properties inherited from RegularPolygon to determine the
    //   number and length of the sides, the radius of the inscribed circle,
    //   and the vertex angle with which to draw the polygon
    public void draw()
    {
    }
}
```

2. Write two constructor methods. The first constructor initializes the number and length of the sides of a polygon centered about the point (0, 0). The Second constructor is used to initialize a polygon a specified number and length of sides with a center at a specified x and y location.

3. Write a method that draws the polygon onto the `Sketchpad` window using the movement and drawing methods available in the `DrawingTool` class.

4. Write a method that moves the center of the polygon to a specified `x` and `y` location.

5. Write a testing class with a `main()` method that constructs a `GraphicPolygon` and calls each method. Sample usage for a polygon with 9 sides of length 100 would give:

```
GraphicPolygon gPoly = new GraphicPolygon(9, 100);
gPoly.draw();
```

Instructions:

1. Use the following values to test your functions:

   Square: number of sides = 4, length of side = 150
   Octagon: number of sides = 8, length of side = 100
   Enneadecagon: number of sides = 19, length of side = 50
   Enneacontakaihenagon: number of sides = 91, length of side = 10

2. Run the testing class and call your instructor to your workspace for scoring.

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