



```
// Star Program
```

```
import java.awt.Graphics;  
import java.applet.Applet;  
import java.util.Arrays;  
import java.util.Random;  
import java.lang.Math;  
import java.awt.Color;  
import java.awt.Graphics2D;  
import java.awt.BasicStroke;
```

```
public class Star extends Applet {
```

```
    public void paint(Graphics g) {
```

```
        setSize(1000, 650);
```

```
        // set random radius
```

```
        // choose point with an initial angle of 36 degrees
```

```
        Random rand = new Random();
```

```
        for (int j = 0; j < 10; j++) {
```

```

int outerRadius = rand.nextInt(150) + 70;
int innerRadius = (int) (0.4 * outerRadius);

int shiftX = rand.nextInt(700) + 100;
int shiftY = rand.nextInt(500) + 50;

double angle = 36;
double initialXInner = Math.cos(Math.toRadians(angle)) * innerRadius;
double initialYInner = Math.sin(Math.toRadians(angle)) * innerRadius;
double newX = 0;
double newY = 0;

int[] xCoordinates = new int[10];
int[] yCoordinates = new int[10];

for (int i = 1; i < xCoordinates.length; i = i + 2) {
    angle = angle + 72;
    newX = (Math.cos(Math.toRadians(angle)) * innerRadius) + shiftX;
    newY = (Math.sin(Math.toRadians(angle)) * innerRadius) + shiftY;
    xCoordinates[i] = (int) newX;
    yCoordinates[i] = (int) newY;
    //System.out.println(angle);
}

angle = 0;

for (int i = 0; i < xCoordinates.length; i = i + 2) {
    angle = angle + 72;
    newX = (Math.cos(Math.toRadians(angle)) * outerRadius) + shiftX;
    newY = (Math.sin(Math.toRadians(angle)) * outerRadius) + shiftY;
    xCoordinates[i] = (int) newX;
    yCoordinates[i] = (int) newY;
    //System.out.println(angle);
}

//Array for testing coordinates
int[] printArray = new int[2];
for (int i = 0; i < 10; i++) {
    printArray[0] = xCoordinates[i];
    printArray[1] = yCoordinates[i];
    //System.out.println(Arrays.toString(printArray));
}

//Coloring the stars
//Graphics2D required to set line thickness
Graphics2D g2d = (Graphics2D) g;

```

```
int redFill = rand.nextInt(256);
int greenFill = rand.nextInt(256);
int blueFill = rand.nextInt(256);
Color colorFill = new Color(redFill, greenFill, blueFill);
g.setColor(colorFill);

g.fillPolygon(xCoordinates, yCoordinates, 10);

int redBorder = rand.nextInt(256);
int greenBorder = rand.nextInt(256);
int blueBorder = rand.nextInt(256);
Color colorBorder = new Color(redBorder, greenBorder, blueBorder);
g.setColor(colorBorder);
g2d.setStroke(new BasicStroke(5)); //set line thickness to 5

g.drawPolygon(xCoordinates, yCoordinates, 10);
}
}
}
```