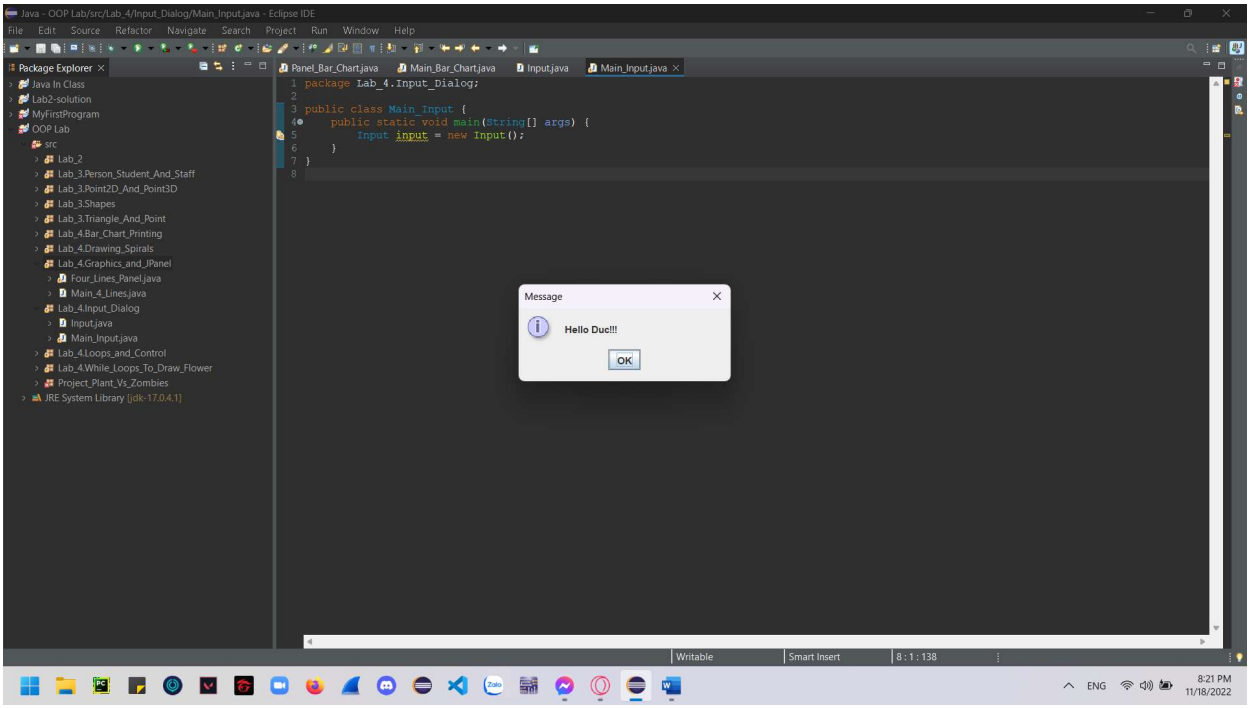
NGUYỄN MINH ĐỨC – ITITIU21045

Q1.

```java
import javax.swing.JOptionPane;

public class Input {
	String name = JOptionPane.showInputDialog("What is your name?");
	public Input() {
		JOptionPane.showMessageDialog(null, "Hello "+name+"!!!");
	}
}
```

```java
public class Main_Input {
	public static void main(String[] args) {
		Input input = new Input();
	}
}
```



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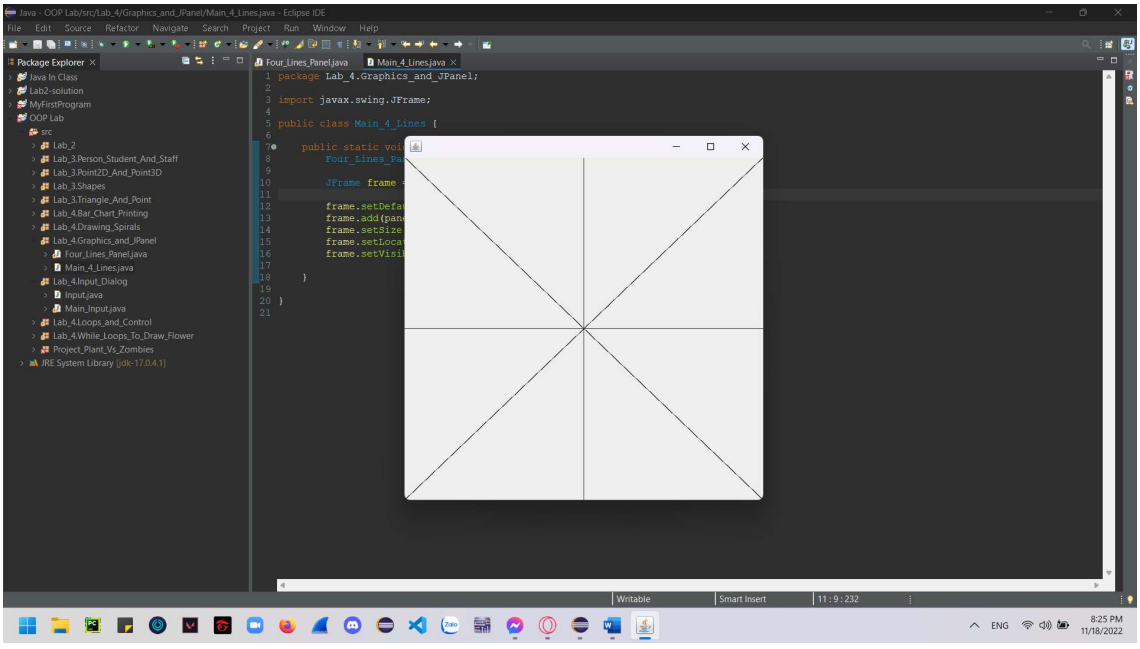
Q2.

```java
import java.awt.Graphics;
import java.awt.Graphics2D;
import javax.swing.JPanel;

public class Four_Lines_Panel extends JPanel{
	Four_Lines_Panel(){

	}

	public void paint(Graphics g) {
		Graphics2D g2D = (Graphics2D) g;
		int width = getSize().width;
		int height = getSize().height;
		g2D.drawLine(0, 0, width, height);
		g2D.drawLine(0, height, width, 0);
		g2D.drawLine(width/2, 0, width/2, height);
		g2D.drawLine(0, height/2, width, height/2);
	}
}
```

```java
import javax.swing.JFrame;

public class Main_4_Lines {

	public static void main(String[] args) {
		Four_Lines_Panel panel = new Four_Lines_Panel();

		JFrame frame = new JFrame();

		frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
		frame.add(panel);
		frame.setSize(500,500);
		frame.setLocationRelativeTo(null);
		frame.setVisible(true);

	}

}
```

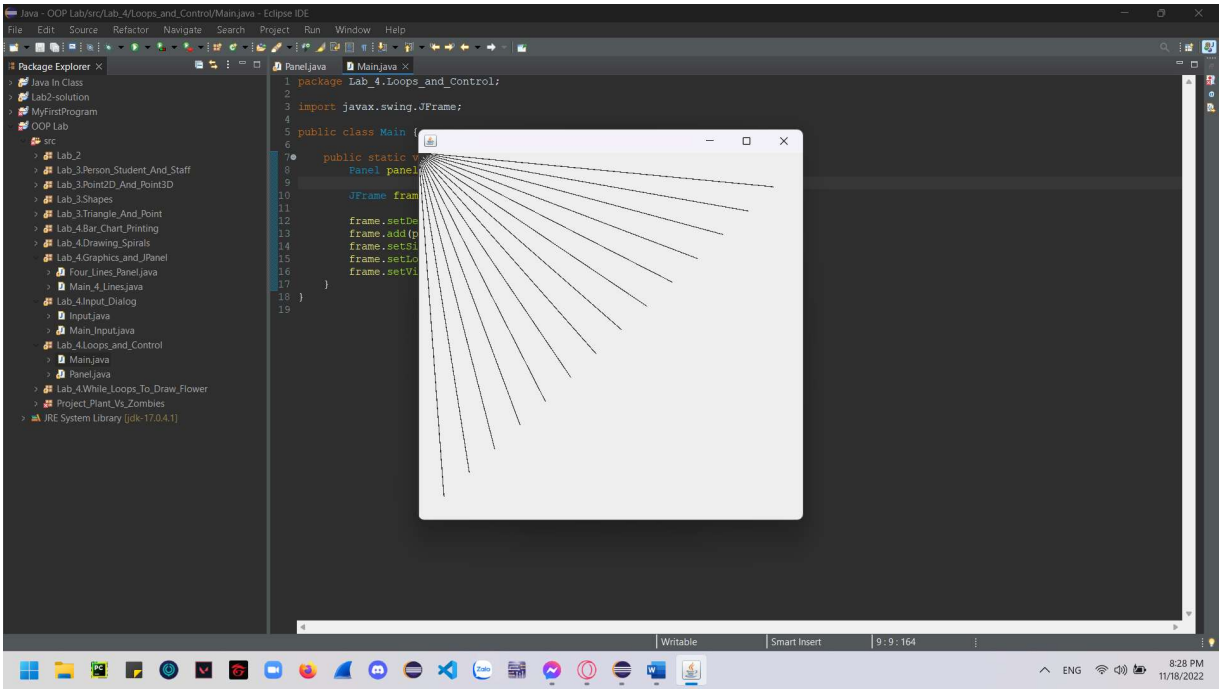


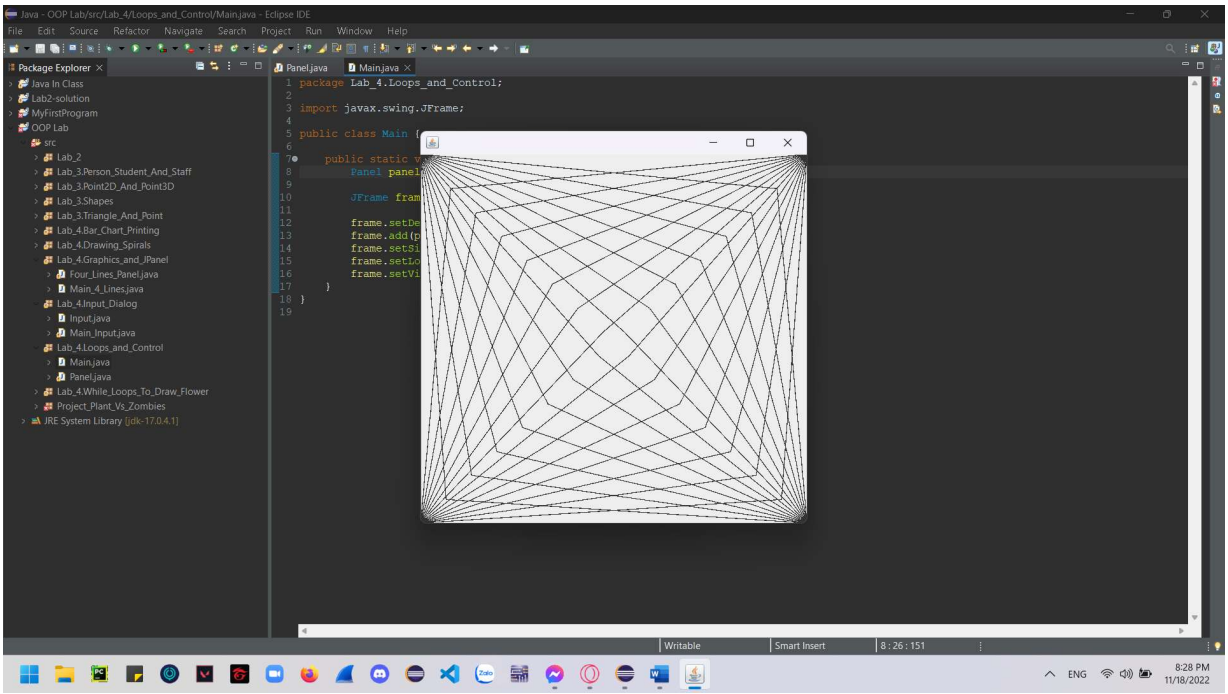
Q3.

```
import java.awt.Graphics;
import java.awt.Graphics2D;
import javax.swing.JPanel;

public class Panel extends JPanel{

	Panel(){

	}

	public void paint(Graphics g) {
		Graphics2D g2D = (Graphics2D) g;
		int width = getSize().width;
		int height = getSize().height;
		/*a)
		int endpoint_x=0;
		int endpoint_y=height;
		for (int i=0;i<15;i++) {
			g2D.drawLine(0, 0, endpoint_x, endpoint_y);
			endpoint_x += width/15;
			endpoint_y -= height/15;
		}
		*/


		//b)
		int endpoint1_x=0;
		int endpoint1_y=height;
		for (int i=0;i<15;i++) {
			g2D.drawLine(0, 0, endpoint1_x, endpoint1_y);
			endpoint1_x += width/15;
			endpoint1_y -= height/15;
		}

		int endpoint2_x=width;
		int endpoint2_y=height;
		for (int i=0;i<15;i++) {
			g2D.drawLine(0, height, endpoint2_x, endpoint2_y);
			endpoint2_x -= width/15;
			endpoint2_y -= height/15;
		}

		int endpoint3_x=width;
		int endpoint3_y=height;
		for (int i=0;i<15;i++) {
			g2D.drawLine(width, 0, endpoint3_x, endpoint3_y);
			endpoint3_x -= width/15;
			endpoint3_y -= height/15;
		}

		int endpoint4_x=0;
		int endpoint4_y=height;
		for (int i=0;i<15;i++) {
			g2D.drawLine(width, height, endpoint4_x, endpoint4_y);
			endpoint4_x += width/15;
			endpoint4_y -= height/15;
		}

	}
}
```

```
import javax.swing.JFrame;
```

```java
public class Main {

	public static void main(String[] args) {
		Panel panel = new Panel();

		JFrame frame = new JFrame();

		frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
		frame.add(panel);
		frame.setSize(500,500);
		frame.setLocationRelativeTo(null);
		frame.setVisible(true);
	}
}
```





Q4.

```
import java.awt.Graphics;
import java.awt.Graphics2D;
import javax.swing.JPanel;

public class Panel_While extends JPanel{
	Panel_While(){

	}

	public void paint(Graphics g) {
		Graphics2D g2D = (Graphics2D) g;
		int width = getSize().width;
		int height = getSize().height;
		/* a)
		int i = 0;
		int startpoint_x=0;
		int startpoint_y=0;
		int endpoint_x=width/15;
		int endpoint_y=height;
		while (i<15) {
			g2D.drawLine(startpoint_x, startpoint_y, endpoint_x, endpoint_y);
			startpoint_y += height/15;
			endpoint_x += width/15;

			i++;
		}
		*/

		// b)
		int i = 0;
		int startpoint1_x=0;
		int startpoint1_y=0;
		int endpoint1_x=width/15;
		int endpoint1_y=height;
		while (i<15) {
			g2D.drawLine(startpoint1_x, startpoint1_y, endpoint1_x, endpoint1_y);
			startpoint1_y += height/15;
			endpoint1_x += width/15;

			i++;
		}

		int j = 0;
		int startpoint2_x=0;
		int startpoint2_y=height;
		int endpoint2_x=width/15;
		int endpoint2_y=0;
		while (j<15) {
			g2D.drawLine(startpoint2_x, startpoint2_y, endpoint2_x, endpoint2_y);
			startpoint2_y -= height/15;
			endpoint2_x += width/15;
```

```
                        j++;
                }

                int k = 0;
                int startpoint3_x=width;
                int startpoint3_y=0;
                int endpoint3_x=width-width/15;
                int endpoint3_y=height;
                while (k<15) {
                        g2D.drawLine(startpoint3_x, startpoint3_y, endpoint3_x, endpoint3_y);
                        startpoint3_y += height/15;
                        endpoint3_x -= width/15;

                        k++;
                }

                int l = 0;
                int startpoint4_x=width;
                int startpoint4_y=height;
                int endpoint4_x=width-width/15;
                int endpoint4_y=0;
                while (l<15) {
                        g2D.drawLine(startpoint4_x, startpoint4_y, endpoint4_x, endpoint4_y);
                        startpoint4_y -= height/15;
                        endpoint4_x -= width/15;

                        l++;
                }
        }
}
```

```
import javax.swing.JFrame;

public class Main_While {
      public static void main(String[] args) {
            Panel_While panel = new Panel_While();

            JFrame frame = new JFrame();

            frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
            frame.add(panel);
            frame.setSize(500,500);
            frame.setLocationRelativeTo(null);
            frame.setVisible(true);
      }
}
```

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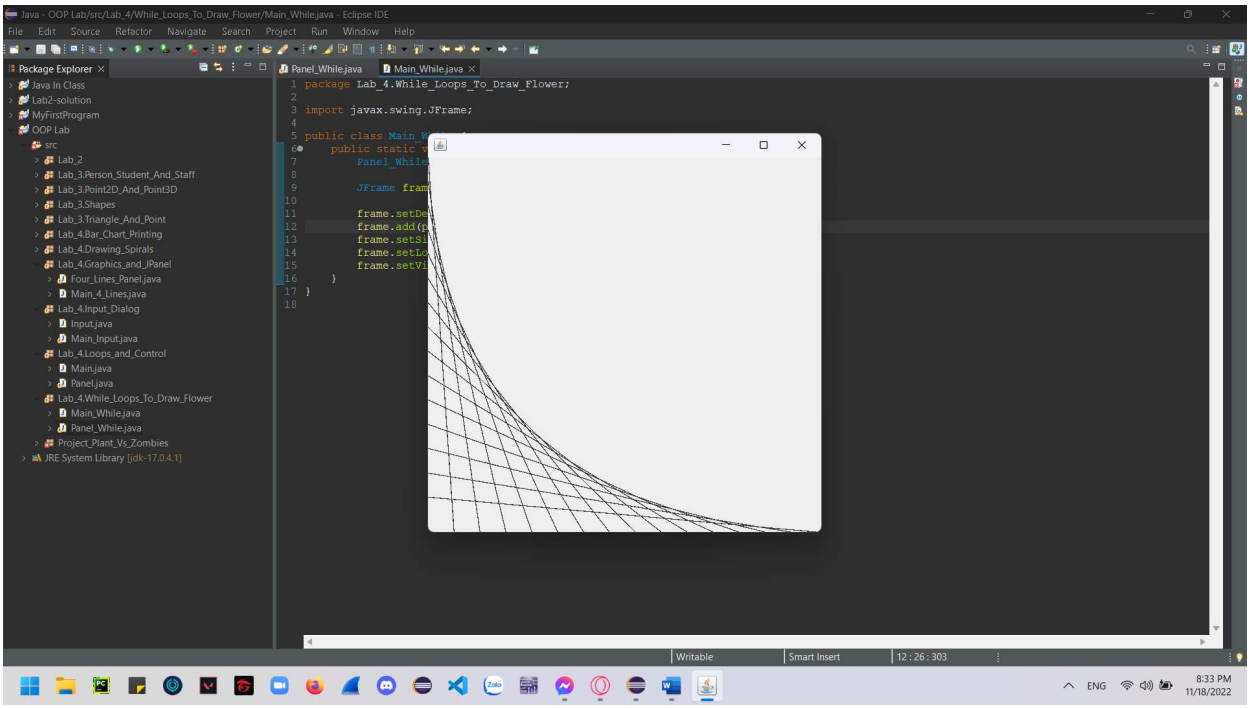
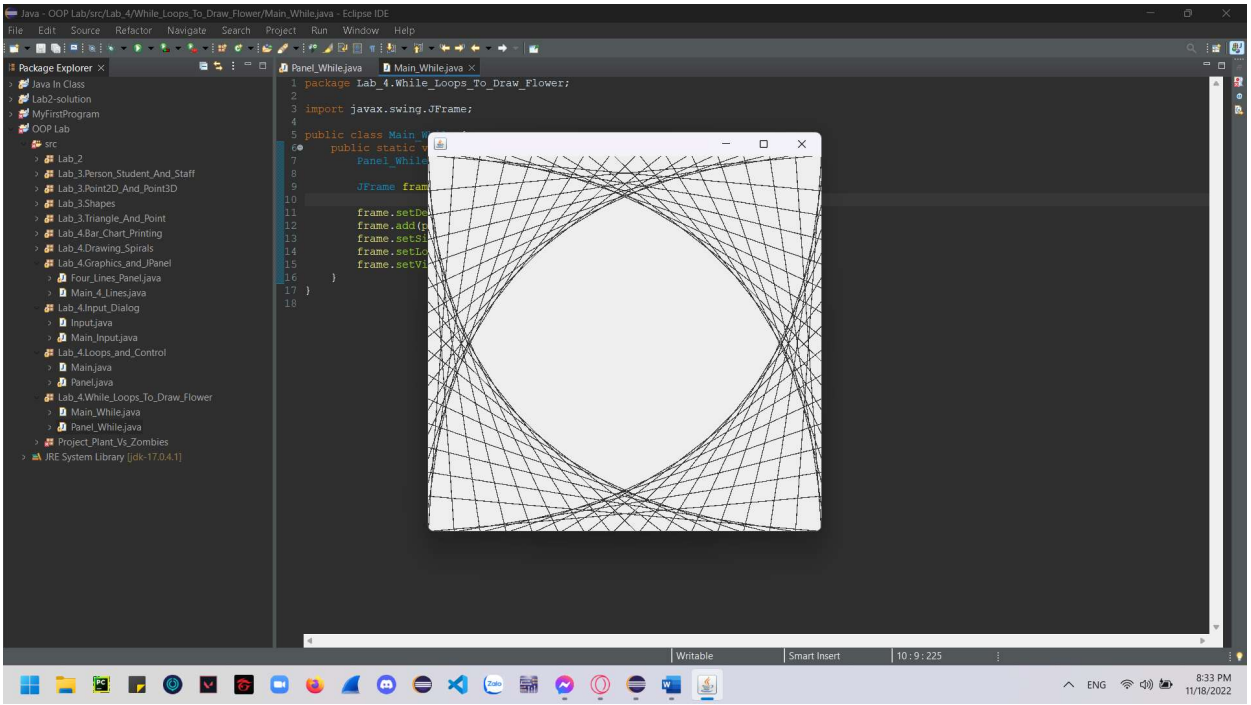


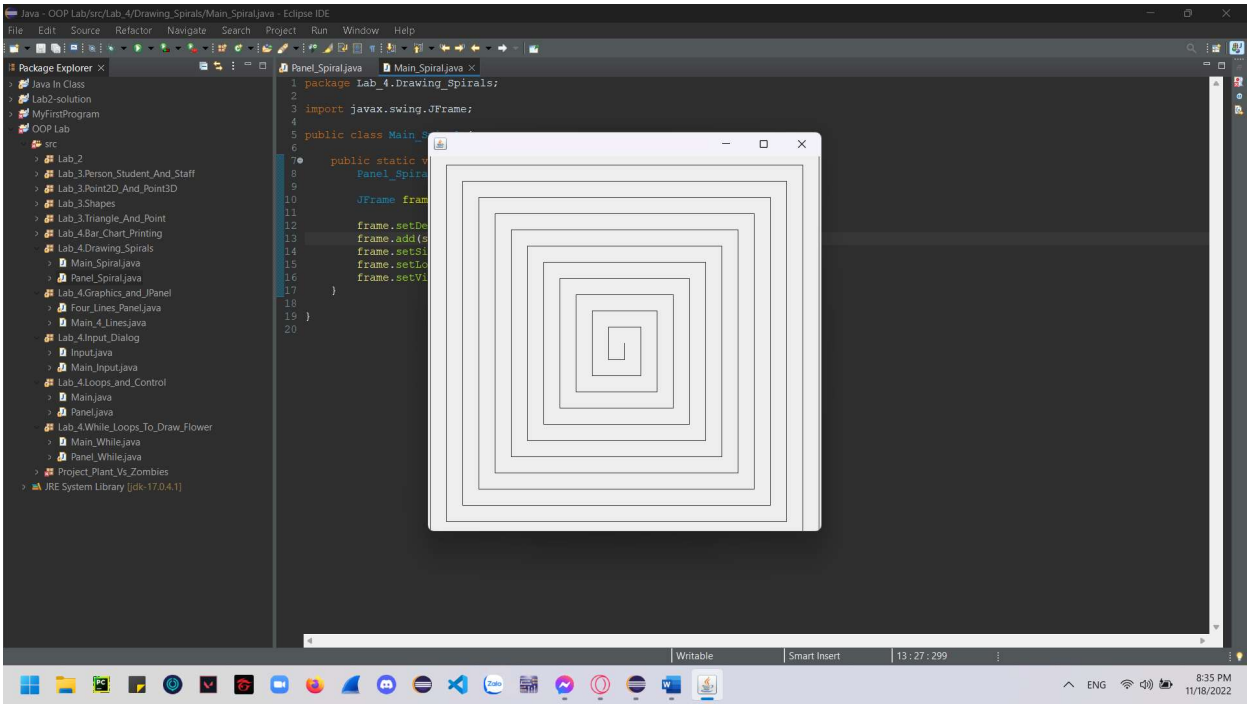


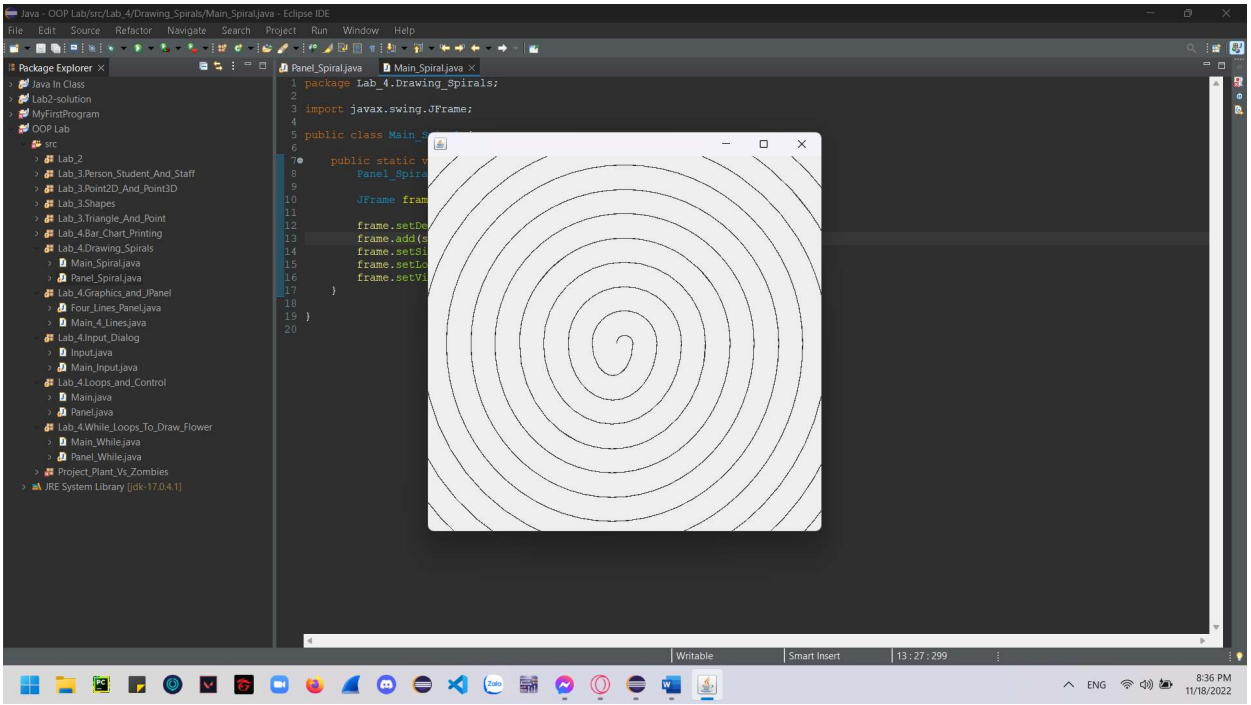
Q5.

```
import java.awt.Graphics;
import java.awt.Graphics2D;
import javax.swing.JPanel;

public class Panel_Spiral extends JPanel{
	Panel_Spiral(){

	}

	public void paint(Graphics g) {
		Graphics2D g2D = (Graphics2D) g;
		int width = getSize().width;
		int height = getSize().height;
		int widthCenter = width/2;
		int heightCenter = height/2;
		/* a)
		for(int i=0; i<width; i++) {
			g2D.drawLine(widthCenter + (20 * i), heightCenter - (20 * i), widthCenter + (20 * i), heightCenter + 20 + (20 * i));
			g2D.drawLine(widthCenter + (20 * i), heightCenter + 20 + (20 * i), widthCenter - 20 - (20 * i), heightCenter + 20 + (20*i));
			g2D.drawLine(widthCenter - 20 - (20 * i), heightCenter + 20 + (20 * i), widthCenter - 20 - (20 * i), heightCenter - 20 - (20 * i));
			g2D.drawLine(widthCenter - 20 - (20 * i), heightCenter - 20 - (20 * i), widthCenter + 20 + (20 * i), heightCenter - 20 - (20 * i));
		}
		*/
		// b)
		int arcGrowDelta = 30;
		int arcWidth = 10;

		for(int k=0; k<width; k++) {
			g2D.drawArc(widthCenter - arcWidth, heightCenter - arcWidth, 2 * arcWidth, 2 * arcWidth, 0, 180);
			arcWidth += arcGrowDelta;
			g2D.drawArc(widthCenter - arcWidth, heightCenter - arcWidth, 2 * arcWidth - arcGrowDelta, 2 * arcWidth, 180, 180);
			}
		}
}
```

```
import javax.swing.JFrame;

public class Main_Spiral {

	public static void main(String[] args) {
		Panel_Spiral spiral = new Panel_Spiral();

		JFrame frame = new JFrame();

		frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
		frame.add(spiral);
		frame.setSize(500,500);
```

```
                frame.setLocationRelativeTo(null);
                frame.setVisible(true);
        }

}
```





Q6.

```
import javax.swing.JPanel;

import java.awt.Color;
import java.awt.Dimension;
import java.awt.Graphics;

public class Panel_Bar_Chart extends JPanel{
	private double[] values;
	Panel_Bar_Chart(double[] values){
		this.values = values;
	}

	private Color[] color = new Color[5];

	protected void paintComponent(Graphics g) {
		super.paintComponent(g);
		Dimension d = getSize();
		color[0] = Color.black;
		color[1] = Color.blue;
		color[2] = Color.red;
		color[3] = Color.pink;
		color[4] = Color.cyan;
		int barHeight = getHeight()/5-50;
		int valueY = 20;
		for (int i = 0; i<values.length; i++) {
			int barWidth = ((int)(values[i]))*10;
			g.setColor(color[i]);
			g.fillRect(10, valueY, barWidth, barHeight);
			g.setColor(Color.black);
			g.drawRect(10, valueY, barWidth, barHeight);
			valueY += barHeight+50;
		}
	}

}
```

```
import java.awt.Color;

import javax.swing.JFrame;
import javax.swing.JOptionPane;

public class Main_Bar_Chart {
	public static void main(String[] args) {
		JFrame frame = new JFrame("Bar Chart");
		String num1 = JOptionPane.showInputDialog("Enter the length of bar 1");
		String num2 = JOptionPane.showInputDialog("Enter the length of bar 2");
		String num3 = JOptionPane.showInputDialog("Enter the length of bar 3");
		String num4 = JOptionPane.showInputDialog("Enter the length of bar 4");
		String num5 = JOptionPane.showInputDialog("Enter the length of bar 5");
		double[] values = new double[5];
		values[0] = Integer.parseInt(num1);
```

```
                values[1] = Integer.parseInt(num2);
                values[2] = Integer.parseInt(num3);
                values[3] = Integer.parseInt(num4);
                values[4] = Integer.parseInt(num5);
                frame.setSize(400, 300);
                frame.getContentPane().add(new Panel_Bar_Chart(values));
                frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
                frame.pack();
                frame.setLocationRelativeTo(null);
                frame.setVisible(true);
        }
}
```