[1]

```
public class Q1 {
   public static void main(String[] args) {

      JFrame f1 = new JFrame();

      f1.setSize(300, 300);
      f1.setTitle("My First Frame");
      f1.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      f1.setLocationRelativeTo(null);

      f1.setVisible(true);

   }
}
```

[2]

```
import javax.swing.*;
import java.awt.*;

public class Q2 {
   public static void main(String[] args) {
      JFrame frame = new JFrame("Border Layout Window");
      frame.setSize(300, 300);
      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.setLayout(new BorderLayout());

      frame.add(new JButton("Button1"), BorderLayout.NORTH);
      frame.add(new JButton("Button2"), BorderLayout.SOUTH);
      frame.add(new JButton("Button3"), BorderLayout.EAST);
      frame.add(new JButton("Button4"), BorderLayout.WEST);
      frame.add(new JButton("Button5"), BorderLayout.CENTER);

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

[3]

```
import javax.swing.*;
import java.awt.*;

public class Q3 {
```

```
  public static void main(String[] args) {
    JFrame frame = new JFrame("Border Layout Window");
    frame.setSize(400, 200);
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    JLabel northLabel = new JLabel("North Label", JLabel.CENTER);
    JLabel southLabel = new JLabel("South Label", JLabel.CENTER);

    frame.add(northLabel, BorderLayout.NORTH);
    frame.add(southLabel, BorderLayout.SOUTH);

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

[4]

```
import javax.swing.*;
import java.awt.*;

public class Q4 {
  public static void main(String[] args) {
    JFrame frame = new JFrame("Border Layout Window");
    frame.setSize(400, 200);
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    JLabel northLabel = new JLabel("North Label", JLabel.CENTER);
    JLabel southLabel = new JLabel("South Label", JLabel.CENTER);

    northLabel.setFont(new Font("", Font.BOLD, 30));
    southLabel.setFont(new Font("", Font.BOLD, 30));

    frame.add(northLabel, BorderLayout.NORTH);
    frame.add(southLabel, BorderLayout.SOUTH);

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

[5]

```
import javax.swing.*;
import java.awt.*;

public class Q5 {
```

```
  public static void main(String[] args) {
    JFrame frame = new JFrame("FlowLayout Example");
    frame.setSize(300, 200);
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    frame.setLayout(new FlowLayout());

    frame.add(new JButton("Button1"));
    frame.add(new JButton("Button2"));
    frame.add(new JButton("Button3"));
    frame.add(new JButton("Button4"));

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

[6]

```
import javax.swing.*;
import java.awt.*;

public class Q6 {
  public static void main(String[] args) {
    JFrame frame = new JFrame("Left Alignment FlowLayout");
    frame.setSize(300, 200);
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    frame.setLayout(new FlowLayout(FlowLayout.LEFT));

    frame.add(new JButton("Button1"));
    frame.add(new JButton("Button2"));
    frame.add(new JButton("Button3"));
    frame.add(new JButton("Button4"));

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

[7]

```
import javax.swing.*;
import java.awt.*;
```

```
public class Q7 {
   public static void main(String[] args) {
      JFrame frame = new JFrame("Right Alignment FlowLayout");
      frame.setSize(300, 200);
      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.setLayout(new FlowLayout(FlowLayout.RIGHT));

      frame.add(new JButton("Button1"));
      frame.add(new JButton("Button2"));
      frame.add(new JButton("Button3"));
      frame.add(new JButton("Button4"));

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

[8]

```
import javax.swing.*;
import java.awt.*;

public class Q8 {
   public static void main(String[] args) {
      JFrame frame = new JFrame("GridLayout Example");
      frame.setSize(300, 200);
      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.setLayout(new GridLayout(2, 2));

      frame.add(new JButton("Button1"));
      frame.add(new JButton("Button2"));
      frame.add(new JButton("Button3"));
      frame.add(new JButton("Button4"));

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

[10]

The new MyFrame().setVisible(true); statement does not display the panel properly because JPanel itself is not a top-level container like JFrame.

[12]

MyFrame extends JFrame, making it a top-level container.

A JPanel named buttonPanel is created. By default, it uses a FlowLayout, which arranges components left to right.

Three JButton components are added to the buttonPanel.

The buttonPanel is added to the JFrame using the add method, which places it in the center of the frame because the default layout for JFrame is BorderLayout.

The mixing of layout managers allows complex GUI structures where different parts of the window use different layouts.

[13]

```
import javax.swing.*;
import java.awt.*;

public class CalculatorUI extends JFrame {
   public CalculatorUI() {
      setTitle("Calculator");
      setSize(400, 400);
      setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      setLayout(new BorderLayout());

      JPanel displayPanel = new JPanel();
      JTextField display = new JTextField(20);
      display.setHorizontalAlignment(JTextField.RIGHT);
      displayPanel.add(display);
      add(displayPanel, BorderLayout.NORTH);
```

```
        JPanel buttonPanel = new JPanel();
        buttonPanel.setLayout(new GridLayout(4, 4));

        String[] buttons = {
            "7", "8", "9", "/",
            "4", "5", "6", "*",
            "1", "2", "3", "-",
            "0", ".", "=", "+"
        };

        for (String text : buttons) {
            buttonPanel.add(new JButton(text));
        }

        add(buttonPanel, BorderLayout.CENTER);
    }

    public static void main(String[] args) {
        new CalculatorUI().setVisible(true);
    }
}
```

[14]

The frame is titled "Calculator" and uses a FlowLayout, which arranges components in a row, centering them.

It contains two text fields (num1textField and num2textField) for user input, an operator label (operatorLabel), an equals button (equalsButton), and an answer label (answerLabel).

These components are added sequentially, creating a simple calculator interface layout.

[15]

a small window appears with the text label positioned at the top.

[16]

a window appears with the label text and the icon, positioned at the top.

[18]

a window appears with a combo box displaying these colors as selectable items.

[21]

A toggle button is a GUI component that acts like a switch between two states: on and off. In the provided example, a JToggleButton is used, which allows the user to switch between "Yes" and "No". The purpose of this button is to let the user make a binary choice. Here, the button starts in the "Yes" state because true is passed as the second argument to the constructor.

[22]

```
import java.awt.*;
import javax.swing.*;

class MyFrame extends JFrame {
   private JComboBox<String> colourBox;

   MyFrame() {
      setSize(300, 200);
      setDefaultCloseOperation(EXIT_ON_CLOSE);
      setTitle("JComboBox Example");
      setLayout(new FlowLayout());

      // Initialize the JComboBox with color options
      colourBox = new JComboBox<>(new String[] { "RED", "GREEN", "BLACK", "BLUE" });
```

```
        // Add the JComboBox to the frame
        add(colourBox);
    }
}

class Demo {
    public static void main(String args[]) {
        new MyFrame().setVisible(true);
    }
}
```

[23]

```
import java.awt.*;
import javax.swing.*;

class MyFrame extends JFrame {
    private JCheckBox plainCheckBox, boldCheckBox, italicCheckBox;

    MyFrame() {
        setSize(300, 200);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setTitle("JCheckBox Example");
        setLayout(new FlowLayout());

        // Initialize checkboxes
        plainCheckBox = new JCheckBox("Plain", true);  // Default selected
        boldCheckBox = new JCheckBox("Bold");
        italicCheckBox = new JCheckBox("Italic");
```

```
        // Add checkboxes to the frame
        add(plainCheckBox);
        add(boldCheckBox);
        add(italicCheckBox);
    }
}

class Demo {
    public static void main(String args[]) {
        new MyFrame().setVisible(true);
    }
}
```

[24]

```
import java.awt.*;
import javax.swing.*;

class MyFrame extends JFrame {
    private JComboBox<String> monthComboBox, yearComboBox;
    private JComboBox<Integer> dayComboBox;

    MyFrame() {
        setSize(300, 200);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setTitle("Date Picker Example");
        setLayout(new FlowLayout());

        // Initialize day, month, and year combo boxes
        Integer[] days = new Integer[31];
        for (int i = 0; i < 31; i++) {
```

```
        days[i] = i + 1;
      }
      dayComboBox = new JComboBox<>(days);
      dayComboBox.setSelectedItem(6);

      String[] months = {"January", "February", "March", "April", "May", "June", "July", "August",
"September", "October", "November", "December"};
      monthComboBox = new JComboBox<>(months);
      monthComboBox.setSelectedIndex(3);  // April
      monthComboBox.setMaximumRowCount(4);

      String[] years = {"2010", "2011", "2012", "2013", "2014", "2015"};
      yearComboBox = new JComboBox<>(years);
      yearComboBox.setSelectedItem("2013");

      // Add combo boxes to the frame
      add(dayComboBox);
      add(monthComboBox);
      add(yearComboBox);
   }
}

class Demo {
   public static void main(String args[]) {
      new MyFrame().setVisible(true);
   }
}
```

[25]

```
import java.awt.*;
```

```
import javax.swing.*;

class Equalizer extends JFrame {
   private JSlider bassSlider, midSlider, trebleSlider;

   Equalizer() {
      setSize(400, 300);
      setDefaultCloseOperation(EXIT_ON_CLOSE);
      setTitle("Equalizer");
      setLayout(new GridLayout(3, 2));

      // Initialize sliders
      bassSlider = new JSlider(0, 100, 50);
      bassSlider.setMajorTickSpacing(10);
      bassSlider.setPaintTicks(true);
      bassSlider.setPaintLabels(true);

      midSlider = new JSlider(0, 100, 50);
      midSlider.setMajorTickSpacing(10);
      midSlider.setPaintTicks(true);
      midSlider.setPaintLabels(true);

      trebleSlider = new JSlider(0, 100, 50);
      trebleSlider.setMajorTickSpacing(10);
      trebleSlider.setPaintTicks(true);
      trebleSlider.setPaintLabels(true);

      // Add sliders and labels to the frame
      add(new JLabel("Bass"));
```

```
        add(bassSlider);
        add(new JLabel("Mid"));
        add(midSlider);
        add(new JLabel("Treble"));
        add(trebleSlider);
    }
}

class Demo {
    public static void main(String args[]) {
        new Equalizer().setVisible(true);
    }
}
```

[26]

```
import java.awt.*;
import javax.swing.*;

class CustomUI extends JFrame {
    private JButton button1, button2;
    private JTextField textField;

    CustomUI() {
        setSize(300, 200);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setTitle("Custom UI");
        setLayout(new FlowLayout());

        // Initialize components
        textField = new JTextField(15);
```

```
        button1 = new JButton("Button 1");
        button2 = new JButton("Button 2");

        // Add components to the frame
        add(textField);
        add(button1);
        add(button2);
    }
}

class Demo {
    public static void main(String args[]) {
        new CustomUI().setVisible(true);
    }
}
```

[27]

```
import java.awt.*;
import javax.swing.*;

class EmployeeForm extends JFrame {
    private JTextField nameField, ageField, positionField;
    private JButton submitButton;

    EmployeeForm() {
        setSize(300, 200);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setTitle("Employee Details Form");
        setLayout(new GridLayout(4, 2));
```

```
        // Initialize components
        nameField = new JTextField();
        ageField = new JTextField();
        positionField = new JTextField();
        submitButton = new JButton("Submit");

        // Add components to the frame
        add(new JLabel("Name:"));
        add(nameField);
        add(new JLabel("Age:"));
        add(ageField);
        add(new JLabel("Position:"));
        add(positionField);
        add(submitButton);
    }
}

class Demo {
    public static void main(String args[]) {
        new EmployeeForm().setVisible(true);
    }
}
```

[28]

```
import java.awt.*;
import javax.swing.*;

class SliderExample extends JFrame {
    private JSlider volumeSlider;
```

```
  SliderExample() {
    setSize(300, 100);
    setDefaultCloseOperation(EXIT_ON_CLOSE);
    setTitle("JSlider Example");
    setLayout(new FlowLayout());

    // Initialize the slider
    volumeSlider = new JSlider(JSlider.HORIZONTAL, 0, 100, 50);
    volumeSlider.setMajorTickSpacing(10);
    volumeSlider.setPaintTicks(true);
    volumeSlider.setPaintLabels(true);

    // Add the slider to the frame
    add(volumeSlider);
  }
}

class Demo {
  public static void main(String args[]) {
    new SliderExample().setVisible(true);
  }
}
```

[29]

```
import java.awt.*;
import javax.swing.*;

class SpinnerExample extends JFrame {
  private JSpinner numberSpinner, dateSpinner;
```

```
  SpinnerExample() {
    setSize(300, 100);
    setDefaultCloseOperation(EXIT_ON_CLOSE);
    setTitle("JSpinner Example");
    setLayout(new FlowLayout());

    // Initialize the spinners
    SpinnerModel numberModel = new SpinnerNumberModel(5, 0, 10, 1);
    numberSpinner = new JSpinner(numberModel);

    SpinnerModel dateModel = new SpinnerDateModel();
    dateSpinner = new JSpinner(dateModel);

    // Add the spinners to the frame
    add(numberSpinner);
    add(dateSpinner);
  }
}

class Demo {
  public static void main(String args[]) {
    new SpinnerExample().setVisible(true);
  }
}
```

[30]

```
import java.awt.*;
import javax.swing.*;

class SimpleUI extends JFrame {
```

```
    private JButton button;
    private JLabel label;
    private JTextField textField;

    SimpleUI() {
        setSize(300, 200);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setTitle("Simple UI");
        setLayout(new FlowLayout());

        // Initialize components
        label = new JLabel("Enter text:");
        textField = new JTextField(15);
        button = new JButton("Submit");

        // Add components to the frame
        add(label);
        add(textField);
        add(button);
    }
}

class Demo {
    public static void main(String args[]) {
        new SimpleUI().setVisible(true);
    }
}
```