Week 14 - LAQ's

Instructions

Explain Adjustment event listener.

In Java, an Adjustment Event Listener is used to handle adjustment events generated by components that allow users to adjust values, such as scrollbars and sliders. The AdjustmentEvent class is part of the java.awt.event package and is specifically designed to notify listeners when the value of an adjustable component changes.

Key Components of Adjustment Events

1. Adjustable Interface: The components that generate adjustment events implement the Adjustable interface. This includes components like Scrollbar and JSlider.

2. AdjustmentEvent Class: This class represents the event that occurs when the value of an adjustable component changes. It contains methods to retrieve information about the event, such as the source component and the type of adjustment.

3. AdjustmentListener Interface: To respond to adjustment events, a class must implement the AdjustmentListener interface, which contains a single method:

- void adjustmentValueChanged(AdjustmentEvent e): This method is called whenever the value of the adjustable component changes.

Types of Adjustment Events

Adjustment events can occur in different ways, such as:

- When the user drags the thumb of a scrollbar or slider.

- When the user clicks on the arrows of a scrollbar.
- When the user uses keyboard input to change the value.

Example Code

Here's a simple example demonstrating how to use an Adjustment Listener with a Scrollbar in a Java Swing application:

```
import java.awt.*;

import java.awt.event.*;

import javax.swing.*;


public class AdjustmentEventExample extends JFrame implements AdjustmentListener {

   private Scrollbar scrollbar;

   private JLabel label;


   public AdjustmentEventExample() {

      // Create a Scrollbar

      scrollbar = new Scrollbar(Scrollbar.HORIZONTAL, 0, 1, 0, 100);

      scrollbar.addAdjustmentListener(this); // Add AdjustmentListener


      // Create a label to display the scrollbar value

      label = new JLabel("Scrollbar Value: " + scrollbar.getValue());


      // Set up the layout
```

```
        setLayout(new FlowLayout());
        add(scrollbar);
        add(label);

        // Frame settings
        setTitle("Adjustment Event Example");
        setSize(300, 100);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setVisible(true);
    }

    // Handle adjustment events
    public void adjustmentValueChanged(AdjustmentEvent e) {
        // Update the label with the current value of the scrollbar
        label.setText("Scrollbar Value: " + scrollbar.getValue());
    }

    public static void main(String[] args) {
        new AdjustmentEventExample();
    }
}
```

Explanation of the Example

1. Scrollbar Creation: A horizontal Scrollbar is created with a range from 0 to 100. The initial value is set to 0.

2. Adjustment Listener: The AdjustmentListener is added to the scrollbar using addAdjustmentListener(this), allowing the class to respond to adjustment events.

3. Label for Display: A JLabel is created to display the current value of the scrollbar.

4. Event Handling: The adjustmentValueChanged method is overridden to update the label whenever the scrollbar value changes.

5. Layout and Display: The scrollbar and label are added to the frame, and the frame is displayed.