Day 15 – Introduction to Java Swing (GUI Programming)

Objective:

To understand the basics of Java Swing for creating graphical user interfaces (GUIs) and learn how to design simple interactive windows using buttons, labels, and text fields.

Content:

Today, I learned about **Java Swing**, a part of the `javax.swing` package that allows developers to build **Graphical User Interface (GUI)** applications.
Swing provides lightweight, platform-independent components such as windows, buttons, labels, and text fields.

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1. What is Swing?

- Swing is built on top of **Abstract Window Toolkit (AWT)** and provides **more advanced GUI components**.
- It follows the **Model-View-Controller (MVC)** architecture.
- Commonly used classes: `JFrame`, `JLabel`, `JButton`, `JTextField`, `JPanel`.

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2. Creating a Simple Swing Window

Example:

```
import javax.swing.*;

public class SwingExample {
    public static void main(String[] args) {
        JFrame frame = new JFrame("My First Swing App");
        JLabel label = new JLabel("Welcome to Java Swing!");
        JButton button = new JButton("Click Me");
```

```
        label.setBounds(100, 50, 200, 30);
        button.setBounds(120, 100, 100, 30);

        frame.add(label);
        frame.add(button);

        frame.setSize(400, 250);
        frame.setLayout(null);
        frame.setVisible(true);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
}
```

Output:
A small window appears with a label saying *"Welcome to Java Swing!"* and a clickable button.

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3. Event Handling

To make GUI components interactive, **event listeners** are used.
For example, to perform an action when a button is clicked:

```
button.addActionListener(e -> {
    JOptionPane.showMessageDialog(frame, "Button Clicked!");
});
```

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4. Common Swing Components

Component	Description
`JFrame`	Main window container
`JLabel`	Displays text or image

`JButton`	Creates a clickable button
`JTextField`	Allows text input
`JCheckBox`, `JRadioButton`	For selection inputs
`JTable`	Displays tabular data

Learning Outcome:

Learned how to design and implement basic graphical user interfaces using Swing.
Understood the use of core Swing components and event handling mechanisms.
Gained the ability to create interactive desktop applications with simple visual elements.