Introduction to GUI Development in Java

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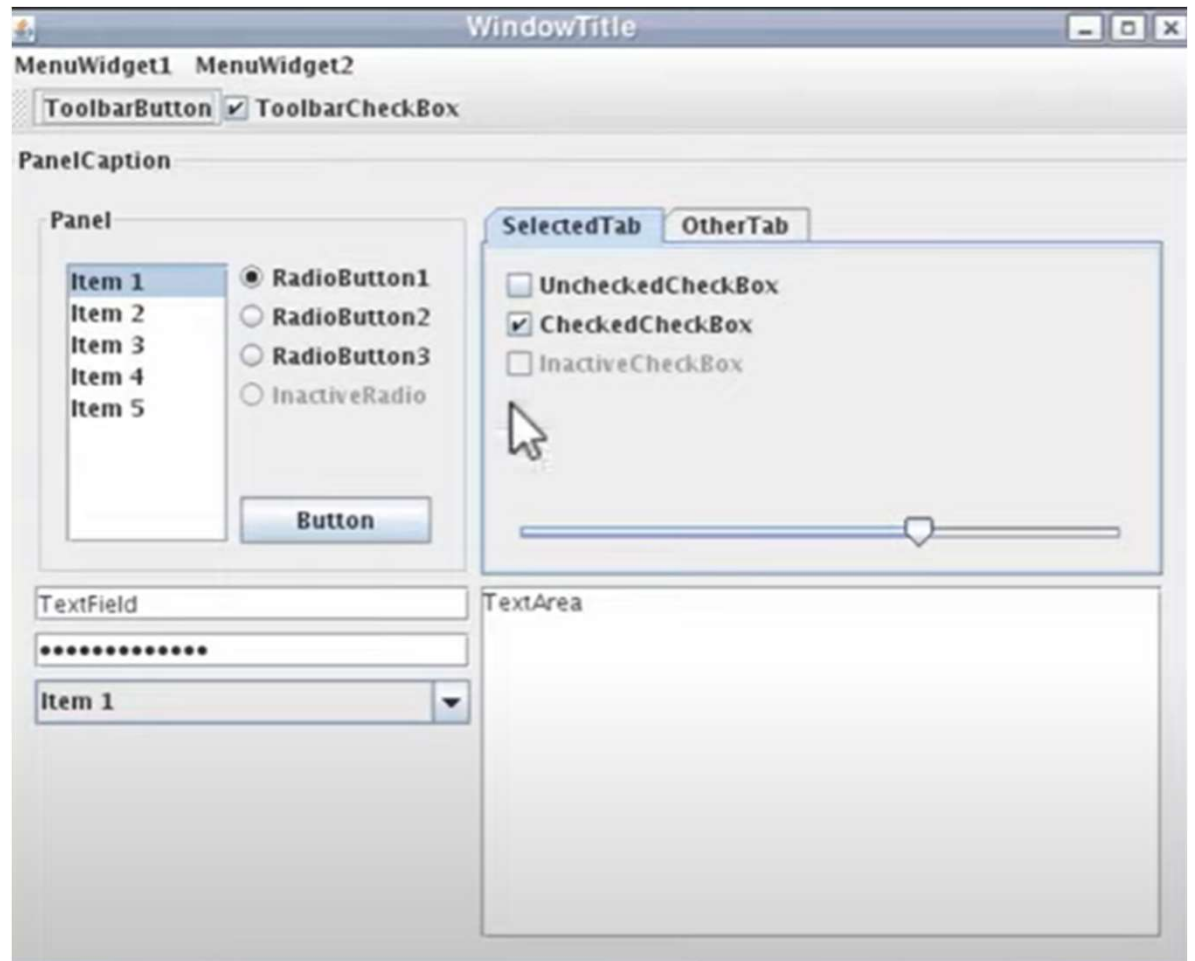
JAVA SWING

JAVA SWING IS AN API

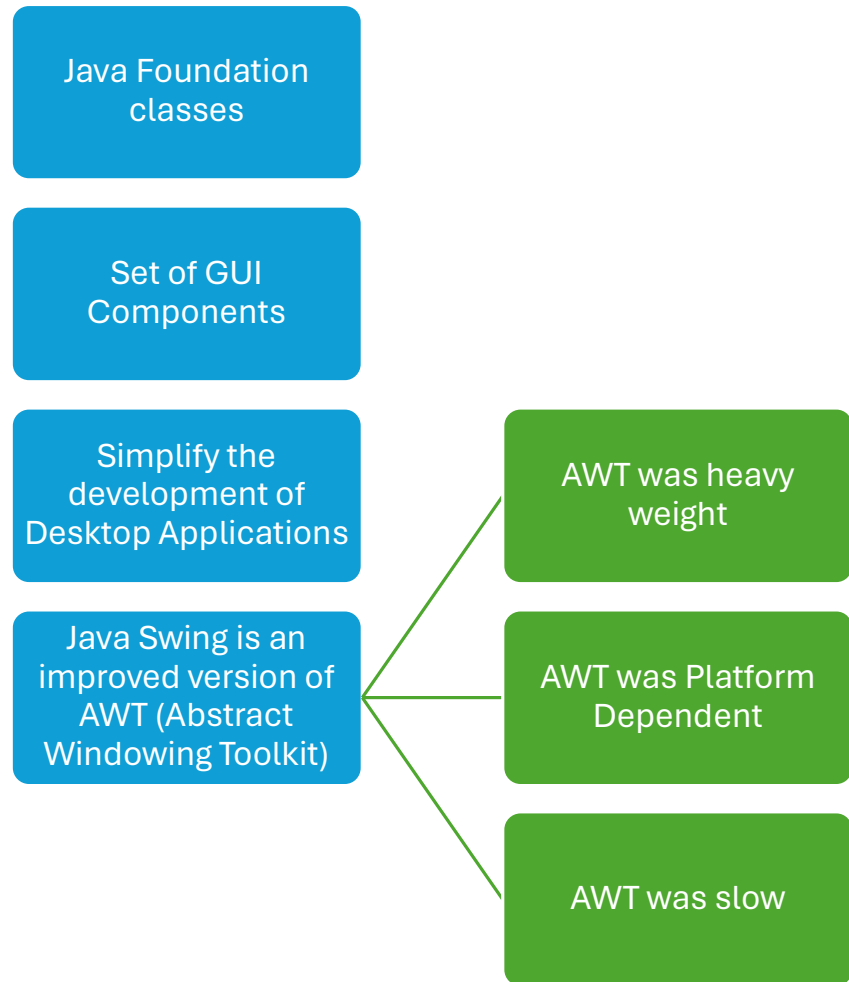PART OF JFC (JAVA FOUNDATION CLASSES)

Used to create GUI Applications in java

What is JFC

Java Foundation classes

Set of GUI Components

Simplify the development of Desktop Applications

Java Swing is an improved version of AWT (Abstract Windowing Toolkit)

AWT was heavy weight

AWT was Platform Dependent

AWT was slow

JAVA SWING

- Built on top of AWT API, and entirely written in java
- SWING provides platform independent and lightweight components
- More components were added which were not available in AWT
- Acts as a replacement of AWT, as It contains AWT components along with some other components
- Swing supports MVC Architecture, which was lacking in AWT

SWING FEATURES

LIGHT-WEIGHT: Os Independent, and rendered quickly

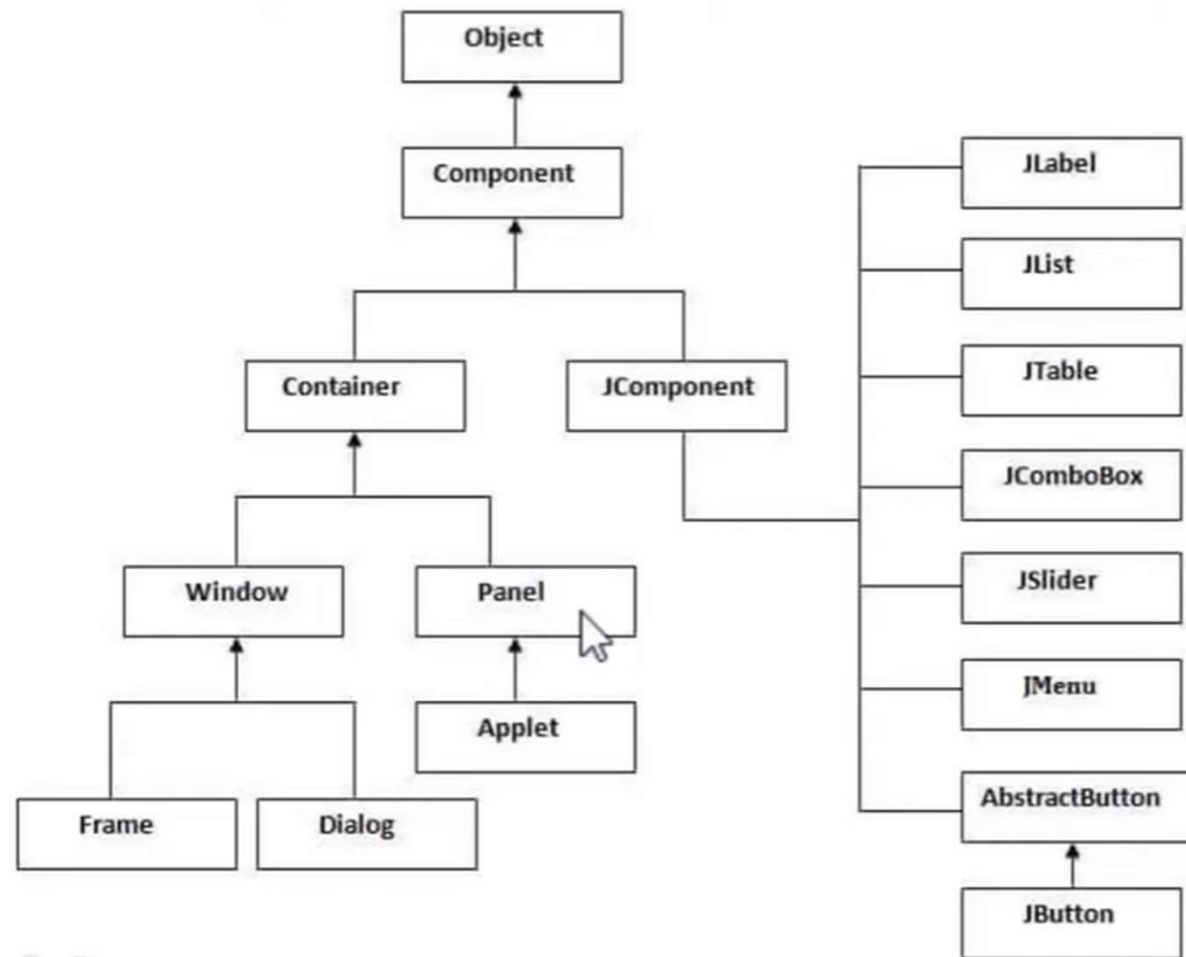**Rich controls:**   Advanced controls, like: Tree, colorpicker, TabbedPane etc

Highly Customizable: You can change the look and feel of added components

javax.swing

Package which provides
classes for java swing API such
as JButton, JTextField,etc

```
                         ┌──────────┐
                         │  Object  │
                         └──────────┘
                               ▲
                               │
                        ┌─────────────┐
                        │  Component  │
                        └─────────────┘
                               ▲
                               │
              ┌────────────────┴──────────────────┐
        ┌────────────┐                      ┌──────────────┐          ┌──────────────┐
        │  Container │                      │  JComponent  │────┬─────│    JLabel    │
        └────────────┘                      └──────────────┘    │     └──────────────┘
               ▲                                                 │     ┌──────────────┐
               │                                                 ├─────│     JList     │
      ┌────────┴─────────┐                                       │     └──────────────┘
 ┌──────────┐      ┌──────────┐                                  │     ┌──────────────┐
 │  Window  │      │  Panel   │                                  ├─────│    JTable     │
 └──────────┘      └──────────┘                                  │     └──────────────┘
      ▲                 ▲                                        │     ┌──────────────┐
      │                 │                                        ├─────│   JComboBox   │
      │           ┌──────────┐                                   │     └──────────────┘
      │           │  Applet  │                                   │     ┌──────────────┐
      │           └──────────┘                                   ├─────│    JSlider    │
 ┌─────────┬───────────┐                                         │     └──────────────┘
┌────────┐ ┌──────────┐                                          │     ┌──────────────┐
│ Frame  │ │  Dialog  │                                          ├─────│     JMenu      │
└────────┘ └──────────┘                                          │     └──────────────┘
                                                                 │     ┌────────────────┐
                                                                 └─────│ AbstractButton │
                                                                       └────────────────┘
                                                                               ▲
                                                                               │
                                                                       ┌──────────────┐
                                                                       │   JButton    │
                                                                       └──────────────┘
```

AWT vs SWING

ADDING JFRAME FORM

When we add a JFRAME Form: A class is associated with the form

javax.swing.JFrame is a class, and it is a type of container which inherits from java.awt.Frame class

JFrame works like a window, where labels, buttons, textfields are added to create a GUI

Creating First GUI App

Add package

Add JFrame form

initcomponents()

Exploring the properties and pallete

resizable

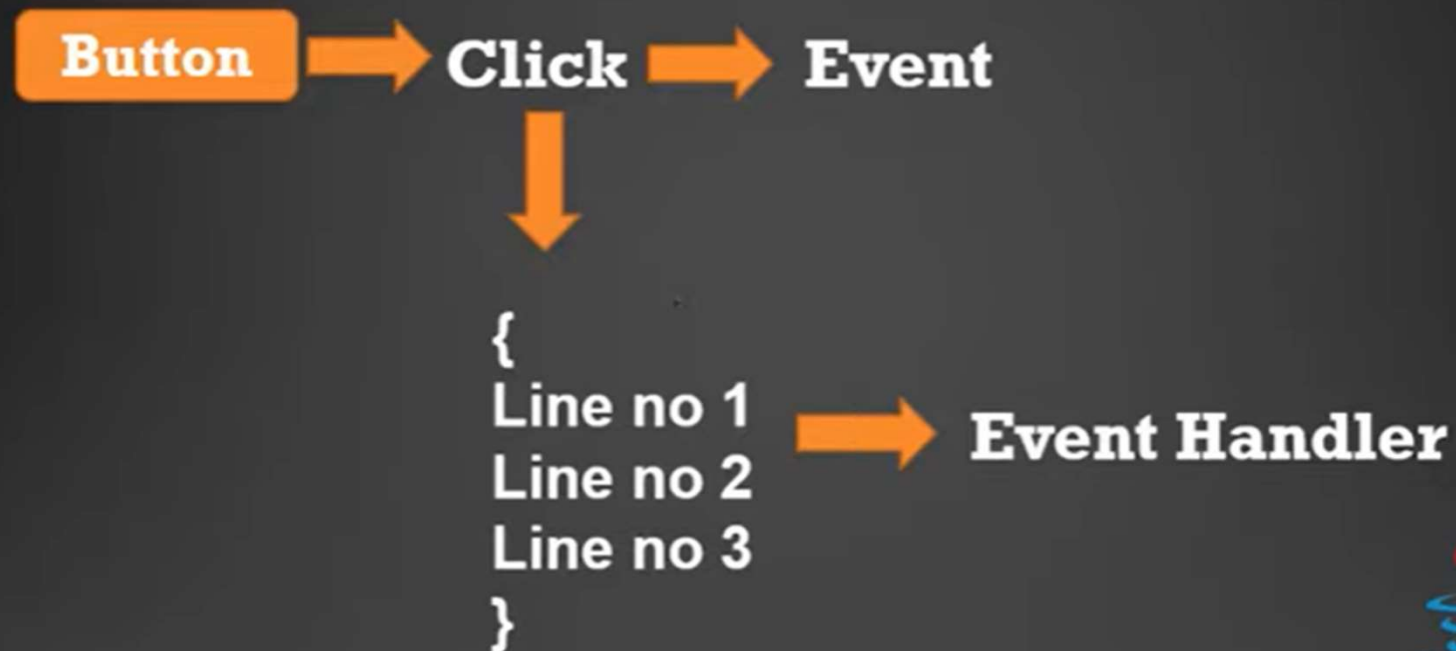Changing the height and width

Change Background using constructor:

- getContentPane().setBackground(Color.YELLOW)

Default Close Operation

- Unlike Frame, Jframe has options to hide or close the window with the help of setDefaultCloseOperation(int) method.

What is an event?

Change in state of the object is called event

Events are generated as a result of user interaction with the GUI Components

Examples:

Click a Button

Move a mouse

Selecting an item from the list
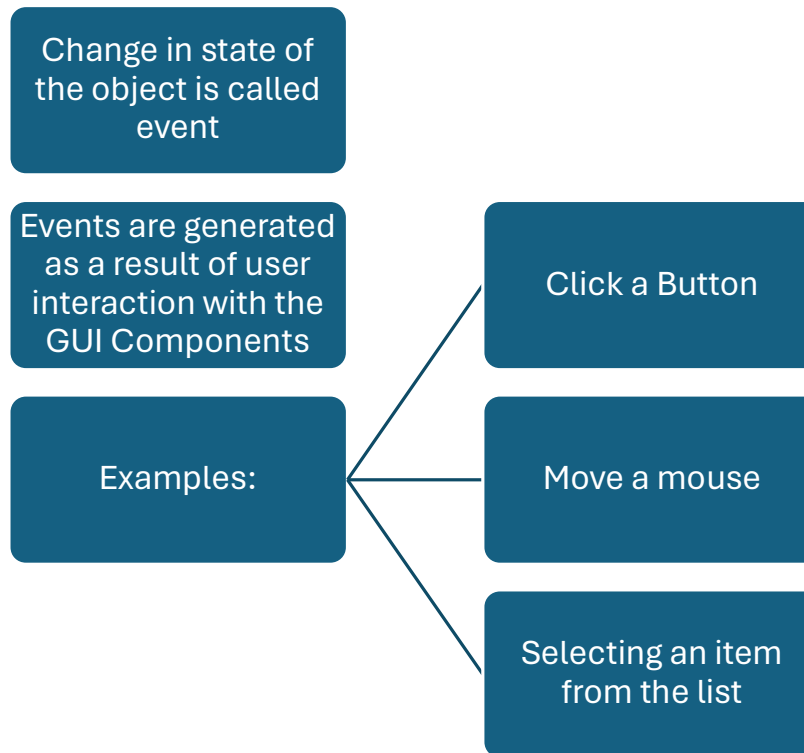
Event Handling

Mechanism that describes what should happen when an event occurs

This mechanism has a code called as a event handler, which is executed when an event occurs

Java uses Delegation event Model, a standard mechanism to handle the events

Handle a Button Click Event

- Add a Button

- Now Show a dialog box:

```
JOptionPane.showMessageDialog(this, "Welcome To Java Swing GUI")
```

- Now add a label and change the text of the label upon clicking the button

- Now change the background color upon clicking the button