

Java Review Session 8

CS 5004

Topics Covered

Java Syntax

- Graphical User Interfaces (GUIs)
- Java Swing package

Java Swing Tutorials: <https://docs.oracle.com/javase/tutorial/uiswing/>

Graphical User Interfaces (GUIs)

What is an interface?

- The means by which a user interacts with a computer or software program

What is a Graphical User Interface?

- A Graphical User Interface is a user-friendly interface that allows users to interact with Java applications through graphical components such as windows, buttons, text-fields, and other visual components

What about the Command Line Interface (CLI)?

- This is also a type of interface, but not a graphical one!
- The CLI is a text-based user interface

Swing Hello World

Demo

The JFrame

JFrame - a JFrame is a top-level container that represents the main window of a Swing application (the primary window through which a user interacts with your application)

- It also acts as the main entry point for a Swing application
- Uses a border layout as its default layout manager
- Used to create the main window of the application where other Swing components can be added (buttons, text fields, labels, etc.)
- Some common JFrame settings:
 - `setDefaultCloseOperation`
 - `setSize`
 - `setLocationRelativeTo`
 - `setVisible`
 - `setLayout`

The JPanel

JPanel - is a general-purpose container used for organizing and grouping Swing components

- Useful for helping to hold and arrange other Swing components
- Serves as a sub-container within a JFrame
 - Sort of like a secondary container within the top-level container
- Useful for creating “sections” within your user interface
- Can specify which layout you would like to use inside of it

Types of GUI Layouts

A few common layouts:

- **Flow layout** - used in JPanels and arranges components from left to right and starts a new row when there is no more room
- **Border layout** - (see right) groups components into five areas: North, South, East, West, and Center
- **Grid Layout** - arranges components in a grid with a fixed number of rows and columns
- **Box Layout** - arranges components either horizontally or vertically
- More complex layouts: grid bag layout / group layout
- Can set in a JFrame using: `frame.setLayout()`

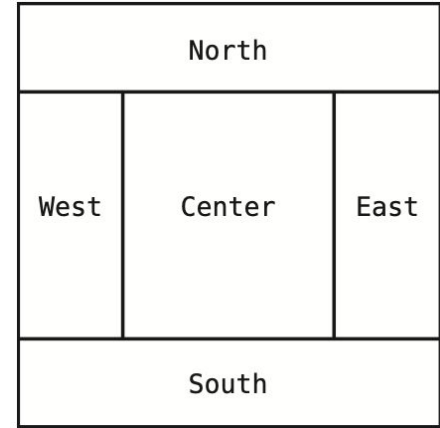


Image: Cay Horstmann

JLabel

JLabel - is a component that displays a short string or image icon

- Generally used to label other Swing components

Content Pane - the primary container where you add all your Swing components

- JFrames are the top level container that provide the window on the screen
- You don't add components directly to the JFrame, but to the content pane
- **Use:** `frame.getContentPane().add()`
- The primary container of the JFrame

JTextFields and JTextAreas

JTextFields - is a text component that allows a user to input a single line of text

- Used for reading a single line of text

JTextAreas - is a text component that allows a user to input multiple lines of text

- Used for reading in multiple lines of text

JButtons

JButton - a component that represents a button that can perform an action when clicked

- You need to implement an Action Listener if you want your program to be able to handle an event (such as a button click)
- When a user interacts with a JButton, an action listener is notified so that it can execute code in response

Choices - Radio Buttons, Check Boxes, and Combo Boxes

Radio Button - is a component that allows a user to select one option from a group of options

- Useful when you have a small set of mutually exclusive choices
- Only one button can be selected at a time

Checkbox - a user interface component with two states: checked and unchecked

- Used when one selection does not exclude another

Combobox - a combination of a list and a text field where the text field displays the current selection

- Used when you have a large number of choices

All of these generate action events just like buttons (whenever a user selects an option)

Hierarchy of Swing Components

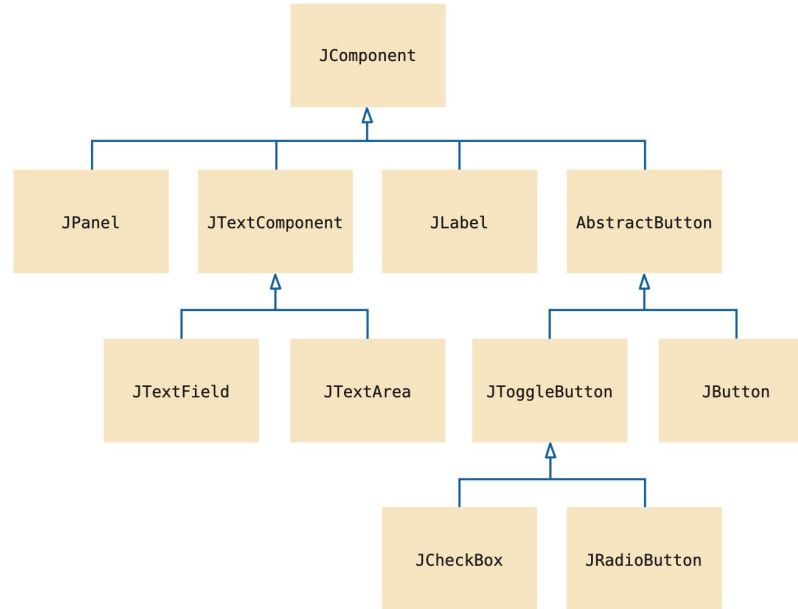


Figure 5 A Part of the Hierarchy of Swing User-Interface Components

Image: Cay Horstmann