

1. Swing Containers

Swing containers can be classified into **three main categories**:

- **Top-level containers:**

JFrame, JWindow, and JDialog

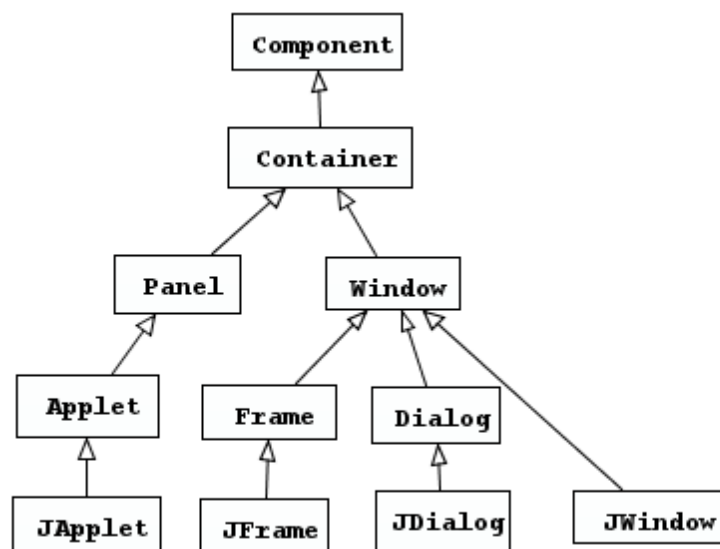
- **General-purpose containers:**

JPanel, JScrollPane, JToolBar, JSplitPane, and JTabbedPane

- **Special-purpose containers:**

InternalFrame and JLayeredPane

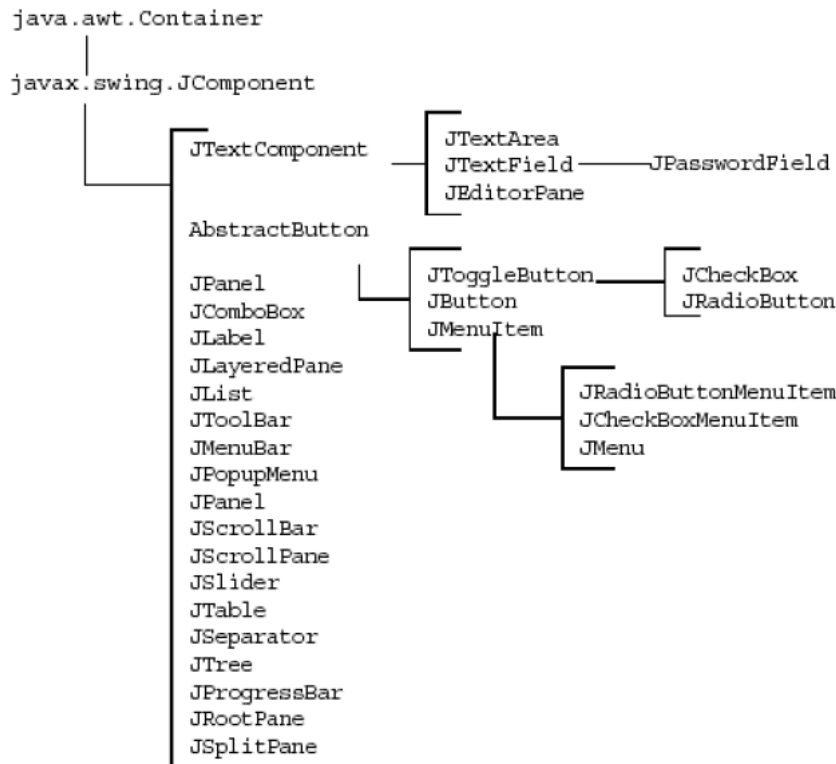
Top-Level Containers



2. Swing components can be broadly classified as:

- Buttons
- Text components
- Uneditable information display components
- Menus
- Formatted display components
- Other basic controls

3. Swing Component Hierarchy



Text Components

Swing text components can be broadly divided into three categories.

- **Text controls** – JTextField, JPasswordField(for user input)
- **Plain text areas** – JTextArea(displays text in plain text, also for multi-line user input)
- **Styled text areas** – JEditorPane, JTextPane (displays formatted text)

3. Layout Managers

A layout manager determines *the size and position* of the components within a **container**.

Handle problems caused by:

- GUI resizing by user
- Operating system differences in fonts
- Locale-specific text layout requirements (left-right, right-left, vertical)

Layout manager classes:

- BorderLayout
- FlowLayout
- BoxLayout
- CardLayout
- GridLayout
- GridBagLayout

- **The BorderLayout Manager**

The BorderLayout manager places components in **top, bottom, left, right and center** locations.



Example

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

```
public class BorderExample {  
    private JFrame f; // containers;  
    private JButton bn, bs, bw, be, bc; // components;
```

```
    public BorderExample() {  
        f = new JFrame("Border Layout");  
        bn = new JButton("Button 1");  
        bc = new JButton("Button 2");  
        bw = new JButton("Button 3");  
        bs = new JButton("Button 4");  
        be = new JButton("Button 5");  
    }
```

```
    public void launchFrame() {  
        f.add(bn, BorderLayout.NORTH); // managare layout  
        f.add(bs, BorderLayout.SOUTH);
```



```
f.add(bw, BorderLayout.WEST);
f.add(be, BorderLayout.EAST);
f.add(bc, BorderLayout.CENTER);
f.setSize(400,200);
f.setVisible(true);
}

public static void main(String args[]) {
    BorderExample guiWindow2 = new BorderExample();
    guiWindow2.launchFrame();
}
}
```

- **The FlowLayout Manager**

The FlowLayout manager places components in **a row, and if the row fills, components are placed in the next row.**

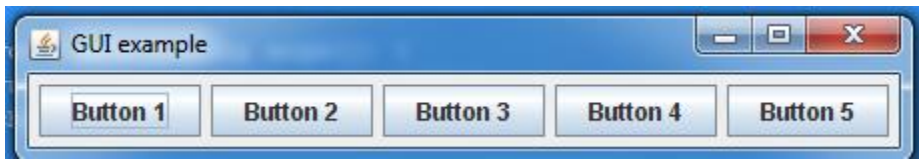
```
package Application_BooksJava;
import javax.swing.*;
import java.awt.*;

public class LayoutExample {
    private JFrame f;
    private JButton b1;
    private JButton b2;
    private JButton b3;
    private JButton b4;
    private JButton b5;

    public LayoutExample() {
        f = new JFrame("GUI example");
        b1 = new JButton("Button 1");
        b2 = new JButton("Button 2");
        b3 = new JButton("Button 3");
        b4 = new JButton("Button 4");
        b5 = new JButton("Button 5");
    }

    public void launchFrame() {
        f.setLayout(new FlowLayout());
        f.add(b1);
        f.add(b2);
        f.add(b3);
        f.add(b4);
        f.add(b5);
    }
}
```

```
f.pack();  
f.setVisible(true);  
}  
  
public static void main(String args[]) {  
    LayoutExample guiWindow = new LayoutExample();  
    guiWindow.launchFrame();  
}
```



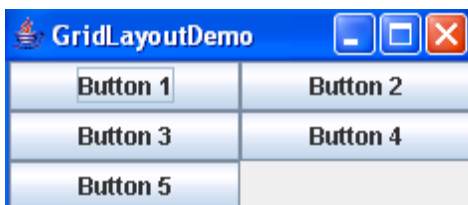
- **The BorderLayout Manager**

The BorderLayout manager adds components **from left to right, and from top to bottom in a single row of column.**



- **The GridLayout Manager**

The GridLayout manager places components in rows and columns in the form of a grid.





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

public class GridExample {
    private JFrame f;
    private JButton b1, b2, b3, b4, b5;

    public GridExample() {
        f = new JFrame("Grid Example");
        b1 = new JButton("Button 1");
        b2 = new JButton("Button 2");
        b3 = new JButton("Button 3");
        b4 = new JButton("Button 4");
        b5 = new JButton("Button 5");
    }

    public void launchFrame() {
        f.setLayout (new GridLayout(3,2));

        f.add(b1);
        f.add(b2);
        f.add(b3);
        f.add(b4);
        f.add(b5);

        f.pack();
        f.setVisible(true);
    }

    public static void main(String args[]) {
        GridExample grid = new GridExample();
        grid.launchFrame();
    }
}
```