Experiment No.9

Title: Implementation of GUI using SWING
Aim: Implementation of GUI using SWING.

Theory:

Difference between AWT and Swing

There are many differences between java awt and swing that are given below.

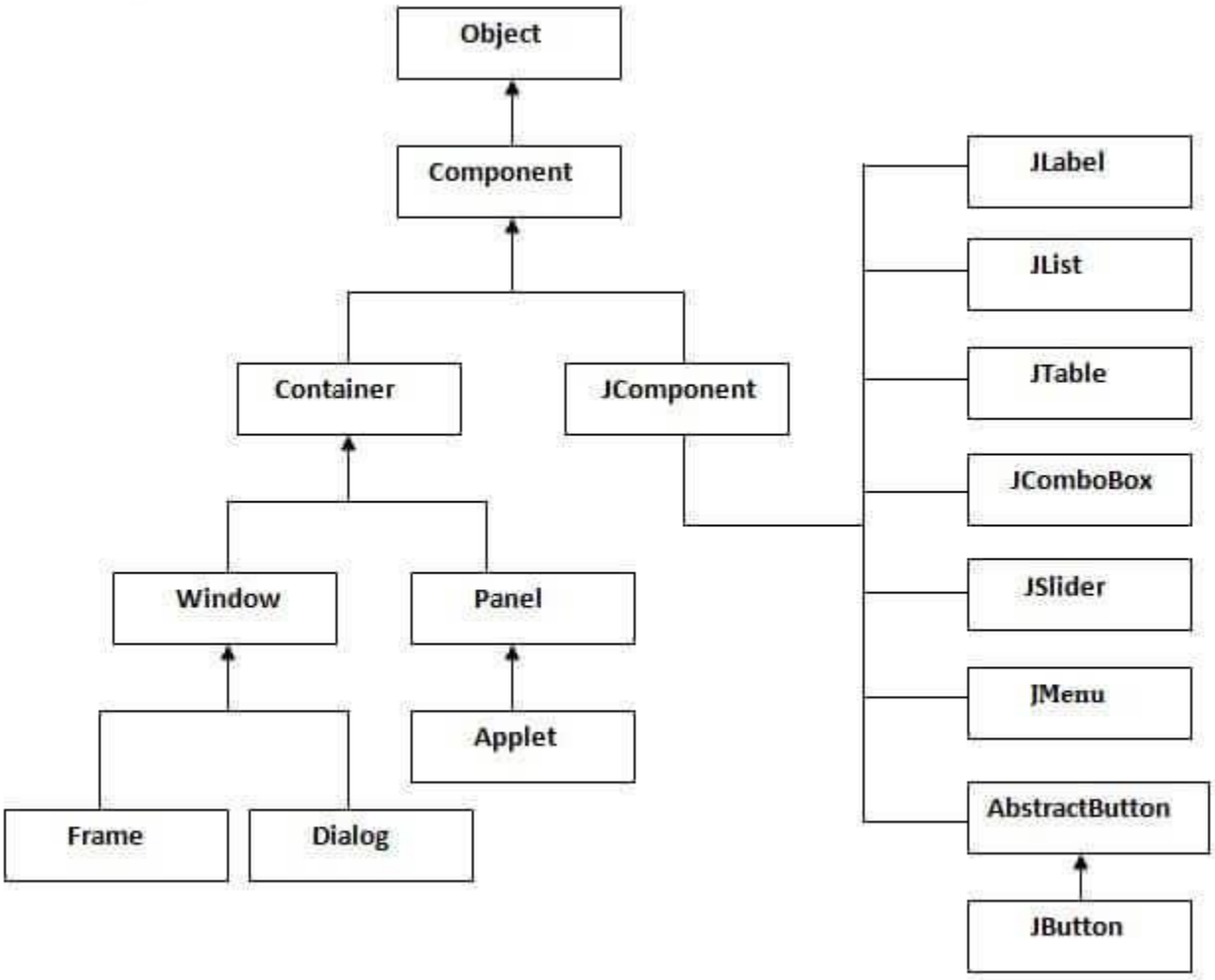
No.	Java AWT	Java Swing
1)	AWT components are **platform-dependent**.	Java swing components are **platform-independent**.
2)	AWT components are **heavyweight**.	Swing components are **lightweight**.
3)	AWT **doesn't support pluggable look and feel**.	Swing **supports pluggable look and feel**.
4)	AWT provides **less components** than Swing.	Swing provides **more powerful components** such as tables, lists, scrollpanes, colorchooser, tabbedpane etc.
5)	AWT **doesn't follows MVC**(Model View Controller) where model represents data, view represents presentation and controller acts as an interface between model and view.	Swing **follows MVC**.

Features of the Java Foundation Classes	
Feature	**Description**
Swing GUI Components	Includes everything from buttons to split panes to tables.
Pluggable Look-and-Feel Support	Gives any program that uses Swing components a choice of look and feel. For example, the same program can use either the Java or the Windows look and feel. Many more look-and-feel packages are available from various sources. As of v1.4.2, the Java platform supports the GTK+ look and feel, which makes hundreds of existing look and feels available to Swing programs.
Accessibility API	Enables assistive technologies, such as screen readers and Braille displays, to get information from the user interface.
Java 2D API	Enables developers to easily incorporate high-quality 2D graphics, text, and images in applications and applets. Java 2D includes extensive APIs for generating and sending high-quality output to printing devices.
Drag-and-Drop Support	Provides the ability to drag and drop between Java applications and native applications.
Internationalization	Allows developers to build applications that can interact with users worldwide in their own languages and cultural conventions. With the input method framework developers can build applications that accept text in languages that use thousands of different characters, such as Japanese, Chinese, or Korean.

JFC features apply to Swing components.
The Swing API is powerful, flexible--and immense. In release 1.4 of the Java platform, the SwingAPI has 17 public packages:

javax.accessibility	javax.swing.plaf	javax.swing.text.html
javax.swing	javax.swing.plaf.basic	javax.swing.text.parser
javax.swing.border	javax.swing.plaf.metal	javax.swing.text.rtf
javax.swing.colorchooser	javax.swing.plaf.multi	javax.swing.tree
javax.swing.event	javax.swing.table	javax.swing.undo
javax.swing,filechooser	javax.swing.text	

The hierarchy of java swing API is given below.



Commonly used Methods of Component class

The methods of Component class are widely used in java swing that are given below.

Method	Description
public void add(Component c)	add a component on another component.
public void setSize(int width,int height)	sets size of the component.
public void setLayout(LayoutManager m)	sets the layout manager for the component.

public void setVisible(boolean b)	sets the visibility of the component. It is by default false.

Event and Listener (Java Event Handling)

Changing the state of an object is known as an event. For example, click on button, dragging mouse etc. event classes and Listener interfaces for event handling.

Java Event classes and Listener interfaces

Event Classes	Listener Interfaces
ActionEvent	ActionListener
MouseEvent	MouseListener and MouseMotionListener
MouseWheelEvent	MouseWheelListener
KeyEvent	KeyListener
ItemEvent	ItemListener
TextEvent	TextListener
AdjustmentEvent	AdjustmentListener
WindowEvent	WindowListener
ComponentEvent	ComponentListener
ContainerEvent	ContainerListener
FocusEvent	FocusListener

Code:

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

/*<applet code="swingdemo" width=200 height=200>

</applet>*/

public class swingdemo extends JApplet

{          public void init()

          { JLabel l1=new JLabel("My swing program"); ImageIcon i1=new ImageIcon("images.gif");
                    JButton b1=new JButton(i1);
                    add(l1);
                    add(b1);
           }
          public void paint(Graphics g)
          {
                    g.drawString("my swing program",30,30);
          }
    }
```

Problem Statement:

Develop a Swing GUI based standard calculator program. Use event handling, Layout of swing package.

Conclusion: Thus we have studied and implemented GUI with SWING.