Experiment No. 3

Aim of the Experiment: Develop a GUI which accepts the information regarding the marks for all the subjects of a student in the examination. Display the result for a student in a separate window.

Objective:

To Develop program using GUI framework (AWT and Swing)

Resources: Eclipse IDE 2018, JDK 1.8.0 is required

.Course Outcome Addressed: CO3

Theory:

GUI: GUI stands for **Graphical User Interface**. This is a type of user interface where user interacts with the computer **using graphics**. Graphics include icons, navigation bars, images etc. Mouse can be used while using this interface to interact with the graphics. It is a very **user-friendly** interface and requires no expertise. Eg: Windows has GUI.

Swing in Java is a Graphical User Interface (GUI) toolkit that includes the GUI components. Swing provides a rich set of widgets and packages to make sophisticated GUI components for Java applications. Swing is a part of Java Foundation Classes(JFC), which is an API for Java GUI programing that provide GUI.

The Java Swing library is built on top of the Java Abstract Widget Toolkit (**AWT**), an older, platform dependent GUI toolkit. You can use the Java simple GUI programming components like button, textbox, etc., from the library and do not have to create the components from scratch.

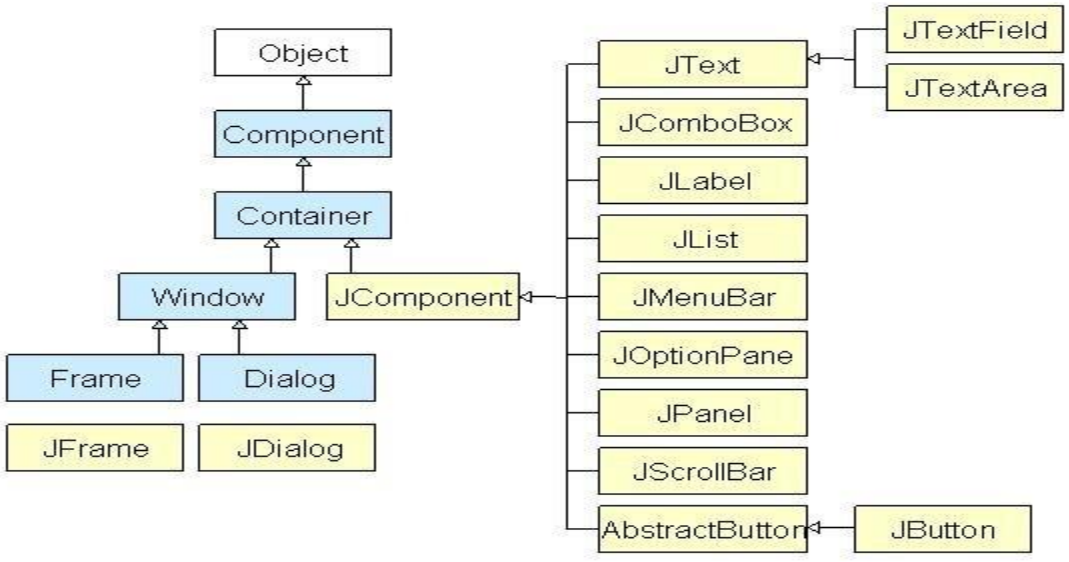


Fig. Java Swing Class Hierarchy Diagram

Container Class:

Container classes are classes that can have other components on it. So for creating a Java Swing GUI, we need at least one container object. There are 3 types of Java Swing containers.

1. Panel: It is a pure container and is not a window in itself. The sole purpose of a Panel is to organize the components on to a window.
2. Frame: It is a fully functioning window with its title and icons.
3. Dialog: It can be thought of like a pop-up window that pops out when a message has to be displayed. It is not a fully functioning window like the Frame.

Following is the list of commonly used controls while designing GUI using SWING.

S.No.	Class & Description
1	JLabel A JLabel object is a component for placing text in a container.
2	JButton This class creates a labeled button.
3	JColorChooser A JColorChooser provides a pane of controls designed to allow a user to manipulate and select a color.
4	JCheck Box A JCheckBox is a graphical component that can be in either an on (true) or off (false) state.
5	JRadioButton The JRadioButton class is a graphical component that can be in either an on (true) or off (false) state. in a group.
6	JList A JList component presents the user with a scrolling list of text items.
7	JComboBox A JComboBox component presents the user with a to show up menu of choices.

8	JTextField A JTextField object is a text component that allows for the editing of a single line of text.
9	JPasswordField A JPasswordField object is a text component specialized for password entry.
10	JTextArea A JTextArea object is a text component that allows editing of a multiple lines of text.
11	ImageIcon A ImageIcon control is an implementation of the Icon interface that paints Icons from Images
12	JScrollbar A Scrollbar control represents a scroll bar component in order to enable the user to select from range of values.
13	JOptionPane JOptionPane provides set of standard dialog boxes that prompt users for a value or informs them of something.
14	JFileChooser A JFileChooser control represents a dialog window from which the user can select a file.
15	JProgressBar As the task progresses towards completion, the progress bar displays the task's percentage of completion.
16	JSlider A JSlider lets the user graphically select a value by sliding a knob within a bounded interval.
17	JSpinner A JSpinner is a single line input field that lets the user select a number or an object value from an ordered sequence.

SOURCE CODE:

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
import java.io.*;
public class StudentResult {
  // Function to write a student information in JFrame and storing it in a file
  public static void StudentInfo()
  {// Creating a new frame using JFrame
     JFrame f = new JFrame("Student Result Form");


// Creating the labels
     JLabel l1, l2, l3, l4, l5,l6,l7,l8,l9;


// Creating three text fields for student name, college mail ID  and for  Mobile No
     JTextField t1, t2, t3,t4,t5,t6,t7;


 // Creating two JComboboxes for Branch and for Section
     JComboBox j1, j2;


// Creating  two buttons
     JButton b1, b2;


// Naming the labels and setting
     // the bounds for the labels
     l1 = new JLabel("Student Name:");
     l1.setBounds(50, 50, 100, 30);
     l2 = new JLabel("Branch:");
     l2.setBounds(50, 100, 120, 30);
     l3 = new JLabel("Div :");
     l3.setBounds(400, 50, 50, 30);
     l4 = new JLabel("Roll no:");
     l4.setBounds(400, 100, 70, 30);
     l5 = new JLabel(" MC:");
     l5.setBounds(400, 150, 70, 30);
     l6 = new JLabel("EMF:");
     l6.setBounds(50, 150, 70, 30);
     l7 = new JLabel("FJP:");
     l7.setBounds(400, 200, 70, 30);
```

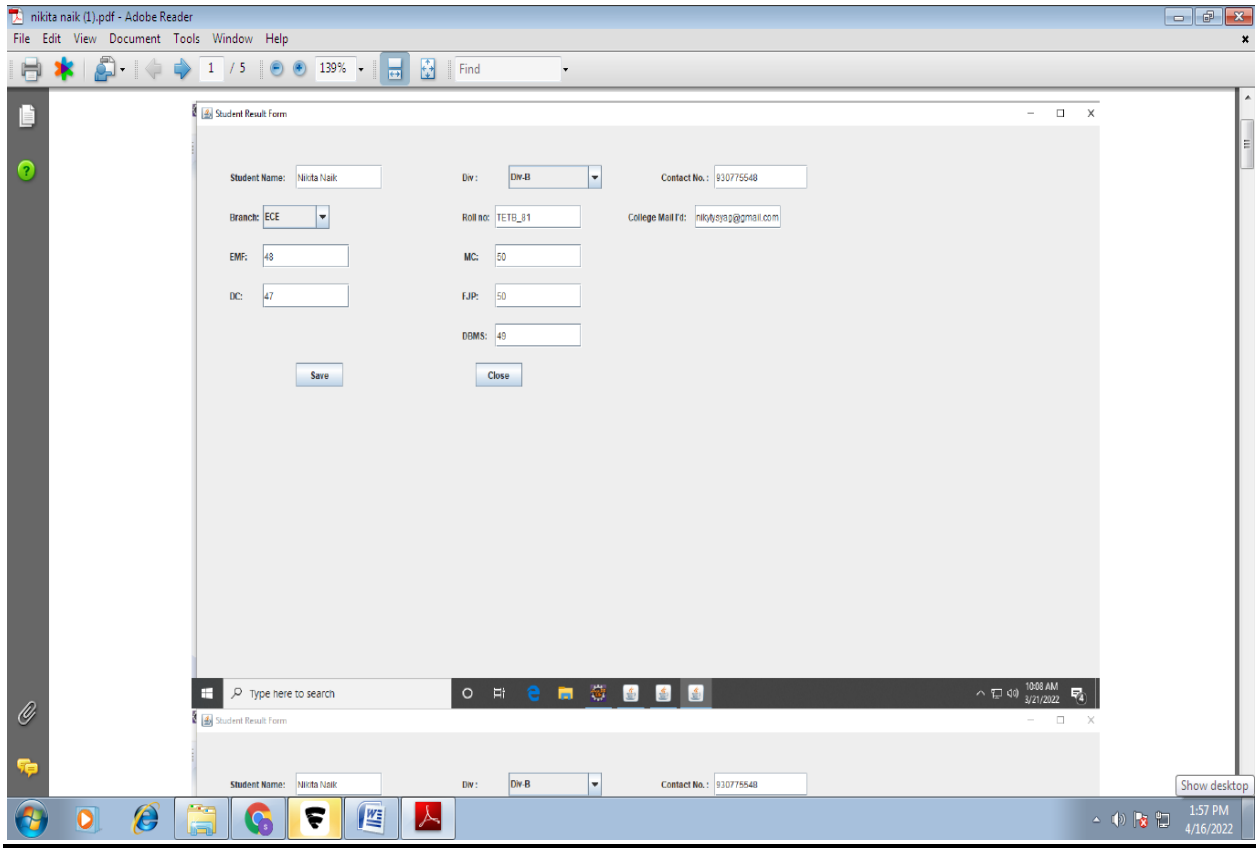
```
l8 = new JLabel("DC:");
l8.setBounds(50, 200, 70, 30);
l9 = new JLabel("DBMS:");
l9.setBounds(400, 250, 70, 30);



// Creating the textfields and
// setting the bounds for textfields
t1 = new JTextField();
t1.setBounds(150, 50, 130, 30);
t2 = new JTextField();
t2.setBounds(450, 100, 130, 30);
t3 = new JTextField();
t3.setBounds(450, 150, 130, 30);
t4 = new JTextField();
t4.setBounds(100, 150, 130, 30);
t5 = new JTextField();
t5.setBounds(450, 200, 130, 30);
t6 = new JTextField();
t6.setBounds(100, 200, 130, 30);
t7 = new JTextField();
t7.setBounds(450, 250, 130, 30);

// Creating two string arrays one for
// braches and other for sections
String s1[ ]
   = { "  ", "CSE", "ECE", "EEE",
      "CIVIL", "MECH", "Others" };
String s2[ ]
   = { "  ", "Div-A", "Div-B", "Div-C"};

// Creating two JComboBoxes for selecting branch and other for selecting the section
// and setting the bounds
j1 = new JComboBox(s1);
j1.setBounds(100, 100, 100, 30);
j2 = new JComboBox(s2);
j2.setBounds(470, 50, 140, 30);

// Creating one button for Saving and other button to close
// and setting the bounds
b1 = new JButton("Save");
b1.setBounds(150, 300, 70, 30);
b2 = new JButton("Close");
```

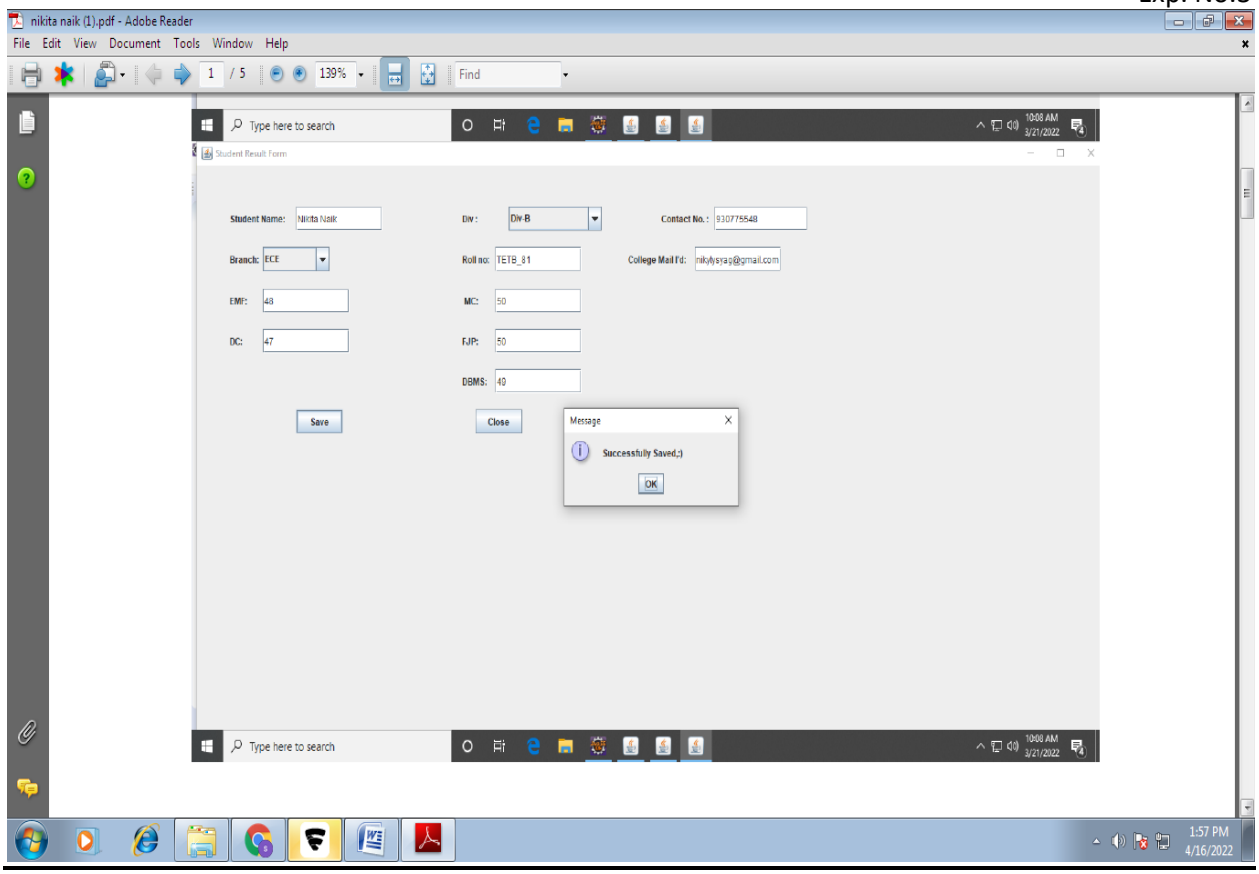
```
b2.setBounds(420, 300, 70, 30);

// Adding action listener
b1.addActionListener(new ActionListener() {
   public void actionPerformed(ActionEvent e)
   {

      // Getting the text from text fields
      // and JComboboxes
      // and copying it to a strings

      String s1 = t1.getText();
      String s2 = t2.getText();
      String s3 = j1.getSelectedItem() + "";
      String s4 = j2.getSelectedItem() + "";
      String s5 = t3.getText();
      String s6 = t4.getText();
      String s7 = t5.getText();
      String s8 = t6.getText();
      String s9 = t7.getText();

      String res="";
      if (e.getSource() == b1) {

            res=res+"Name is: "+ s1 + "  |  ";
            res=res+ "Roll no is:"+s2 + "  |  ";
            res=res+"Branch is:"+ s3 + "  |  ";
            res=res+"Division is:"+ s4 + "  |  ";
            res=res+"Marks of MC is:"+s5 + "  |  ";
            res=res+"Marks of EMF is:"+s6 + "  |  ";
            res=res+"Marks of DC is:"+s7 + "  |  ";
            res=res+"Marks of FJP is:"+s8 + "  |   ";
            res=res+"Marks of DBMS is:"+s9 + "  |  ";


      // Shows a Pop up Message when save button is clicked
      JOptionPane.showMessageDialog(f,"Successfully Saved,:)");
      f.dispose();
      new ResultForm(res);
   }
 }
});

// Action listener to close the form
```

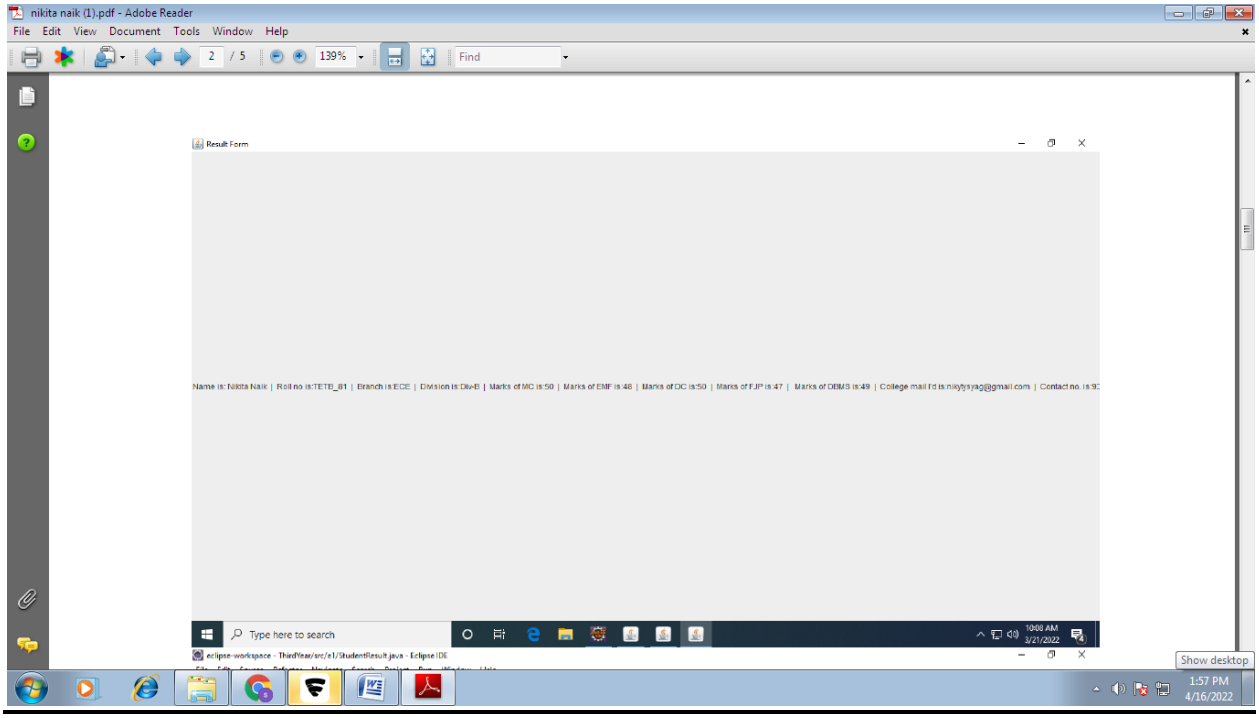
```
    b2.addActionListener(new ActionListener() {
       public void actionPerformed(ActionEvent e)
       {
          f.dispose();
       }
    });

    // Default method for closing the frame
    f.addWindowListener(new WindowAdapter() {
       public void windowClosing(WindowEvent e)
       {
          System.exit(0);
       }
    });

    // Adding the created objects
    // to the frame
    f.add(l1);
    f.add(t1);
    f.add(l2);
    f.add(t2);
    f.add(l3);
    f.add(j1);
    f.add(l4);
    f.add(j2);
    f.add(l5);
    f.add(t3);
    f.add(l6);
    f.add(t4);
    f.add(l7);
    f.add(t5);
    f.add(l8);
    f.add(t6);
    f.add(l9);
    f.add(t7);
    f.add(b1);
    f.add(b2);

    f.setLayout(null);
    f.setSize(3000, 3000);
    f.setVisible(true);
 }
 // Driver code
 public static void main(String args[])
```

```
  {
     StudentInfo();
  }
}

class ResultForm extends JFrame {

public ResultForm(String res){
super("Result Form");
Label l1=new Label(res);
add(l1);
setSize(3000,3000);
setVisible(true);

}

}
```

OUTPUT:




nikita naik (1).pdf - Adobe Reader
File Edit View Document Tools Window Help
Student Result Form
Student Name: Nikita Naik
Div : Div-B
Contact No. : 9307775548
Branch: ECE
Roll no: TETB_81
College Mail Id: nikytysyag@gmail.com
EMF: 48
MC: 50
DC: 47
FJP: 50
DBMS: 49
Save
Close
Message
Successfully Saved.:)
OK


nikita naik (1).pdf - Adobe Reader
File Edit View Document Tools Window Help
Result Form
Name is: Nikita Naik | Roll no is:TETB_81 | Branch is:ECE | Division is:Div-B | Marks of MC is:50 | Marks of EMF is:48 | Marks of DC is:50 | Marks of FJP is:47 | Marks of DBMS is:49 | College mail Id is:nikytysyag@gmail.com | Contact no. is:9

Conclusion:

References:

Herbert Schildt , "Java : The Complete Reference" Tata McGraw-Hill (7th Edition).

Questions:

1. What is Java Swing?
2. What is AWT?
3. What is JFC?
4. What are the Differences Between Swing And AWT?
5. Why Swing components are called lightweight components?