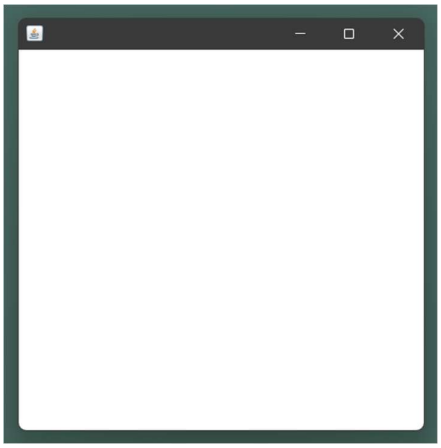
MODULE: 4

Practical-1: Write a program to demonstrate different Window handling events.

```
import java.awt.*;
import java.awt.event.WindowEvent;
import java.awt.event.WindowListener;

public class OneWindowListener extends Frame implements WindowListener {
   OneWindowListener() {
      addWindowListener(this);
      setSize (400, 400);
      setLayout (null);
      setVisible (true);
   }
   public static void main(String[] args) {
      new OneWindowListener();
   }
   public void windowActivated (WindowEvent arg0) {
      System.out.println("activated");
   }
   public void windowClosed (WindowEvent arg0) {
      System.out.println("closed");
   }
   public void windowClosing (WindowEvent arg0) {
      System.out.println("closing");
      dispose();
   }
   public void windowDeactivated (WindowEvent arg0) {
      System.out.println("deactivated");
   }
   public void windowDeiconified (WindowEvent arg0) {
      System.out.println("deiconified");
```

```
    }
    public void windowIconified(WindowEvent arg0) {
        System.out.println("iconified");
    }
    public void windowOpened(WindowEvent arg0) {
        System.out.println("opened");
    }
}
```

Output:



```
activated
opened
deactivated
activated
closing
deactivated
closed
```

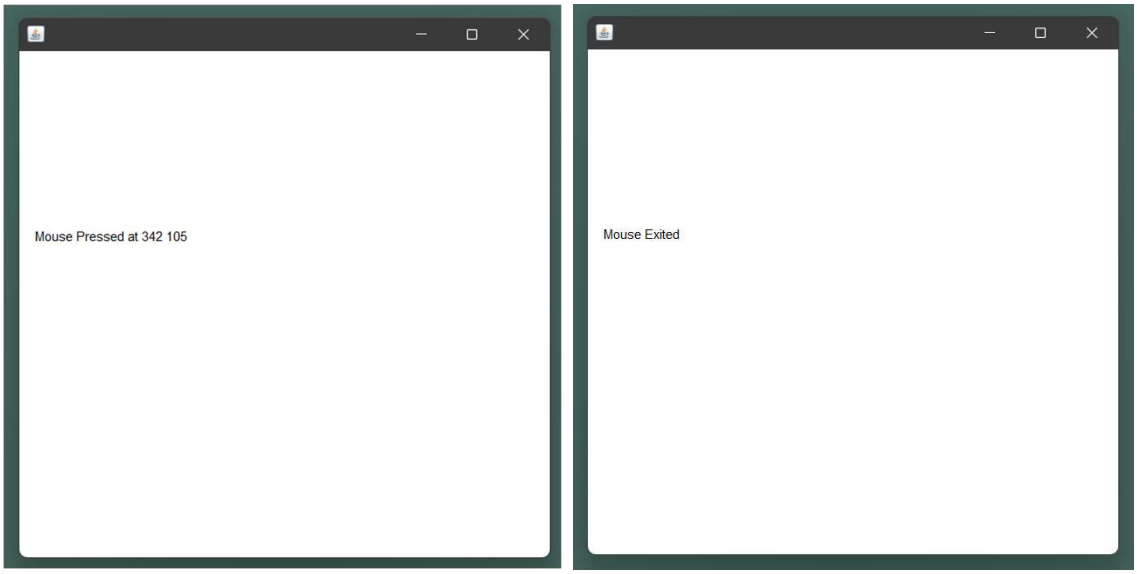
Practical-2: Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed, mouseReleased() and mouseDragged().

// Mouse Listener

```
import java.awt.*;
import java.awt.event.*;
public class TwoMouseListener extends Frame implements MouseListener{
   Label l;
   TwoMouseListener(){
      addMouseListener(this);
      l=new Label();
      l.setBounds(20,50,300,300);
      add(l);
      setSize(500,500);
      setLayout(null);
      setVisible(true);
   }
   public static void main(String[] args) {
      new TwoMouseListener();
   }
   public void mouseClicked(MouseEvent e) {
      l.setText("Mouse Clicked at " + e.getX() + " " + e.getY());
      System.out.println(getAlignmentX() + " " + getAlignmentY());
   }
   public void mousePressed(MouseEvent e) {
      l.setText("Mouse Pressed at " + getX() + " " + getY());
      System.out.println(getAlignmentX() + " " + getAlignmentY());
   }
   public void mouseEntered(MouseEvent e) {
      l.setText("Mouse Entered");
   }
   public void mouseExited(MouseEvent e) {
```

```
        l.setText("Mouse Exited");
    }
    public void mouseReleased(MouseEvent e) {
        l.setText("Mouse Released");
    }
}
```

Output:



// **MouseMotionListener**

```
import java.awt.*;
import java.awt.event.*;
public class TwoMouseMotionListener extends Frame implements MouseMotionListener{
    Label l;
    TwoMouseMotionListener(){
        addMouseMotionListener(this);
        l=new Label();
        l.setBounds(20,50,100,20);
        add(l);
        setSize(500,500);
```

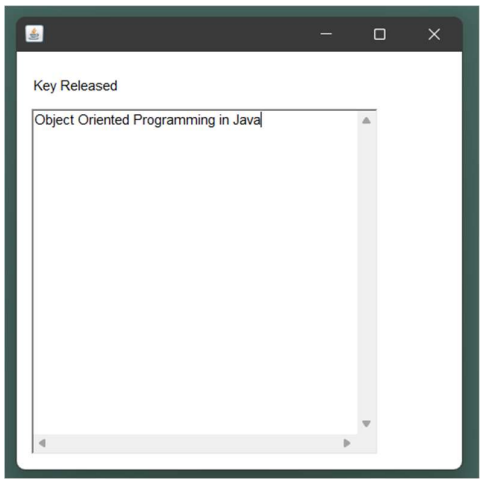
```
        setLayout(null);
        setVisible(true);
    }
    public static void main(String[] args) {
        new TwoMouseMotionListener();
    }
    public void mouseDragged(MouseEvent e) {
        Graphics g=getGraphics();
        g.setColor(Color.RED);
        g.fillOval(e.getX(),e.getY(),20,20);
    }
    public void mouseMoved(MouseEvent e) {
        l.setText("mouse is moved to point " + e.getX() + " " + e.getY());
    }
}
```

Output:

Practical-3: Write a program to demonstrate different keyboard handling events.

```
import java.awt.*;
import java.awt.event.*;
public class ThreeKeyListener extends Frame implements KeyListener {
   Label l;
   TextArea area;
   ThreeKeyListener() {
      l = new Label();
      l.setBounds(20, 50, 100, 20);
      area = new TextArea();
      area.setBounds(20, 80, 300, 300);
      area.addKeyListener(this);
      add(l);
      add(area);
      setSize(400, 400);
      setLayout(null);
      setVisible(true);
   }
   public void keyPressed(KeyEvent e) {
      l.setText("Key Pressed");
   }
   public void keyReleased(KeyEvent e) {
      l.setText("Key Released");
   }
   public void keyTyped(KeyEvent e) {
      l.setText("Key Typed");
   }
   public static void main(String[] args) {
      new ThreeKeyListener();
   }
}
```

Output



Practical-4: Write a program to generate a window without an applet window using main() function.

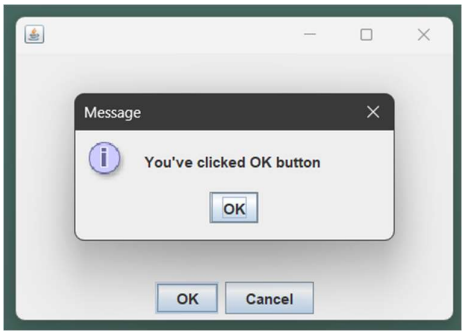
```
import java.awt.Frame;
public class FourApplet extends Frame{
   FourApplet(String title){
      super();
      this.setTitle(title);
      this.setVisible(true);
   }

   public static void main(String args[]){
      FourApplet window = new FourApplet("Create Window Example");
   }
}
```

Output:

Practical-5: Write a program to demonstrate the use of push buttons.

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

public class FivePush {
   public static void main(String[] args) {
      final JFrame frame = new JFrame();
      JButton btnOK = new JButton("OK");
      btnOK.addActionListener(
            new ActionListener(){
               public void actionPerformed(ActionEvent e) {
                  JOptionPane.showMessageDialog(frame,"You've clicked OK button");
               }
            });
      JButton btnCancel = new JButton("Cancel");
      btnCancel.addActionListener(
            new ActionListener(){
               public void actionPerformed(ActionEvent e) {
                  JOptionPane.showMessageDialog(frame,"You've clicked Cancel button"
                  );
               }
            });
      JPanel buttonPanel = new JPanel( );
      buttonPanel.add(btnOK);
      buttonPanel.add(btnCancel);
      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.setSize(300, 200);
      frame.getContentPane( ).add(buttonPanel,BorderLayout.SOUTH);
      frame.setVisible(true);
   }
}
```

Output:

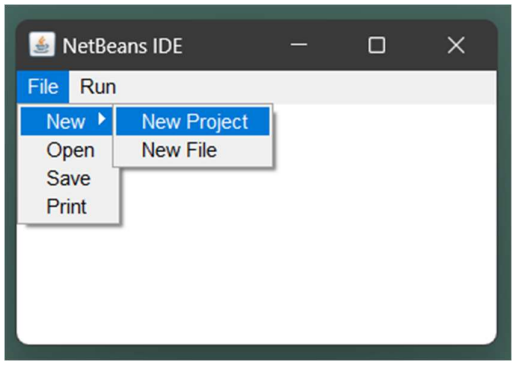


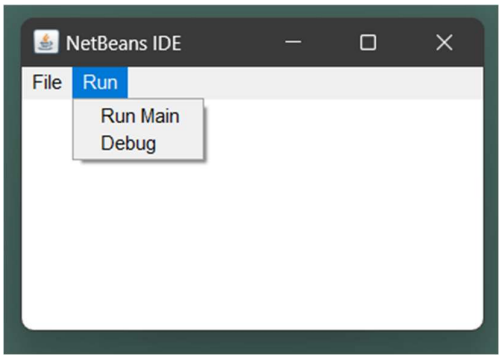
Practical-6: WAP to create a Menu using the frame.

```
import java.awt.*;
class MenuExample {
   MenuExample(){
      Frame f= new Frame("NetBeans IDE");
      MenuBar mb=new MenuBar();

      // File Menu
      Menu menu=new Menu("File");
      Menu submenu=new Menu("New");
      MenuItem i1=new MenuItem("New Project");
      MenuItem i2=new MenuItem("New File");
      MenuItem i3=new MenuItem("Open");
      MenuItem i4=new MenuItem("Save");
      MenuItem i5=new MenuItem("Print");

      submenu.add(i1);
      submenu.add(i2);
      menu.add(submenu);
      menu.add(i3);
      menu.add(i4);
      menu.add(i5);
      mb.add(menu);

      // Run Menu
      Menu Run=new Menu("Run");
      MenuItem run=new MenuItem("Run Main");
      MenuItem debug=new MenuItem("Debug");

      Run.add(run);
      Run.add(debug);
      mb.add(Run);
```

```
        f.setMenuBar(mb);
        f.setSize(300,200);
        f.setLayout(null);
        f.setVisible(true);
    }
    public static void main(String args[]) {
        new MenuExample();
    }
}
```

Output:





Practical-7: WAP to create a Frame that display the student information.

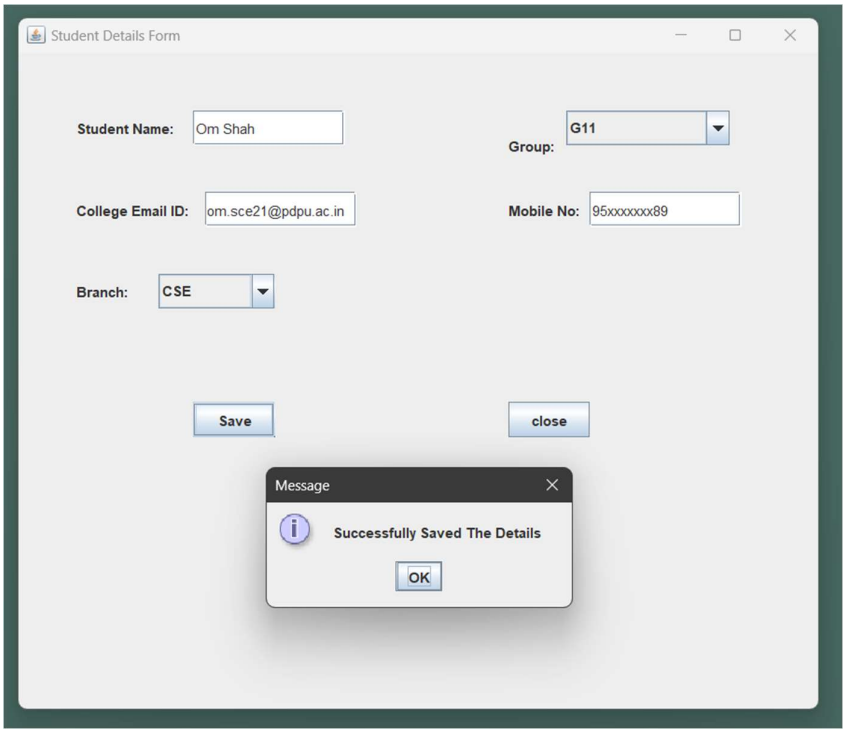
```
import javax.swing.*;
import java.awt.event.*;
import java.io.*;

public class SevenStudent {
   public static void StudentInfo() {
      JFrame f = new JFrame("Student Details Form");

      JLabel l1, l2, l3, l4, l5;
      JTextField t1, t2, t3;
      JComboBox j1, j2;
      JButton b1, b2;

      l1 = new JLabel("Student Name:");
      l1.setBounds(50, 50, 100, 30);
      l2 = new JLabel("College Email ID:");
      l2.setBounds(50, 120, 120, 30);
      l3 = new JLabel("Branch:");
      l3.setBounds(50, 190, 50, 30);
      l4 = new JLabel("Group:");
      l4.setBounds(420, 50, 70, 60);
      l5 = new JLabel("Mobile No:");
      l5.setBounds(420, 120, 70, 30);

      t1 = new JTextField();
      t1.setBounds(150, 50, 130, 30);
      t2 = new JTextField();
      t2.setBounds(160, 120, 130, 30);
      t3 = new JTextField();
      t3.setBounds(490, 120, 130, 30);
```

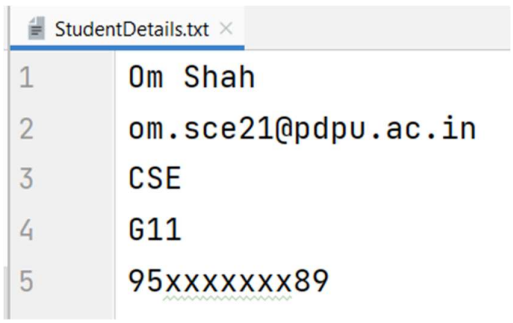
```
String s1[]  = { " ", "CSE", "ECE", "EEE", "CIVIL", "MEC", "Others" };
String s2[]  = { " ", "G1", "G2", "G3", "G4", "G5", "G6", "G7", "G8", "G9", "G10",
"G11", "G12" };

j1 = new JComboBox(s1);
j1.setBounds(120, 190, 100, 30);
j2 = new JComboBox(s2);
j2.setBounds(470, 50, 140, 30);

b1 = new JButton("Save");
b1.setBounds(150, 300, 70, 30);
b2 = new JButton("close");
b2.setBounds(420, 300, 70, 30);

b1.addActionListener(new ActionListener() {
   public void actionPerformed(ActionEvent e) {
      String s1 = t1.getText();
      String s2 = t2.getText();
      String s3 = j1.getSelectedItem() + "";
      String s4 = j2.getSelectedItem() + "";
      String s5 = t3.getText();
      if (e.getSource() == b1) {
         try {
            FileWriter w= new FileWriter("StudentDetails.txt", true);
            w.write(s1 + "\n");
            w.write(s2 + "\n");
            w.write(s3 + "\n");
            w.write(s4 + "\n");
            w.write(s5 + "\n");
            w.close();
         }
         catch (Exception ae) {
```

```
            System.out.println(ae);
          }
        }

        JOptionPane.showMessageDialog(f,"Successfully Saved" + " The Details");
    }
});

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

f.addWindowListener(new WindowAdapter() {
    public void windowClosing(WindowEvent e)
    {
        System.exit(0);
    }
});

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(b1);
        f.add(b2);
        f.setLayout(null);
        f.setSize(700, 600);
        f.setVisible(true);
    }
    public static void main(String args[]) {
        StudentInfo();
    }
}
```

Output:

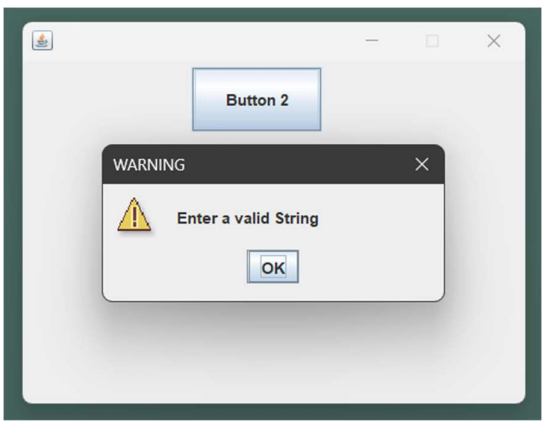




Practical-8: WAP to create a Dialogbox.

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

class DialogueClass extends JFrame implements ActionListener {
   JButton b1;
   DialogueClass() {
      this.setLayout(null);
      b1 = new JButton("Button 2");
      b1.setBounds(130, 05, 100, 50);
      this.add(b1);
      b1.addActionListener(this);
   }

   public void actionPerformed(ActionEvent evt) {
      if (evt.getSource() == b1) {
         JOptionPane.showMessageDialog(this, "Enter a valid String",
"WARNING", JOptionPane.WARNING_MESSAGE);
      }
   }
}

class EightDialogue {
   public static void main(String args[]) {
      DialogueClass f = new DialogueClass();
      f.setBounds(200, 200, 400, 300);
      f.setResizable(false);
      f.setVisible(true);
   }
}
```

Output



Practical-9: WAP to implement the FlowLayout and BorderLayout.

// Flow Layout

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

class Layout extends JFrame {
   JLabel l1, l2, l3, l4, l5;
   public Layout() {
      setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      FlowLayout layout = new FlowLayout();
      this.setLayout(layout);
      l1 = new JLabel("Label 1 ");
      l2 = new JLabel("Label 2 ");
      l3 = new JLabel("Label 3 ");
      l4 = new JLabel("Label 4 ");
      l5 = new JLabel("Label 5 ");
      this.add(l1);
      this.add(l2);
      this.add(l3);
      this.add(l4);
      this.add(l5);
   }
}

class NineFlowLayout {
   public static void main(String[] args) {
      Layout f = new Layout();
      f.setTitle("Example of FlowLayout");
      f.setBounds(200, 100, 600, 400);
      f.setVisible(true);
   }
}
```

Output

// Border Layout

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

class BoderLayoutDemo extends JFrame {
    BoderLayoutDemo() {
        JPanel pa = new JPanel();
        pa.setLayout(new BorderLayout());
        pa.add(new JButton("Welcome"), BorderLayout.NORTH);
        pa.add(new JButton("OOP"), BorderLayout.SOUTH);
        pa.add(new JButton("Layout"), BorderLayout.EAST);
        pa.add(new JButton("Border"), BorderLayout.WEST);
        pa.add(new JButton("Java"), BorderLayout.CENTER);
        add(pa);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setSize(300, 300);
        setVisible(true);
    }
}

class NineBorderLayout {

    // Driver code
    public static void main(String[] args) {
        new BoderLayoutDemo();
    }
}
```

Output

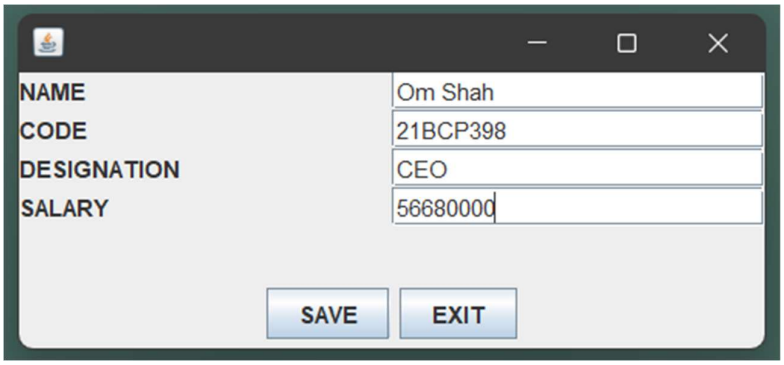
Practical-10: WAP to implement the GridLayout and CardLayout.

// Grid Layout

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

public class TenGridLayout extends JFrame {
   TenGridLayout() {
      JPanel p1 = new JPanel();
      p1.setLayout(new GridLayout(4, 2));
      FlowLayout layout = new FlowLayout();
      JPanel p2 = new JPanel();
      p2.setLayout(layout);
      JLabel one, two, three, four;
      JTextField tname, tsalary, tcode, tdesig;
      JButton buttonSave, buttonExit;

      one = new JLabel("NAME");
      tname = new JTextField(20);
      two = new JLabel("CODE");
      tcode = new JTextField(20);
      three = new JLabel("DESIGNATION");
      tdesig = new JTextField(20);
      four = new JLabel("SALARY");
      tsalary = new JTextField(20);
      buttonSave = new JButton("SAVE");
      buttonExit = new JButton("EXIT");
      p1.add(one);
      p1.add(tname);
      p1.add(two);
      p1.add(tcode);
      p1.add(three);
      p1.add(tdesig);
```

```
        p1.add(four);
        p1.add(tsalary);
        p2.add(buttonSave);
        p2.add(buttonExit);
        add(p1, "North");
        add(p2, "South");
        setVisible(true);
        this.setSize(400, 180);
    }
    public static void main(String args[]) {
        new TenGridLayout();
    }
}
```

Output:

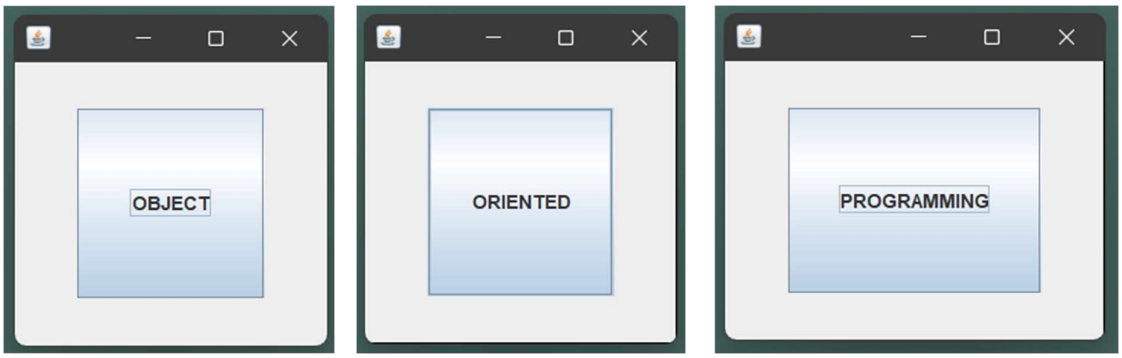


// Card Layout

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

public class TenCardLayout extends JFrame implements ActionListener {
    CardLayout card;
    JButton b1, b2, b3;
    Container c;
```

```
    TenCardLayout(){
        c = getContentPane();
        card = new CardLayout(40, 30);
        c.setLayout(card);
        b1 = new JButton("OBJECT");
        b2 = new JButton("ORIENTED");
        b3 = new JButton("PROGRAMMING");
        b1.addActionListener(this);
        b2.addActionListener(this);
        b3.addActionListener(this);
        c.add("a", b1);
        c.add("b", b2);
        c.add("c", b3);
    }
    public void actionPerformed(ActionEvent e) {
        card.next(c);
    }
    public static void main(String[] args) {
        TenCardLayout cl = new TenCardLayout();
        cl.setSize(400, 400);
        cl.setVisible(true);
        cl.setDefaultCloseOperation(EXIT_ON_CLOSE);
    }
}
```

Output:



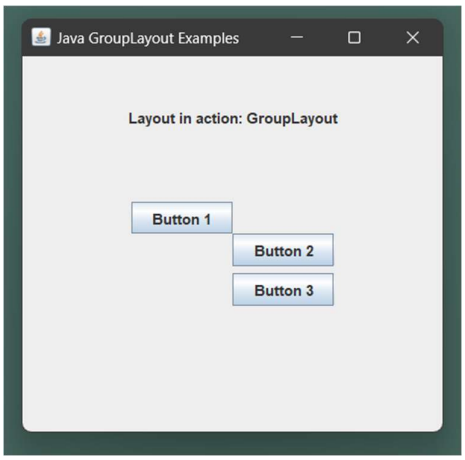
Practical-11: WAP to implement the GroupLayout and BoxLayout.

// Group Layout

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

public class ElevenGroupLayout {
   private JFrame mainFrame;
   private JLabel headerLabel, statusLabel, msglabel;
   private JPanel controlPanel;
   public ElevenGroupLayout(){
      prepareGUI();
   }
   public static void main(String[] args){
      ElevenGroupLayout GroupLayoutDemo = new ElevenGroupLayout();
      GroupLayoutDemo.showGroupLayoutDemo();
   }
   private void prepareGUI(){
      mainFrame = new JFrame("Java GroupLayout Examples");
      mainFrame.setSize(400, 400);
      mainFrame.setLayout(new GridLayout(3, 1));
      headerLabel = new JLabel("", JLabel.CENTER);
      statusLabel = new JLabel("", JLabel.CENTER);
      statusLabel.setSize(350, 100);
      mainFrame.addWindowListener(new WindowAdapter(){
         public void windowClosing(WindowEvent windowEvent)
         {
            System.exit(0);
         }
      });
      controlPanel = new JPanel();
      controlPanel.setLayout(new FlowLayout());
```

```
        mainFrame.add(headerLabel);
        mainFrame.add(controlPanel);
        mainFrame.add(statusLabel);
        mainFrame.setVisible(true);
    }
    private void showGroupLayoutDemo(){
        headerLabel.setText("Layout in action: GroupLayout");
        JPanel panel = new JPanel();
        panel.setSize(200, 200);
        GroupLayout layout = new GroupLayout(panel);
        layout.setAutoCreateGaps(true);
        layout.setAutoCreateContainerGaps(true);
        JButton btn1 = new JButton("Button 1");
        JButton btn2 = new JButton("Button 2");
        JButton btn3 = new JButton("Button 3");
        layout.setHorizontalGroup(layout.createSequentialGroup()
                .addComponent(btn1)
                .addGroup(layout.createSequentialGroup()
                        .addGroup(layout.createParallelGroup(GroupLayout.Alignment.LEADING)
                                .addComponent(btn2)
                                .addComponent(btn3))));

        layout.setVerticalGroup(layout.createSequentialGroup()
                .addComponent(btn1)
                .addComponent(btn2)
                .addComponent(btn3));
        panel.setLayout(layout);
        controlPanel.add(panel);
        mainFrame.setVisible(true);
    }
}
```

Output

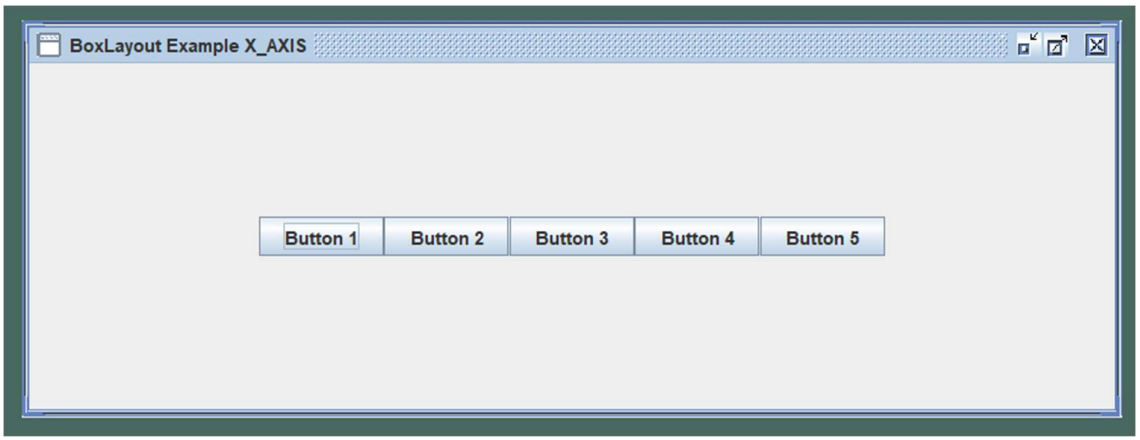


// Box Layout

```
import javax.swing.JFrame;
import javax.swing.JButton;
import javax.swing.BoxLayout;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import java.awt.Insets;

public class ElevenBoxLayout {
   public static void main(String[] args){
      JFrame.setDefaultLookAndFeelDecorated(true);
      JFrame frame = new JFrame("BoxLayout Example X_AXIS");
      JButton jbtn1, jbtn2, jbtn3, jbtn4, jbtn5;
      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

      JPanel panel = new JPanel();
      BoxLayout boxlayout = new BoxLayout(panel, BoxLayout.X_AXIS);

      panel.setLayout(boxlayout);
      panel.setBorder(new EmptyBorder(new Insets(100, 150, 100, 150)));

      jbtn1 = new JButton("Button 1");
      jbtn2 = new JButton("Button 2");
      jbtn3 = new JButton("Button 3");
      jbtn4 = new JButton("Button 4");
      jbtn5 = new JButton("Button 5");

      panel.add(jbtn1);
      panel.add(jbtn2);
      panel.add(jbtn3);
      panel.add(jbtn4);
      panel.add(jbtn5);
```

```
        frame.add(panel);
        frame.pack();
        frame.setVisible(true);
    }
}
```

Output:



Practical-12: Write a program that demonstrates the life cycle of an applet.

```
import java.applet.Applet;
import java.awt.Graphics;
public class TwelveApplet extends Applet {
   public void init() {
      System.out.println("In init()");
   }
   public void start() {
      System.out.println("In start()");
   }
   public void paint(Graphics g) {
      System.out.println("In paint()");
   }
   public void stop() {
      System.out.println("In stop()");
   }
   public void destroy() {
      System.out.println("In destroy()");
   }
}
```

Practical-13: WAP to demonstrate System clock.

```
import java.time.*;
public class ThirteenClock {
   public static void main(String[] args) {
      Clock c = Clock.systemDefaultZone();
      System.out.println(c.getZone());
      System.out.println(c.instant());
   }
}
```

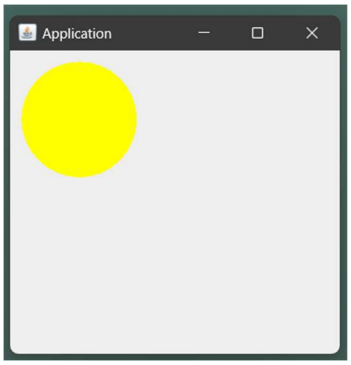
Output:

```
Asia/Calcutta
2022-11-16T13:01:07.564089900Z
```

Practical-14: WAP to demonstrate Painting in applet.

```
import java.awt.*;
import javax.swing.*;
class FourteenPaint extends JPanel {
   JButton jb;
   JTextField jt;
   FourteenPaint() {
      JFrame app = new JFrame("Application");
      app.add(this);
      app.setSize(300,300);
      app.setLocationRelativeTo(null);
      app.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      app.setVisible(true);
   }
   public void paintComponent(Graphics g){
      super.paintComponent(g);
      g.setColor(Color.YELLOW);
      g.fillOval(10,10,100,100);

   }
   public static void main(String[] args) {
      new FourteenPaint();
   }
}
```

Output:



Practical-15: WAP to demonstrate Graphics in applet.

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

public class FifteenGraphics extends JPanel {
   FifteenGraphics() {
      JFrame app = new JFrame("Shapes in Graphics in Java");
      app.add(this);
      app.setSize(400,400);
      app.setLocationRelativeTo(null);
      app.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      app.setVisible(true);
   }
   public void paint(Graphics g){
      g.setColor(Color.red);
      g.drawString("Welcome",50, 50);
      g.drawLine(20,30,20,300);
      g.drawRect(70,100,30,30);
      g.fillRect(170,100,30,30);
      g.drawOval(70,200,30,30);

      g.setColor(Color.pink);
      g.fillOval(170,200,30,30);
      g.drawArc(90,150,30,30,30,270);
      g.fillArc(270,150,30,30,0,180);
   }
   public static void main(String[] args) {
      new FifteenGraphics();
   }
}
```

Output