```java
package demo.gui;

import java.awt.*;
import javax.swing.*;
import javax.swing.border.*;
public class BoxLayoutPane extends JPanel {
  public BoxLayoutPane() {
    this.setLayout(new BorderLayout());
    this.setBorder(new EmptyBorder(10, 10, 10, 10));
    Box row = Box.createHorizontalBox();
    for (int i = 0; i < 4; i++) {
      JButton b = new JButton("B" + i);
      b.setFont(new Font("serif", Font.BOLD, 12 + i * 2));
      row.add(b);
    }
    this.add(row, BorderLayout.NORTH);
    JPanel col = new JPanel();
    col.setLayout(new BoxLayout(col, BoxLayout.Y_AXIS));
    col.setBorder(new TitledBorder(new EtchedBorder(), "Column"));
    for (int i = 0; i < 4; i++) {
      JButton b = new JButton("Button " + i);
      b.setFont(new Font("sanserif", Font.BOLD, 10 + i * 2));
      col.add(b);
    }
    this.add(col, BorderLayout.EAST);

    Box buttonbox = Box.createHorizontalBox();
    buttonbox.add(Box.createHorizontalGlue());
    buttonbox.add(new JButton("Okay"));
    buttonbox.add(Box.createHorizontalGlue());
    buttonbox.add(new JButton("Cancel"));
    buttonbox.add(Box.createHorizontalGlue());
    buttonbox.add(new JButton("Help"));
    buttonbox.add(Box.createHorizontalGlue());
    this.add(buttonbox, BorderLayout.SOUTH);

    JTextArea textarea = new JTextArea();
    textarea.setText("This component has 12-pixel margins on left and top"
        + " and has 72-pixel margins on right and bottom.");
    textarea.setLineWrap(true);
    textarea.setWrapStyleWord(true);

    Box fixedcol = Box.createVerticalBox();
    fixedcol.add(Box.createVerticalStrut(12));
    fixedcol.add(textarea);
    fixedcol.add(Box.createVerticalStrut(72));

    Box fixedrow = Box.createHorizontalBox();
    fixedrow.add(Box.createHorizontalStrut(12));
    fixedrow.add(fixedcol);
    fixedrow.add(Box.createHorizontalStrut(72));
    this.add(fixedrow, BorderLayout.CENTER);
  }
```
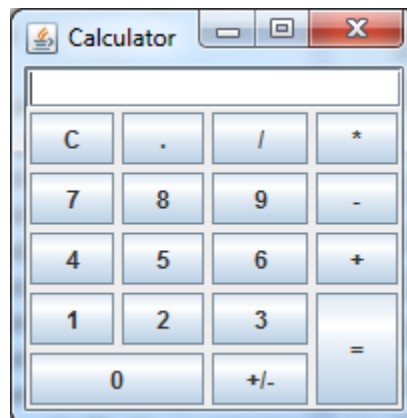
```java
  public static void main(String[] a) {
    JFrame f = new JFrame();
    f.addWindowListener(new WindowAdapter() {
      public void windowClosing(WindowEvent e) {
        System.exit(0);
      }
    });
    f.setTitle("Layout Manager");
    f.setContentPane(new BoxLayoutPane());
    f.pack();
    f.setLocationRelativeTo(null);
    f.setVisible(true);
  }

}
```

Bài Tập 9.   Thực hành Layout Managers - Sử dụng GridBagLayout và GridBagConstraints thiết kế các giao diện sau, thêm phần xử lý sự kiện khi tắt cửa sổ.

a.


```java
package demo.gui;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
public class GridBagTest
{
    private String[] buttonText = { "C", ".", "/", "*", "7", "8", "9", "-
", "4", "5", "6", "+", "1", "2", "3", "=", "0", "+/-" };
    private JButton[] button = new JButton[18];
    private int counter = 0;

    private void createAndDisplayGUI()
    {
        JFrame frame = new JFrame("Calculator");
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        JPanel contentPane = new JPanel();
        contentPane.setLayout(new BorderLayout());
```