

```
// CalcView.java - View component
// Presentation only. No user actions. No direct interaction with model.
// Fred Swartz -- December 2004
// Paolo Bucci -- November 2009 (modified)

import java.awt.FlowLayout;
import java.awt.event.ActionListener;

import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JTextField;

public class CalcView extends JFrame {

    //... Components
    private JTextField m_userInputTf = new JTextField(5);
    private JTextField m_totalTf     = new JTextField(20);
    private JButton    m_multiplyBtn = new JButton("Multiply");
    private JButton    m_clearBtn    = new JButton("Clear");

    //===== constructor
    /** Constructor */
    public CalcView() {
        //... Initialize components
        m_totalTf.setEditable(false);

        //... Layout the components.
        JPanel content = new JPanel();
        content.setLayout(new FlowLayout());
        content.add(new JLabel("Input"));
        content.add(m_userInputTf);
        content.add(m_multiplyBtn);
        content.add(new JLabel("Total"));
        content.add(m_totalTf);
        content.add(m_clearBtn);

        //... finalize layout
        this.setContentPane(content);
        this.pack();

        this.setTitle("Simple Calc - MVC");
        // The window closing event should probably be passed to the
        // Controller in a real program, but this is a short example.
        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public String getUserInput() {
        return m_userInputTf.getText();
    }

    public void setTotal(String newTotal) {
        m_totalTf.setText(newTotal);
    }

    public void showError(String errMessage) {
        JOptionPane.showMessageDialog(this, errMessage);
    }

    public void addMultiplyListener(ActionListener mal) {
        m_multiplyBtn.addActionListener(mal);
    }
}
```

```
public void addClearListener(ActionListener cal) {  
    m_clearBtn.addActionListener(cal);  
}  
}
```