

```
// structure/calc-mvc/CalcController.java - Controller
//   Handles user interaction with listeners.
//   Calls View and Model as needed.
// Fred Swartz -- December 2004

import java.awt.event.*;

public class CalcController {
    //... The Controller needs to interact with both the Model and View.
    private CalcModel m_model;
    private CalcView m_view;

    //===== constructor
    /** Constructor */
    CalcController(CalcModel model, CalcView view) {
        m_model = model;
        m_view = view;

        //... Add listeners to the view.
        view.addMultiplyListener(new MultiplyListener());
        view.addClearListener(new ClearListener());
    }

    //////////////////////////////////// inner class MultiplyListener
    /** When a multiplication is requested.
    * 1. Get the user input number from the View.
    * 2. Call the model to multiply by this number.
    * 3. Get the result from the Model.
    * 4. Tell the View to display the result.
    * If there was an error, tell the View to display it.
    */
    class MultiplyListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            String userInput = "";
            try {
                userInput = m_view.getUserInput();
                m_model.multiplyBy(userInput);
                m_view.setTotal(m_model.getValue());
            } catch (NumberFormatException nfex) {
                m_view.showError("Bad input: '" + userInput + "'");
            }
        }
    }
    //end inner class MultiplyListener

    //////////////////////////////////// inner class ClearListener
    /** 1. Reset model.
    * 2. Reset View.
    */
    class ClearListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            m_model.reset();
            m_view.reset();
        }
    }
    // end inner class ClearListener
}
```