



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

public class Calculator{

    public static void main( String args[] ){

        // Create JFrame
        JFrame myFrame = new JFrame( "Calculator" );
        myFrame.setSize( 400, 400 );
        myFrame.setLayout( new BorderLayout() );

        // Create Button panel
        JPanel butPanel = new JPanel();
        butPanel.setLayout( new GridLayout( 5, 3 ) );

        myFrame.add( butPanel, BorderLayout.CENTER );

        // Create buttons
        for( int i = 0; i < 9; i++ ){

            JButton b = new JButton( "" + ( i + 1 ) );
            butPanel.add( b );

        }

        JButton b2 = new JButton( "X" );
        butPanel.add( b2 );

        JButton b3 = new JButton( "0" );
        butPanel.add( b3 );

        JButton b4 = new JButton( "=" );
        butPanel.add( b4 );

        JButton b5 = new JButton( "+" );
        butPanel.add( b5 );

        JButton b6 = new JButton( "-" );
        butPanel.add( b6 );

        JButton b7 = new JButton( "/" );
        butPanel.add( b7 );

        // Create text area
        JTextField tf = new JTextField();
        myFrame.add( tf, BorderLayout.NORTH );

        // Make the frame visible
        myFrame.setVisible( true );

    }

}
```

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

public class Calculator2 implements ActionListener{ // Changed to add listener

    // Moved to here as instance variables
    JTextField tf;

    // New method
    public void actionPerformed( ActionEvent e ){

        // JOptionPane.showMessageDialog( null, "Hello" );

        // JOptionPane.showMessageDialog( null, "Hello " + e.getActionCommand() );

        // If a number is pressed
        if(     e.getActionCommand().equals( "1" ) ||
              e.getActionCommand().equals( "2" ) ||
              e.getActionCommand().equals( "3" ) ||
              e.getActionCommand().equals( "4" ) ||
              e.getActionCommand().equals( "5" ) ||
              e.getActionCommand().equals( "6" ) ||
              e.getActionCommand().equals( "7" ) ||
              e.getActionCommand().equals( "8" ) ||
              e.getActionCommand().equals( "9" ) ||
              e.getActionCommand().equals( "0" ) ){

            // Adding that number to the end of the string
            tf.setText( tf.getText() + e.getActionCommand() );
        }

    }

    public static void main( String args[] ){

        // Create an instance of myself, so it can be an object
        Calculator2 c = new Calculator2();

        c.runIt();

    }

    public void runIt(){

        // Create JFrame
        JFrame myFrame = new JFrame( "Calculator" );
        myFrame.setSize( 400, 400 );
        myFrame.setLayout( new BorderLayout() );

        // Create Button panel
        JPanel butPanel = new JPanel();
        butPanel.setLayout( new GridLayout( 5, 3 ) );

        myFrame.add( butPanel, BorderLayout.CENTER );

        // Create buttons
```

```
for( int i = 0; i < 9; i++ ){

    JButton b = new JButton( "" + ( i + 1 ) );
    b.addActionListener( this );    // Add this to each button
    butPanel.add( b );

}

JButton b2 = new JButton( "X" );
b2.addActionListener( this );
butPanel.add( b2 );

JButton b3 = new JButton( "0" );
b3.addActionListener( this );
butPanel.add( b3 );

JButton b4 = new JButton( "=" );
b4.addActionListener( this );
butPanel.add( b4 );

JButton b5 = new JButton( "+" );
b5.addActionListener( this );
butPanel.add( b5 );

JButton b6 = new JButton( "-" );
b6.addActionListener( this );
butPanel.add( b6 );

JButton b7 = new JButton( "/" );
b7.addActionListener( this );
butPanel.add( b7 );

// Create text area
tf = new JTextField();
myFrame.add( tf, BorderLayout.NORTH );

// Make the frame visible
myFrame.setVisible( true );

}

}
```

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

public class Calculator3 implements ActionListener{ // Changed to add listener

    // Moved to here as instance variables
    JTextField tf;
    int temp;
    int type;

    // Constants
    static final int PLUS = 0;
    static final int MINUS = 1;
    static final int DIV = 2;
    static final int MULT = 3;

    // New method
    public void actionPerformed( ActionEvent e ){

        // JOptionPane.showMessageDialog( null, "Hello" );

        // JOptionPane.showMessageDialog( null, "Hello " + e.getActionCommand() );

        // If a number is pressed
        if(     e.getActionCommand().equals( "1" ) ||
              e.getActionCommand().equals( "2" ) ||
              e.getActionCommand().equals( "3" ) ||
              e.getActionCommand().equals( "4" ) ||
              e.getActionCommand().equals( "5" ) ||
              e.getActionCommand().equals( "6" ) ||
              e.getActionCommand().equals( "7" ) ||
              e.getActionCommand().equals( "8" ) ||
              e.getActionCommand().equals( "9" ) ||
              e.getActionCommand().equals( "0" ) ){

            // Adding that number to the end of the string
            tf.setText( tf.getText() + e.getActionCommand() );
        }

        // Handle addition
        else if( e.getActionCommand().equals( "+" ) ){

            // Store the decimal value in temp store
            temp = Integer.parseInt( tf.getText() );

            // Store operator type
            type = PLUS;          // Changing this one for different buttons

            // Clear the display
            tf.setText( "" );
        }

        // Handle equals
        else if( e.getActionCommand().equals( "=" ) ){
```

```
// If adding
if( type == PLUS ){

    int temp2 = Integer.parseInt( tf.getText() );
    temp2 = temp2 + temp;    // Changing this one too

    tf.setText( "" + temp2 );

}

}

}

public static void main( String args[] ){

    // Create an instance of myself, so it can be an object
    Calculator3 c = new Calculator3();

    c.runIt();

}

public void runIt(){

    // Create JFrame
    JFrame myFrame = new JFrame( "Calculator" );
    myFrame.setSize( 400, 400 );
    myFrame.setLayout( new BorderLayout() );

    // Create Button panel
    JPanel butPanel = new JPanel();
    butPanel.setLayout( new GridLayout( 5, 3 ) );

    myFrame.add( butPanel, BorderLayout.CENTER );

    // Create buttons
    for( int i = 0; i < 9; i++ ){

        JButton b = new JButton( "" + ( i + 1 ) );
        b.addActionListener( this );    // Add this to each button
        butPanel.add( b );

    }

    JButton b2 = new JButton( "X" );
    b2.addActionListener( this );
    butPanel.add( b2 );

    JButton b3 = new JButton( "0" );
    b3.addActionListener( this );
    butPanel.add( b3 );

    JButton b4 = new JButton( "=" );
    b4.addActionListener( this );
    butPanel.add( b4 );

    JButton b5 = new JButton( "+" );
    b5.addActionListener( this );
```

```
        butPanel.add( b5 );

        JButton b6 = new JButton( "-" );
        b6.addActionListener( this );
        butPanel.add( b6 );

        JButton b7 = new JButton( "/" );
        b7.addActionListener( this );
        butPanel.add( b7 );

        // Create text area
        tf = new JTextField();
        myFrame.add( tf, BorderLayout.NORTH );

        // Make the frame visible
        myFrame.setVisible( true );

    }

}
```