simple calculator

```
import javax.swing.JFrame;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
class BuildCalculator extends JFrame implements ActionListener{
   JFrame actualWindow;
   JPanel resultPanel, buttonPanel, infoPanel;
   JTextField resultTxt;
   JButton btn_digits[] = new JButton[10];
   JButton btn_plus, btn_minus, btn_mul, btn_div, btn_equal, btn_dot, btn_clear;
   char eventFrom;
   JLabel expression, appTitle, siteTitle ;
   double oparand_1 = 0, operand_2 = 0;
   String operator = "=";
BuildCalculator() {
Font txtFont = new Font("TimesNewroman", Font.BOLD, 20);
Font titleFont = new Font("", Font.BOLD, 30);
Font expressionFont = new Font("", Font.BOLD, 15);
actualWindow = new JFrame("Calculator");
resultPanel = new JPanel();
buttonPanel = new JPanel();
infoPanel = new JPanel();
actualWindow.setLayout(new GridLayout(3, 1));
buttonPanel.setLayout(new GridLayout(4, 4));
infoPanel.setLayout(new GridLayout(3, 1));
actualWindow.setResizable(false);
appTitle = new JLabel("Basic Calculator");
appTitle.setFont(titleFont);
expression = new JLabel("Expression shown here");
expression.setFont(expressionFont);
siteTitle = new JLabel("SimpleCalculator");
siteTitle.setFont(expressionFont);
siteTitle.setHorizontalAlignment(SwingConstants.CENTER);
siteTitle.setForeground(Color.BLUE);
resultTxt = new JTextField(15);
resultTxt.setBorder(null);
resultTxt.setPreferredSize(new Dimension(15, 50));
resultTxt.setFont(txtFont);
resultTxt.setHorizontalAlignment(SwingConstants.RIGHT);
for(int i = 0; i < 10; i++) {
btn_digits[i] = new JButton(""+i);
btn_digits[i].addActionListener(this);
}
btn_plus = new JButton("+");
btn_plus.addActionListener(this);
btn_minus = new JButton("-");
btn_minus.addActionListener(this);
btn_mul = new JButton("*");
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btn_mul.addActionListener(this);
btn_div = new JButton("/");
btn_div.addActionListener(this);
btn_dot = new JButton(".");
btn_dot.addActionListener(this);
btn_equal = new JButton("=");
btn_equal.addActionListener(this);
btn_clear = new JButton("Clear");
btn_clear.addActionListener(this);
resultPanel.add(appTitle);
resultPanel.add(resultTxt);
resultPanel.add(expression);
for(int i = 0; i < 10; i++) {
        buttonPanel.add(btn_digits[i]);
}
buttonPanel.add(btn_plus);
buttonPanel.add(btn_minus);
buttonPanel.add(btn_mul);
buttonPanel.add(btn_div);
buttonPanel.add(btn_dot);
buttonPanel.add(btn_equal);
infoPanel.add(btn_clear);
infoPanel.add(siteTitle);
actualWindow.add(resultPanel);
actualWindow.add(buttonPanel);
actualWindow.add(infoPanel);
actualWindow.setSize(300, 500);
actualWindow.setVisible(true);
}
@Override
public void actionPerformed(ActionEvent e) {
eventFrom = e.getActionCommand().charAt(0);
String buildNumber;
if(Character.isDigit(eventFrom)) {
        buildNumber = resultTxt.getText() + eventFrom;
        resultTxt.setText(buildNumber);     }
 else if(e.getActionCommand() == ".") {
        buildNumber = resultTxt.getText() + eventFrom;
        resultTxt.setText(buildNumber);
}
else if(eventFrom != '='){
        oparand_1 = Double.parseDouble(resultTxt.getText());
        operator = e.getActionCommand();
        expression.setText(oparand_1 + " " + operator);
        resultTxt.setText("");
} else if(e.getActionCommand() == "Clear") {
        resultTxt.setText("");          }
else {
        operand_2 = Double.parseDouble(resultTxt.getText());
        expression.setText(expression.getText() + " " + operand_2);
switch(operator) {
```

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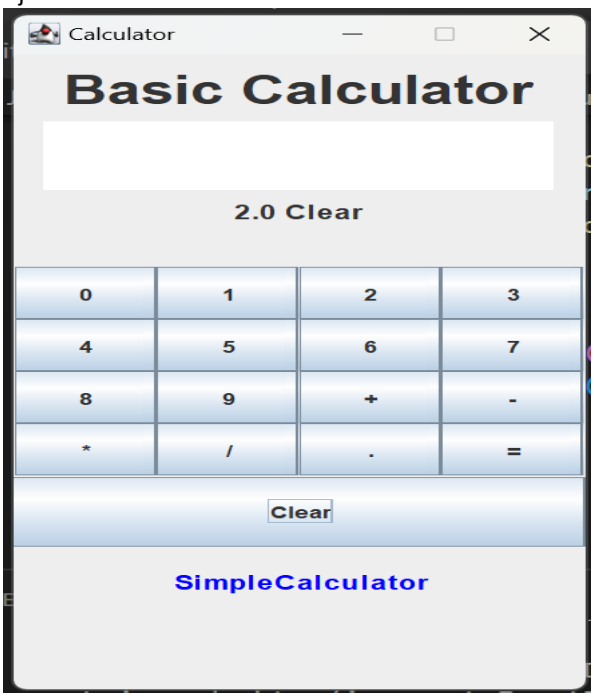
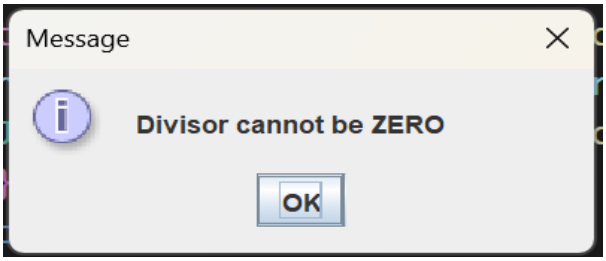
    case "+": resultTxt.setText(""+(oparand_1 + operand_2)); break;
    case "-": resultTxt.setText(""+(oparand_1 - operand_2)); break;
    case "*": resultTxt.setText(""+(oparand_1 * operand_2)); break;
    case "/": try {
                        if(operand_2 == 0)
                                throw new ArithmeticException();
                        resultTxt.setText(""+(oparand_1 / operand_2)); break;               }
                        catch(ArithmeticException ae) {
                                JOptionPane.showMessageDialog(actualWindow, "Divisor cannot
                           be ZERO");
                           }
                }
        }
    }
}
public class Calculator {
        public static void main(String[] args) {
                new BuildCalculator();
        }
 }
```





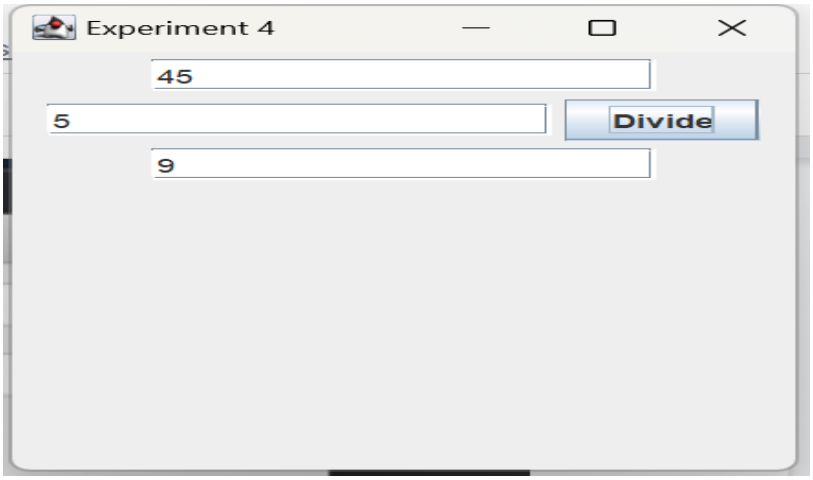
User interface to perform integer divisions

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
class BuildGUI extends JFrame implements ActionListener {
        JFrame actualWindow;
        JPanel container;
        JTextField txt_num1, txt_num2, txt_result;
        JButton btn_div;
        BuildGUI() {
                actualWindow = new JFrame("Experiment 4");
                container = new JPanel();
                container.setLayout(new FlowLayout());
                txt_num1 = new JTextField(20);
                txt_num2 = new JTextField(20);
                txt_result = new JTextField(20);
                btn_div = new JButton("Divide");
                btn_div.addActionListener(this);
                container.add(txt_num1);
                container.add(txt_num2);
                container.add(btn_div);
                container.add(txt_result);
                actualWindow.add(container);
                actualWindow.setSize(300, 300);
                actualWindow.setVisible(true);
                }
                @Override
                public void actionPerformed(ActionEvent e) {
                 int num1, num2;
                try {
                        num1 = Integer.parseInt(txt_num1.getText());
                        num2 = Integer.parseInt(txt_num2.getText());
```

```
                txt_result.setText(num1/num2+"");
            }
            catch(NumberFormatException nfe) {
                JOptionPane.showMessageDialog(actualWindow,"Please do
            enter only integers");

            }

          catch(ArithmeticException ae) {
JOptionPane.showMessageDialog(actualWindow,"Divisor can not be ZERO"); }
                }     }
            public class Week_4 {
                public static void main(String[] args) {
                        new BuildGUI();
                        } }
```



Simulation of traffic lights

```
import java.awt.Color;
import java.awt.*;
import java.awt.event.ItemEvent;
import java.awt.event.ItemListener;
import javax.swing.*;
class App extends JFrame implements ItemListener{
        JFrame actualWindow;
        JPanel messageContainer, lightsContainer;
        JLabel message;
        ButtonGroup btn_group;
        JRadioButton rb_red, rb_yellow, rb_green;
        App() {

            Font myFont = new Font("Verdana",Font.BOLD, 30);

            actualWindow = new JFrame("Traffic Lights");

           messageContainer = new JPanel();
          lightsContainer = new JPanel();

         message = new JLabel("Select Light");
btn_group = new ButtonGroup();
        rb_red = new JRadioButton("Red");

rb_yellow = new JRadioButton("Yellow");
rb_green = new JRadioButton("Green");

actualWindow.setLayout(new GridLayout(2, 1));

message.setFont(myFont);

rb_red.setForeground(Color.RED);

rb_yellow.setForeground(Color.YELLOW);
rb_green.setForeground(Color.GREEN);

btn_group.add(rb_red);

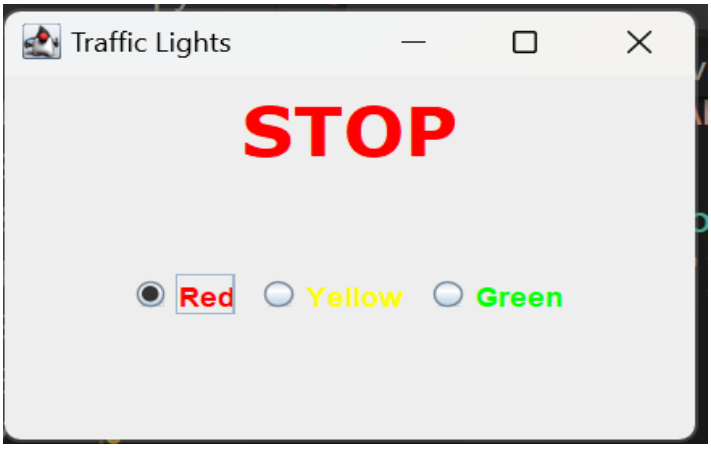
btn_group.add(rb_yellow);

btn_group.add(rb_green);

rb_red.addItemListener(this);
```

```
rb_yellow.addItemListener(this);
rb_green.addItemListener(this);
messageContainer.add(message);
lightsContainer.add(rb_red);
lightsContainer.add(rb_yellow);
lightsContainer.add(rb_green);
actualWindow.add(messageContainer);
actualWindow.add(lightsContainer);
actualWindow.setSize(300, 200);
actualWindow.setVisible(true);
}
@Override
public void itemStateChanged(ItemEvent ie) {
        JRadioButton selected = (JRadioButton) ie.getSource();
        String textOnButton = selected.getText();
        if(textOnButton.equals("Red")) {
                message.setForeground(Color.RED);
                message.setText("STOP");
        }
         else if(textOnButton.equals("Yellow")) {
                   message.setForeground(Color.YELLOW);
                  message.setText("READY");
        }
         else {
                message.setForeground(Color.GREEN);
                message.setText("GO");
        }
    }
}
public class Trafficlights {
        public static void main(String[] args) {
                        new App();
        }
}
```

Output:




Traffic Lights
READY
Red
Yellow
Green


Traffic Lights
GO
Red
Yellow
Green