Design Pattern Lab Manual

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Architectural Design Pattern

Sr. No	Name
1	Model Veiw Controller

Model-View-Controller

CalculatorController.java

```java
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
public class CalculatorController {
    private CalculatorView theView;
    private CalculatorModel theModel;
    public CalculatorController(CalculatorView theView,CalculatorModel
            theModel)
    {
        this.theView=theView;
        this.theModel=theModel;
        this.theView.addCAlculationListener(new Calculatelistener());
    }
    class Calculatelistener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            int fnum, snum = 0;
            try {
                fnum = theView.getFirstNumber();
                snum = theView.getSecondNumber();
                theModel.addTwoNumbers(fnum, snum);
                theView.setCalcSolution(theModel.getCalculationValue());
            } catch (NumberFormatException e1) {
                theView.displayErrorMessage("you need to enter 2
integers");
            }
        }
    }
}
```

CalculatorModel.java

```java
public class CalculatorModel {
    private int calcValue;
    public void addTwoNumbers(int fn,int sn) {
        calcValue=fn+sn;
    }
    public int getCalculationValue() {
        return calcValue;
    }
}
```

CalculatorView.java

```java
import java.awt.event.ActionListener;
import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JTextField;
import javax.swing.JLabel;

public class CalculatorView  extends JFrame {
    private JTextField fn=new JTextField(10);
    private JLabel addtionLabel=new JLabel("+");
    private JTextField sn=new JTextField(10);
    private JButton calculateButton=new JButton("Calculate");
    private JTextField calcSolution=new JTextField(10);
    CalculatorView(){
        JPanel calcPanel=new JPanel();
        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        this.setSize(600,200);
        calcPanel.add(fn);
        calcPanel.add(addtionLabel);
        calcPanel.add(sn);
        calcPanel.add(calculateButton);
        calcPanel.add(calcSolution);
        this.add(calcPanel);
    }
    public int getFirstNumber() {
        return Integer.parseInt(fn.getText());
    }
    public int getSecondNumber() {
        return Integer.parseInt(sn.getText());
    }
    public int getCalcSolution() {
        return Integer.parseInt(calcSolution.getText());
    }
    public void setCalcSolution(int solution) {
        calcSolution.setText(Integer.toString(solution));
    }
    void addCAlculationListener(ActionListener listenerforcalcButton) {
        calculateButton.addActionListener(listenerforcalcButton);
    }
    void displayErrorMessage(String errorMessage) {
        JOptionPane.showMessageDialog(this, errorMessage);
    }

}
```

MVCCalculator.java

```java
public class MVCCalculator {
    public static void main(String args[]) {
        CalculatorView theView=new CalculatorView();
        CalculatorModel theModel=new CalculatorModel();
        CalculatorController theController = new
                CalculatorController(theView,theModel);
        theView.setVisible(true);
    }
}
```

Output: