



2022

## Demonstration of MVC

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### Problem Statement:

A calculator application with user interface which can be used to perform basic arithmetic operations with two operands. This also stores all the calculations performed by the user and a particular problem can be fetched by the user on entering the appropriate problem number. This app also handles errors and displays appropriate messages to the user. This app was designed based on MVC.

### Model Component:

```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;

public class Model160 {

    private float calculationValue=0;
    private int ser_no=0;

    private View160 theView;
    String message="Invalid operator!";
    Model160(View160 theView)
    {
        this.theView=theView;
    }

    public void calculate(float firstNumber,char op, float secondNumber){
        if(op != '+' && op != '-' && op != '*' && op != '/')
            theView.displayErrorMessage(message);
        else
        {
            switch(op)
```

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```
{
    case '+':
        calculationValue = firstNumber + secondNumber;
        break;
    case '-':
        calculationValue = firstNumber - secondNumber;
        break;
    case '*':
        calculationValue = firstNumber * secondNumber;
        break;
    case '/':
        calculationValue = firstNumber / secondNumber;
        break;
    default:
        calculationValue = 0;
}

try{
    Class.forName("com.mysql.cj.jdbc.Driver");
    Connection con=DriverManager.getConnection(
        "jdbc:mysql://localhost:3306/MVC_PES1UG19CS160","root","Ganesh@456");
    Statement stmt=con.createStatement(ResultSet.TYPE_SCROLL_INSENSITIVE,
        ResultSet.CONCUR_READ_ONLY);
    ResultSet rs=stmt.executeQuery("select * from pes1ug19cs160");
    if(rs.last())
        ser_no=rs.getInt("sno")+1;
    else
        ser_no=1;
    stmt.executeUpdate("insert into pes1ug19cs160
values("+ser_no+", "+firstNumber+", '"+op+"', "+secondNumber+", "+calculationValue+");
");

    //System.out.println(ser_no);
    //System.out.println(rs.getInt("sno"));
    /*while(rs.next())
        System.out.println(rs.getInt(1)+" "+rs.getString(2)+"
```

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```
" + rs.getString(3)); */
        con.close();
    } catch (Exception e) { System.out.println(e);}
}

}

public float getCalculationValue(){

    return calculationValue;

}

public String retrieve(int pno) {

    String s="";

    try{
        Class.forName("com.mysql.cj.jdbc.Driver");
        Connection con=DriverManager.getConnection(
            "jdbc:mysql://localhost:3306/MVC_PES1UG19CS160","root","Ganesh@456");
        Statement stmt=con.createStatement(ResultSet.TYPE_SCROLL_INSENSITIVE,
            ResultSet.CONCUR_READ_ONLY);
        ResultSet rs=stmt.executeQuery("select * from pes1ug19cs160 where
sno="+pno);
        if(rs.last())
        {
            for(int i=2;i<=5;i++)
            {
                s=s+rs.getString(i);
                if(i==4)
                {
                    s=s+"=";
                }
            }
        }
    }
}
```

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```
    }  
    System.out.print(s);  
    }  
    else  
        s="Range exceeds";  
  
        //stmt.executeUpdate("insert into peslug19cs160  
values("+ser_no+", "+firstNumber+", '"+op+"', "+secondNumber+", "+calculationValue+");  
");  
  
        //System.out.println(ser_no);  
        //System.out.println(rs.getInt("sno"));  
        /*while(rs.next())  
        System.out.println(rs.getInt(1)+" "+rs.getString(2)+"  
"+rs.getString(3)); */  
        con.close();  
        }catch(Exception e){ System.out.println(e);}  
  
    return s;  
  
    }  
  
}
```

**View Component:**

```
import java.awt.event.ActionListener;

import javax.swing.*;

public class View160 extends JFrame{

    private JTextField firstNumber = new JTextField(5);
    private JTextField operator = new JTextField(1);
    private JTextField secondNumber = new JTextField(5);
    private JButton calculateButton = new JButton("Ans=");
    private JTextField calcSolution = new JTextField(5);
    private JLabel number=new JLabel("Enter the problem number to be viewed:");
    private JTextField no = new JTextField(3);
    private JButton view = new JButton("View");
    private JLabel lab=new JLabel("Ganesh Tarun S R\n PES1UG19CS160 \n MVC
Assignment");
    private JTextField query = new JTextField(10);

    View160(){

        JPanel calcPanel = new JPanel(); //container class

        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        this.setSize(500,500);

        calcPanel.add(firstNumber);
        calcPanel.add(operator);
        calcPanel.add(secondNumber);
        calcPanel.add(calculateButton);
        calcPanel.add(calcSolution);
```

```
        calcPanel.add(number);
        calcPanel.add(no);
        calcPanel.add(view);
        calcPanel.add(query);
        calcPanel.add(lab);

        this.add(calcPanel);

    }

    public float getFirstNumber(){

        return Float.parseFloat(firstNumber.getText());

    }

    public float getSecondNumber(){

        return Float.parseFloat(secondNumber.getText());

    }

    public int getQueryNumber(){

        return Integer.parseInt(no.getText());

    }

    public char getOperator()
    {
        return operator.getText().charAt(0);
    }

    public float getCalcSolution(){
```

```
        return Float.parseFloat(calcSolution.getText());
    }

    public void setCalcSolution(float solution){

        calcSolution.setText(Float.toString(solution));

    }

    void addCalculateListener(ActionListener listenForCalcButton){

        calculateButton.addActionListener(listenForCalcButton); //event is
performed when button is clicked

    }

    void addRetriveListener(ActionListener listenForRetButton){ //attaching event
to the calculate button

        view.addActionListener(listenForRetButton);

    }

    public void setQuery(String res){

        query.setText(res);

    }

    void displayErrorMessage(String errorMessage){

        JOptionPane.showMessageDialog(this, errorMessage);
```

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```
}  
  
}
```

### Controller Component:

```
import java.awt.event.ActionEvent;  
import java.awt.event.ActionListener;  
public class Controller160 {  
  
    private View160 theView;  
    private Model160 theModel;  
  
    public Controller160(View160 theView, Model160 theModel) {  
        this.theView = theView;  
        this.theModel = theModel;  
        this.theView.addCalculateListener(new CalculateListener()); //call  
addCalculateListener with CalculateListner obj as parameter  
        this.theView.addRetriveListener(new RetriveListener());  
    }  
  
    class CalculateListener implements ActionListener{  
  
        public void actionPerformed(ActionEvent e) {  
  
            float firstNumber, secondNumber = 0;  
            char op='+';  
            try{  
  
                firstNumber = theView.getFirstNumber();  
                secondNumber = theView.getSecondNumber();  
                op=theView.getOperator();  
  
                theModel.calculate(firstNumber,op, secondNumber);  
            }  
        }  
    }  
}
```



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```
        theView.setCalcSolution(theModel.getCalculationValue());  
    }  
  
    catch(NumberFormatException ex){  
  
        System.out.println(ex);  
  
        theView.displayErrorMessage("You Need to Enter 2 Integers");  
  
    }  
  
}  
  
class RetriveListener implements ActionListener{  
    public void actionPerformed(ActionEvent e) {  
  
        int problem;  
        try{  
  
            problem = theView.getQueryNumber();  
  
            //theModel.retrive(pno);  
  
            theView.setQuery(theModel.retrive(problem));  
  
        }  
  
        catch(NumberFormatException ex){  
  
            System.out.println(ex);  
  
            theView.displayErrorMessage("Enter query number properly");  
        }  
    }  
}
```

## Demonstration of MVC

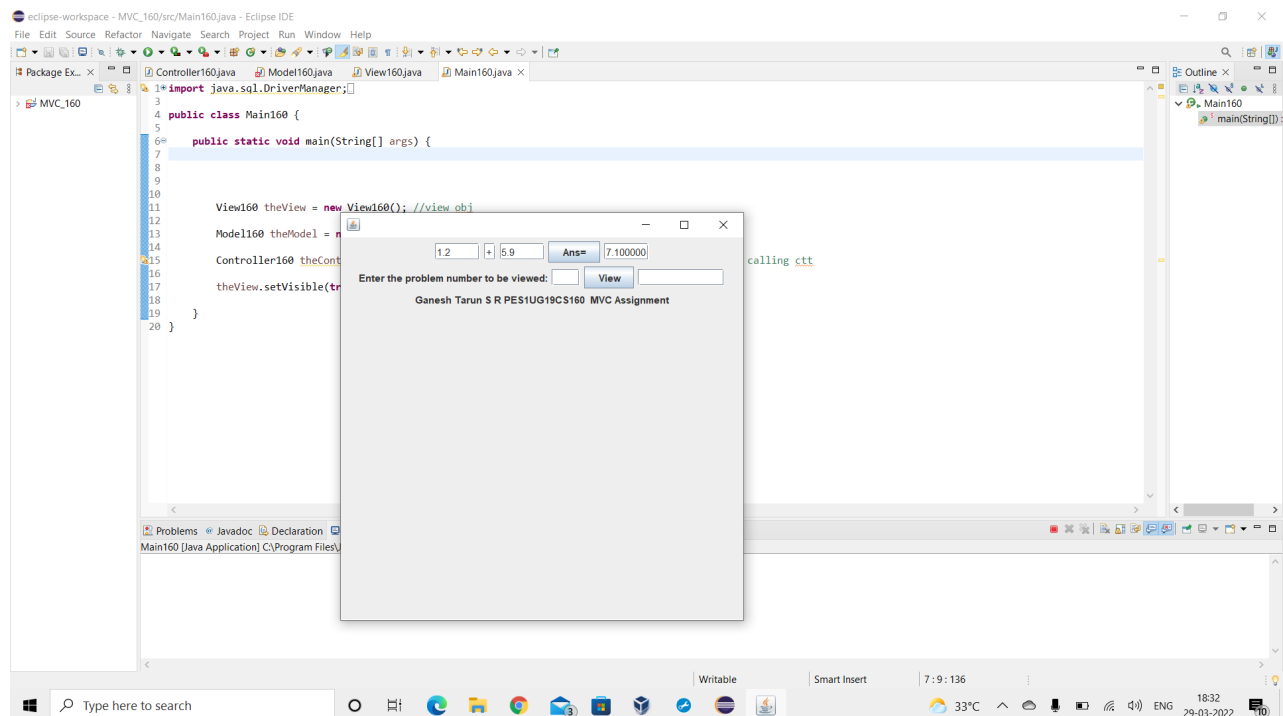
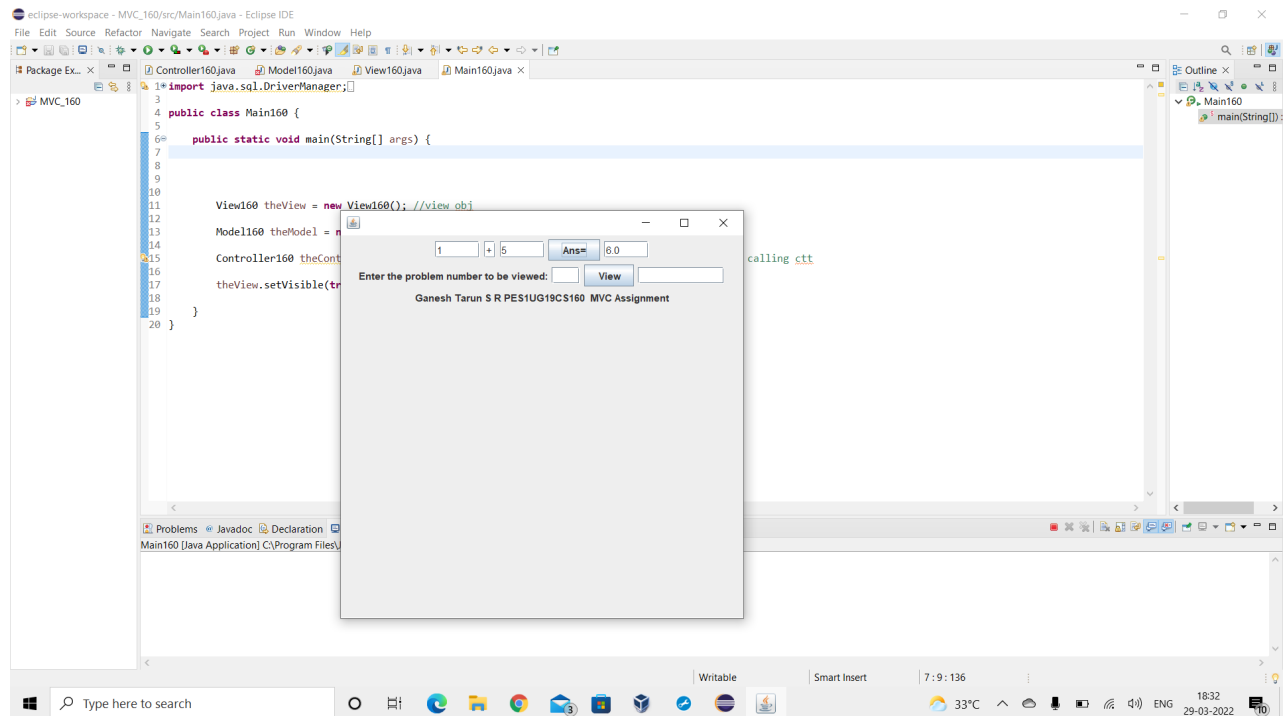
```
    }  
}  
}
```

### Main Class:

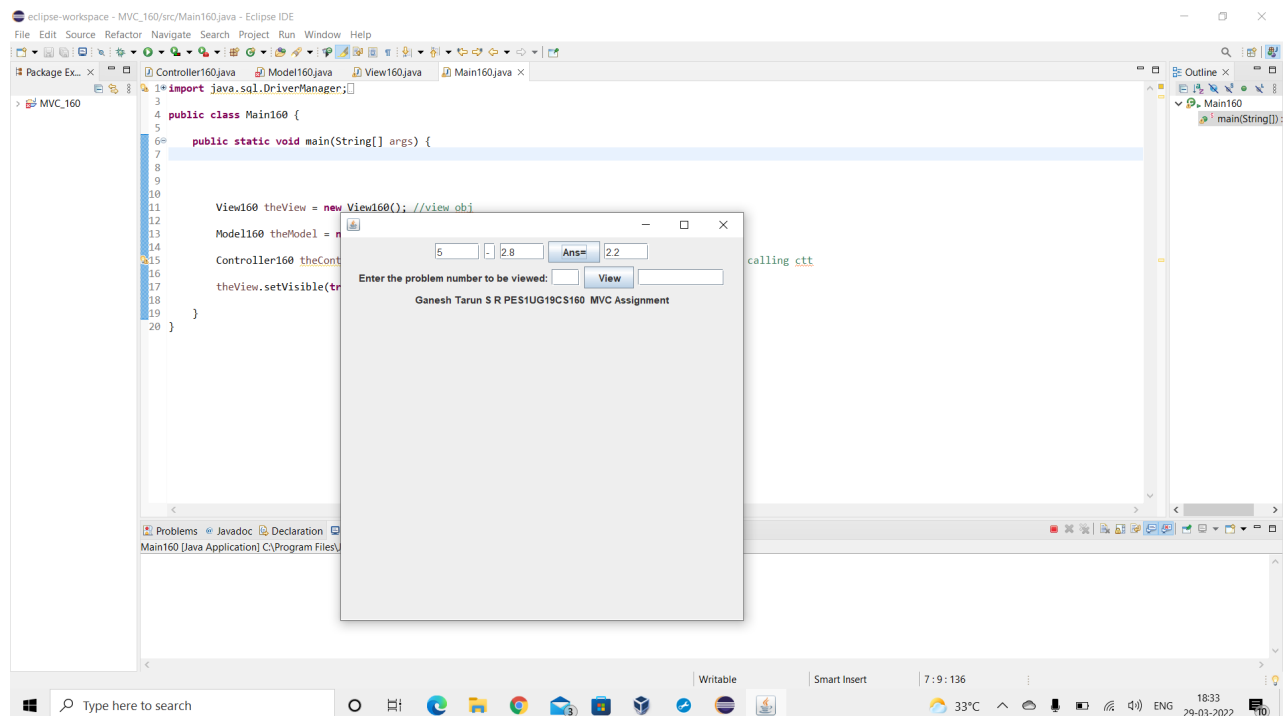
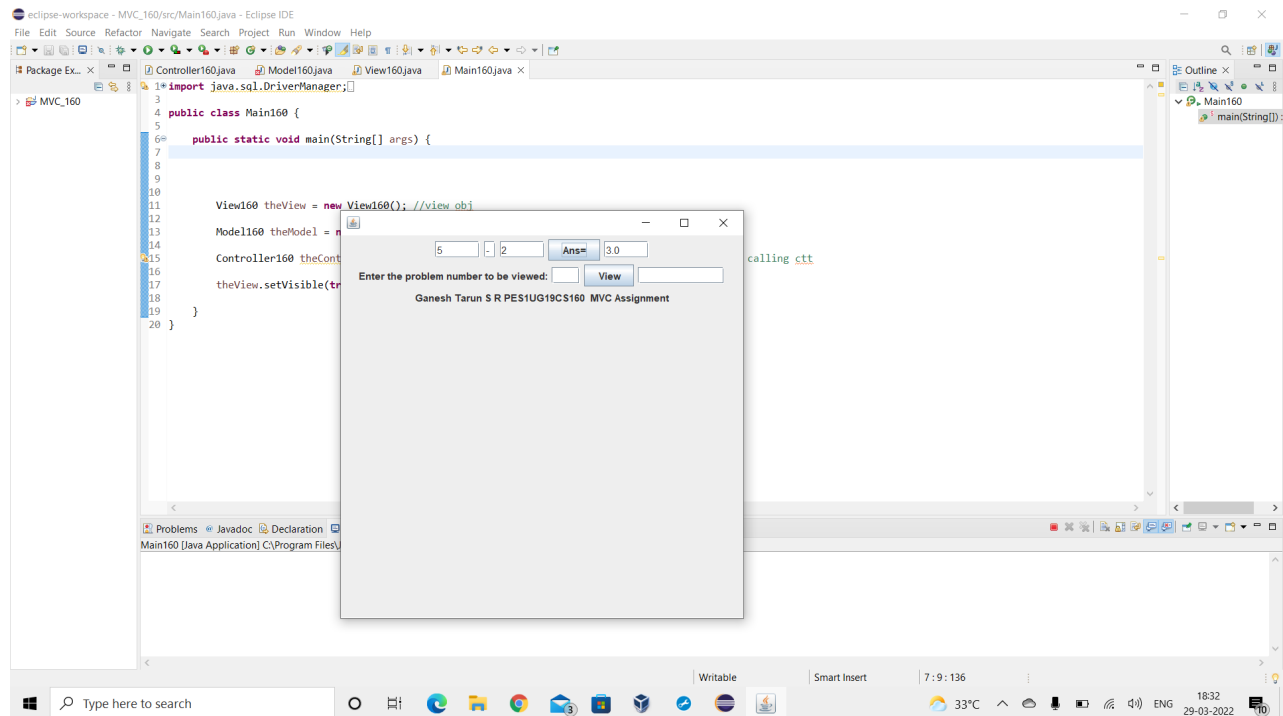
```
import java.sql.DriverManager;  
import java.sql.*;  
  
public class Main160 {  
  
    public static void main(String[] args) {  
  
        View160 theView = new View160(); //view obj  
  
        Model160 theModel = new Model160(theView); //model obj  
  
        Controller160 theController = new Controller160(theView,theModel); //  
controller obj and calling ctt  
  
        theView.setVisible(true);  
  
    }  
}
```

### Output Screen Shots:

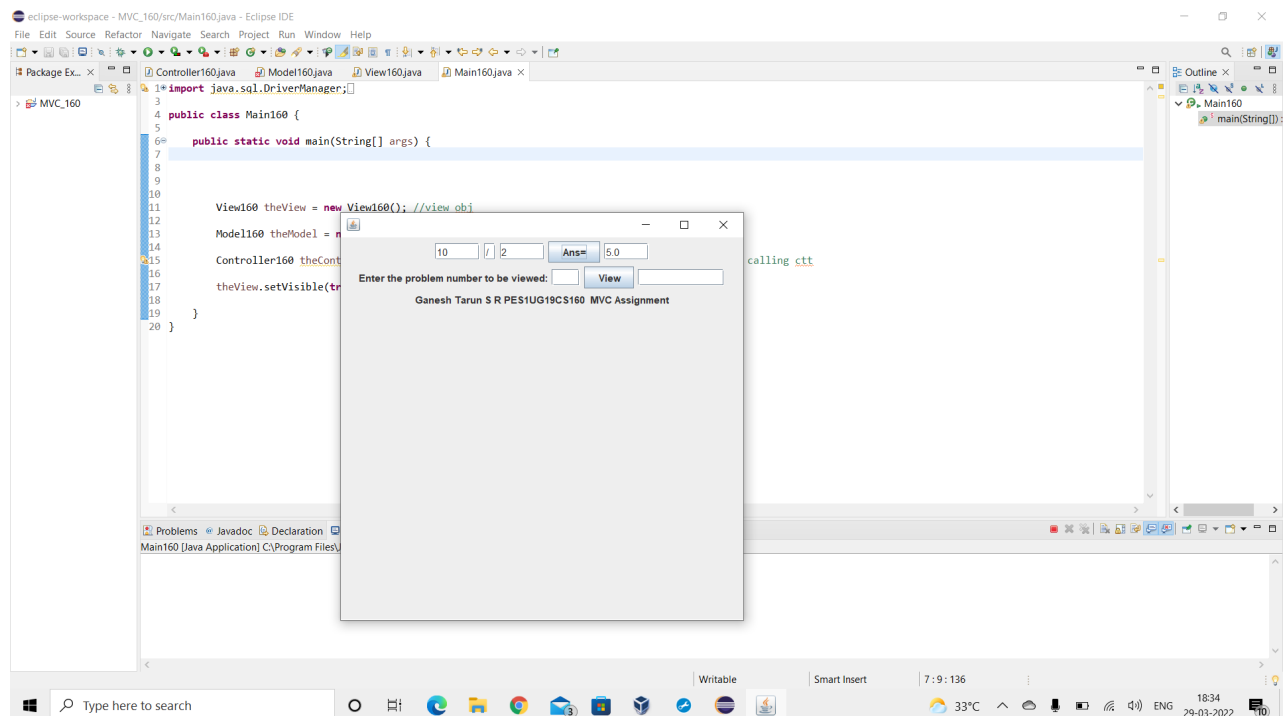
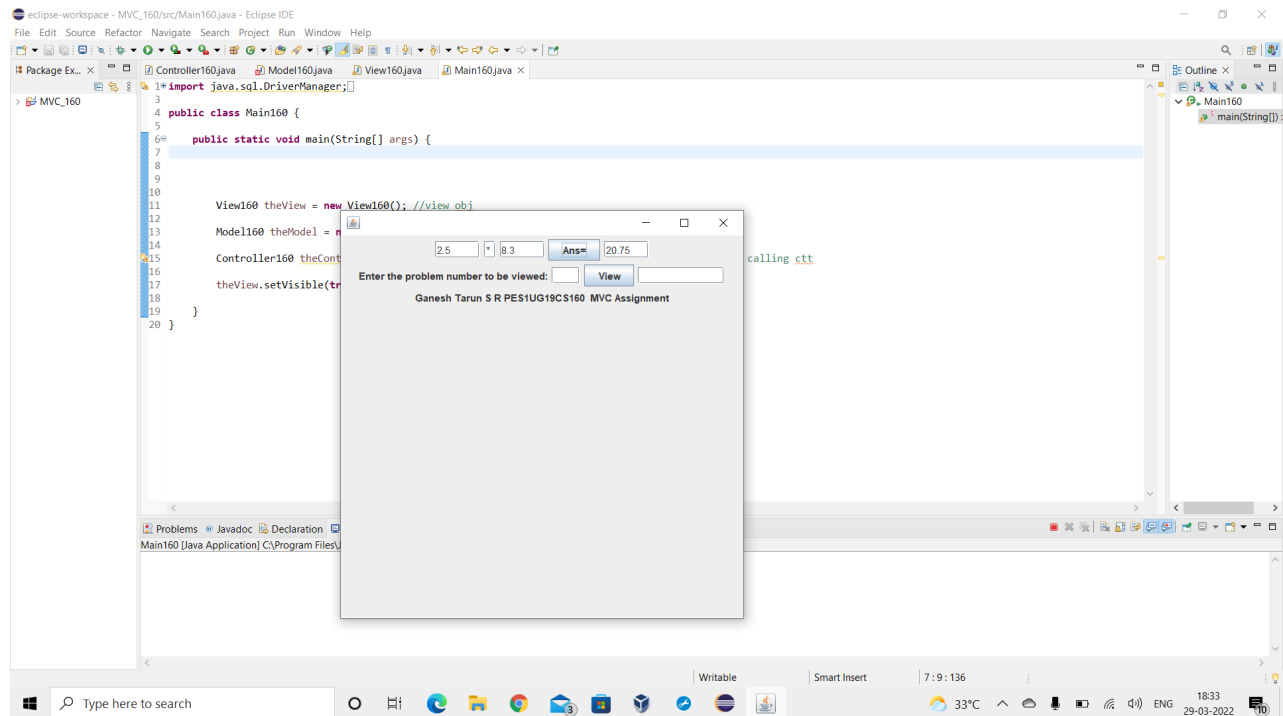
# Demonstration of MVC



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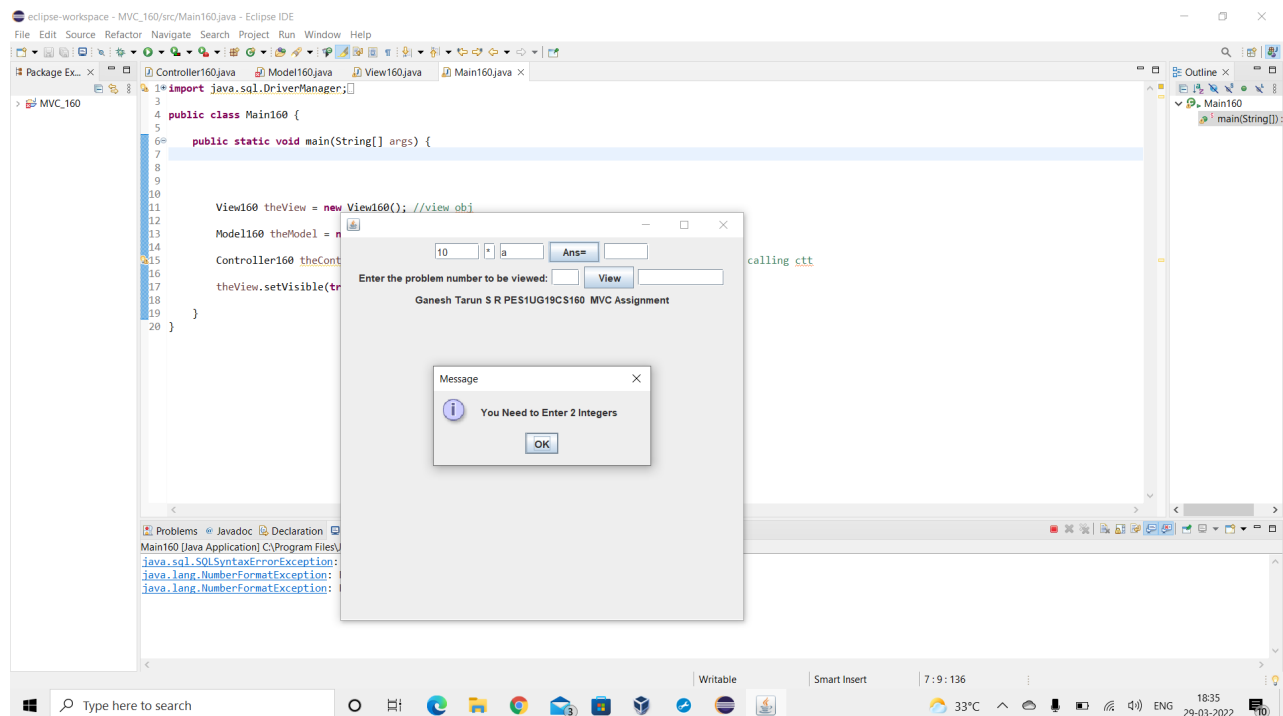
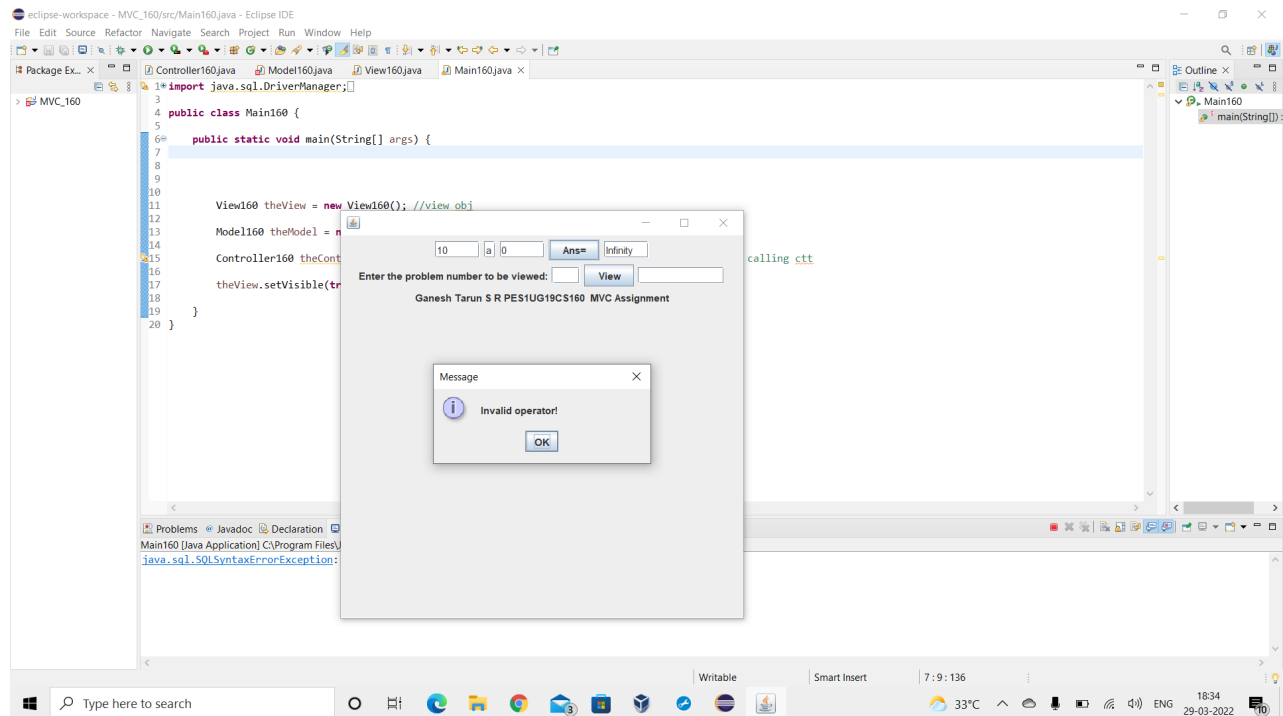


# Demonstration of MVC

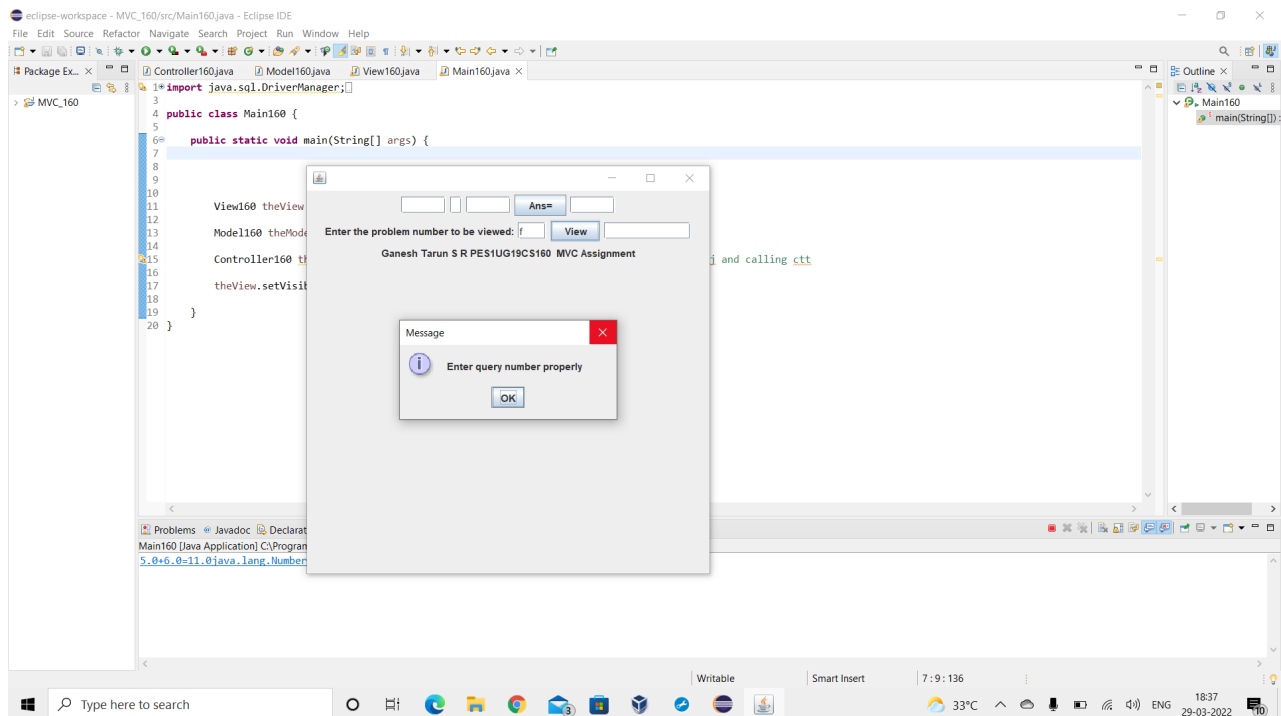
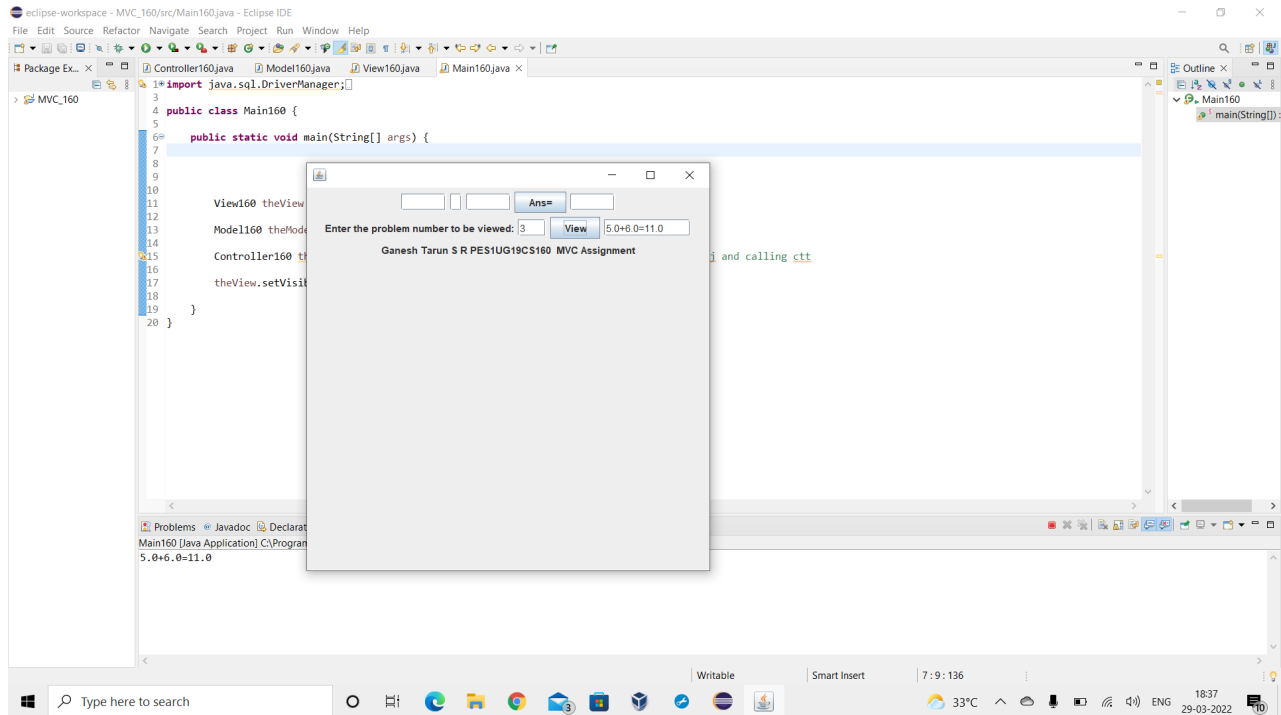




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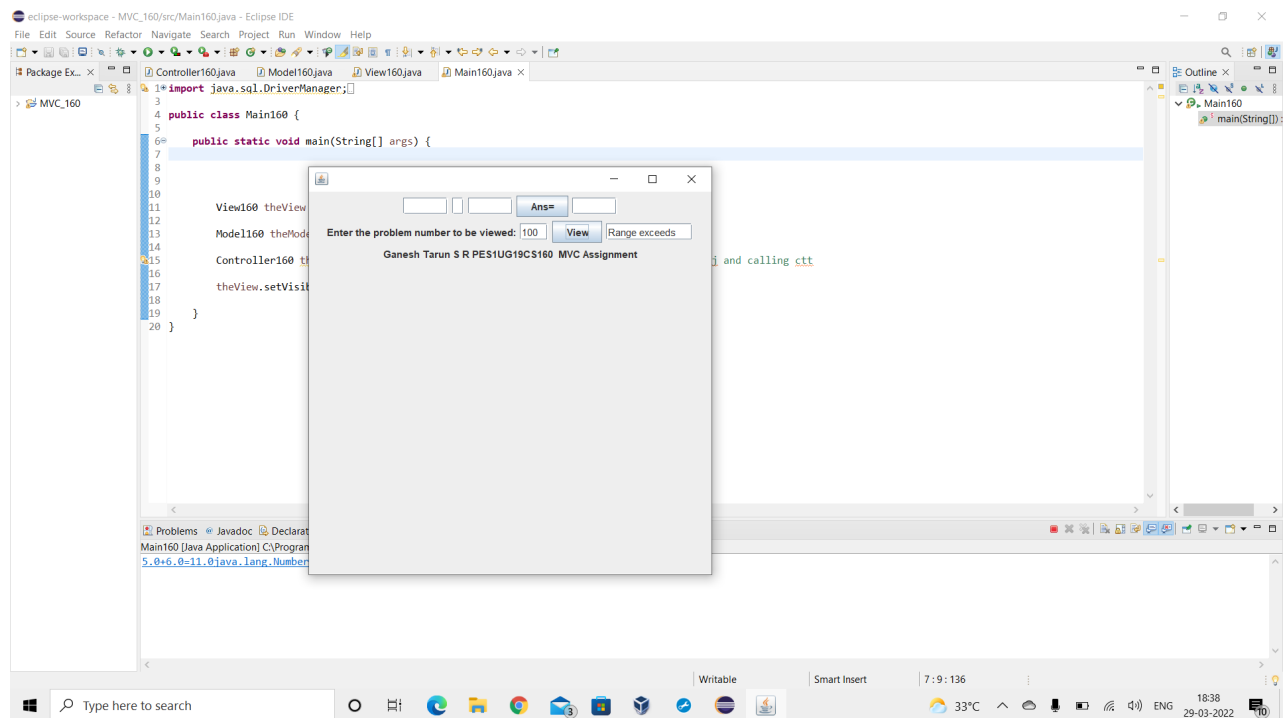


# Demonstration of MVC





## Demonstration of MVC



### Database:

MySQL is used in this project. Database is used to store all the problems and desired problems can be retrieved by the user from it. JDBC is used for connectivity of application with database.

**Demonstration of MVC****Technologies /Tools used:**

JAVA	for application
MySQL	for database
SWING	for GUI
JDBC	for connectivity
Eclipse	IDE