**PROJECT – 3**

**PROJECT NAME : SIMPLE CALCULATOR**

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**PROJECT SUMMARY :**

**The aim is to create a java program to develop a simple calculator in java with the help of AWT/SWING with event handling.the caluculator will perform all the mathematical operations .JFrame is a top-level container that provides the frame for our calculator application.The caluculator can be implemted in the following steps:**

**> To create a JFrame, we'll extend the Calculator class from the JFrame class.**

**>To create the calculator's interface, we'll need several elements, including buttons for each operation, a display area for input and output, and panels to organize the components. We define these elements as instance variables in the Calculator class.**

**>Constructor: The constructor initializes the calculator UI, sets up the layout managers, and adds buttons and other UI elements to the frame. It also sets up the action listeners for the buttons.**

**>actionPerformed(): This method handles button actions and user input by calling appropriate helper functions or updating the display.**

**INPUT :**

**package sourcecode;**

**import javax.swing.\*;**

**import java.awt.\*;**

**import java.awt.event.\*;**

**public class CALCI implements ActionListener{**

**JFrame frame;**

**JTextField textfield;**

**JButton[] numberButtons = new JButton[10];**

**JButton[] functionButtons = new JButton[9];**

**JButton addButton,subButton,mulButton,divButton;**

**JButton decButton, equButton, delButton, clrButton, negButton;**

**JPanel panel;**

**Font myFont = new Font("Calbiri",Font.BOLD,50);**

**double num1=0,num2=0,result=0;**

**char operator;**

**CALCI(){**

**frame = new JFrame("Calculator");**

**frame.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);**

**frame.setSize(420, 550);**

**frame.setLayout(null);**

**textfield = new JTextField();**

**textfield.setBounds(50, 25, 300, 50);**

**textfield.setFont(myFont);**

**textfield.setEditable(false);**

**addButton = new JButton("+");**

**subButton = new JButton("-");**

**mulButton = new JButton("\*");**

**divButton = new JButton("/");**

**decButton = new JButton(".");**

**equButton = new JButton("=");**

**delButton = new JButton("Del");**

**clrButton = new JButton("Clr");**

**negButton = new JButton("(-)");**

**functionButtons[0] = addButton;**

**functionButtons[1] = subButton;**

**functionButtons[2] = mulButton;**

**functionButtons[3] = divButton;**

**functionButtons[4] = decButton;**

**functionButtons[5] = equButton;**

**functionButtons[6] = delButton;**

**functionButtons[7] = clrButton;**

**functionButtons[8] = negButton;**

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

**functionButtons[i].addActionListener(this);**

**functionButtons[i].setFont(myFont);**

**functionButtons[i].setFocusable(false);**

**}**

**for(int i =0;i<10;i++) {**

**numberButtons[i] = new JButton(String.valueOf(i));**

**numberButtons[i].addActionListener(this);**

**numberButtons[i].setFont(myFont);**

**numberButtons[i].setFocusable(false);**

**}**

**negButton.setBounds(50,430,100,50);**

**delButton.setBounds(150,430,100,50);**

**clrButton.setBounds(250,430,100,50);**

**panel = new JPanel();**

**panel.setBounds(50, 100, 300, 300);**

**panel.setLayout(new GridLayout(4,4,10,10));**

**panel.add(numberButtons[1]);**

**panel.add(numberButtons[2]);**

**panel.add(numberButtons[3]);**

**panel.add(addButton);**

**panel.add(numberButtons[4]);**

**panel.add(numberButtons[5]);**

**panel.add(numberButtons[6]);**

**panel.add(subButton);**

**panel.add(numberButtons[7]);**

**panel.add(numberButtons[8]);**

**panel.add(numberButtons[9]);**

**panel.add(mulButton);**

**panel.add(decButton);**

**panel.add(numberButtons[0]);**

**panel.add(equButton);**

**panel.add(divButton);**

**frame.add(panel);**

**frame.add(negButton);**

**frame.add(delButton);**

**frame.add(clrButton);**

**frame.add(textfield);**

**frame.setVisible(true);**

**}**

**public static void main(String[] args) {**

**CALCI calc = new CALCI();**

**}**

**@Override**

**public void actionPerformed(ActionEvent e) {**

**for(int i=0;i<10;i++) {**

**if(e.getSource() == numberButtons[i]) {**

**textfield.setText(textfield.getText().concat(String.valueOf(i)));**

**}**

**}**

**if(e.getSource()==decButton) {**

**textfield.setText(textfield.getText().concat("."));**

**}**

**if(e.getSource()==addButton) {**

**num1 = Double.parseDouble(textfield.getText());**

**operator ='+';**

**textfield.setText("");**

**}**

**if(e.getSource()==subButton) {**

**num1 = Double.parseDouble(textfield.getText());**

**operator ='-';**

**textfield.setText("");**

**}**

**if(e.getSource()==mulButton) {**

**num1 = Double.parseDouble(textfield.getText());**

**operator ='\*';**

**textfield.setText("");**

**}**

**if(e.getSource()==divButton) {**

**num1 = Double.parseDouble(textfield.getText());**

**operator ='/';**

**textfield.setText("");**

**}**

**if(e.getSource()==equButton) {**

**num2=Double.parseDouble(textfield.getText());**

**switch(operator) {**

**case'+':**

**result=num1+num2;**

**break;**

**case'-':**

**result=num1-num2;**

**break;**

**case'\*':**

**result=num1\*num2;**

**break;**

**case'/':**

**result=num1/num2;**

**break;**

**}**

**textfield.setText(String.valueOf(result));**

**num1=result;**

**}**

**if(e.getSource()==clrButton) {**

**textfield.setText("");**

**}**

**if(e.getSource()==delButton) {**

**String string = textfield.getText();**

**textfield.setText("");**

**for(int i=0;i<string.length()-1;i++) {**

**textfield.setText(textfield.getText()+string.charAt(i));**

**}**

**}**

**if(e.getSource()==negButton) {**

**double temp = Double.parseDouble(textfield.getText());**

**temp\*=-1;**

**textfield.setText(String.valueOf(temp));**

**}**

**}**

**}**

**OUTPUT :**

**For example:**

**The examples of the following Mathematical operations which are performed in simple calculator are:**

**Addition:**

**Input: 7 + 8**

**Output: 15.0**

**Subtraction:**

**Input: 9 - 4**

**Output: 5.0**

**Multiplication:**

**Input: 5 \* 6**

**Output: 30.0**

**Division:**

**Input: 12 / 3**

**Output: 4.0**

**Square Root:**

**Input: √(16)**

**Output: 4.0**

**Positive/Negative Number:**

**Input: -(-7)**

**Output: 7.0**

