A Report on Open Ended Problem titled

CALCULATOR (with GUI)

Submitted for partial fulfillment of III semester

OBJECT ORIENTED PROGRAMING IN JAVA LABORATORY

Department of Artificial Intelligence & Data Science

Siddaganga Institute of Technology, Tumakuru-3

(An autonomous institution affiliated to VTU, Belagavi, Approved by AICTE, New Delhi, Accredited by NAAC with 'A' grade & ISO 9001:2015 Certified)

Team Members :-

1.Abhishek S (1SI20AD001)

2.Chethan Managavi (1SI20AD006)

3.Maruthi R (1SI20AD009)

Submitted To :

H Ranjini

(Assistant Professor ,Dept. of AI and DS**)**

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ABSTRACT

Calculator is a simple applet based java program which allows user to perform basic arithmetic operations. It contains buttons representing numbers (0-9) and basic arithmetic operators (+,-,*,/) which are present on a small applet window all arranged properly where user can press the buttons and operator, which get displayed on the text field.

- Text field display the arithmetic expressions and the calculated result, and it periodically repaint the input field .
- A button called to CE provided to clear the input filed.
- It also has the ability to perform multiple operation where in it calculate the result of previous operation and takes it as an operand for next operation .
- We took help of following Data Structures to complete the project Strings ,array of objects ,array of intigers.

Source Code

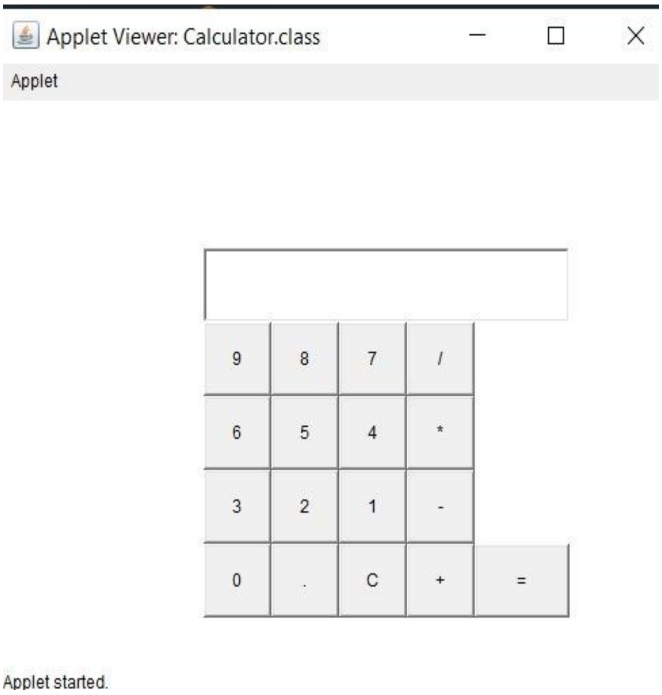
```
/*Java Program to Demonstrate a Basic Calculator using Applet*/

import java.awt.*;

import java.applet.*;

import java.awt.event.*;

public class Calculator extends Applet implements ActionListener

{

    TextField input;

    //Function to add features to the frame

    public void init()

    {

    setBackground(Color.white);

    setLayout(null);

    int i;

    input = new TextField();

    input.setBounds(150,100,270,50);

    this.add(input);

    Button button[] = new Button[10];

    for(i=0;i<10;i++)

    {

        button[i] = new Button(String.valueOf(9-i));

        button[i].setBounds(150+((i%3)*50),150+((i/3)*50),50,50);

        this.add(button[i]);

        button[i].addActionListener(this);

    }

    Button dec=new Button(".");
    dec.setBounds(200,300,50,50);

    this.add(dec);

    dec.addActionListener(this);


    Button clr=new Button("C");

    clr.setBounds(250,300,50,50);

    this.add(clr);

    clr.addActionListener(this);


    Button operator_btn[] = new Button[5];

    operator_btn[0]=new Button("/");

    operator_btn[1]=new Button("*");

    operator_btn[2]=new Button("-");

    operator_btn[3]=new Button("+");

    operator_btn[4]=new Button("=");

    for(i=0;i<4;i++)

    {

        operator_btn[i].setBounds(300,150+(i*50),50,50);

        this.add(operator_btn[i]);

        operator_btn[i].addActionListener(this);

    }

    operator_btn[4].setBounds(350,300,70,50);

    this.add(operator_btn[4]);

    operator_btn[4].addActionListener(this);

    }

    String number1="";

    String op="";
    String number2="";
    //Function to calculate the expression
    public void actionPerformed(ActionEvent e)
    {
    String button = e.getActionCommand();
        char ch = button.charAt(0);
    if(ch>='0' && ch<='9'|| ch=='.')
    {
        if (!op.equals(""))
        number2 = number2 + button;
        else
        number1 = number1 + button;
        input.setText(number1+op+number2);
    }
    else if(ch=='C')
    {
        number1 = op = number2 = "";
        input.setText("");
    }
    else if (ch =='=')
    {
        if(!number1.equals("") && !number2.equals(""))
        {
        double temp;
        double n1=Double.parseDouble(number1);
        double n2=Double.parseDouble(number2);
        if(n2==0 && op.equals("/"))
```

```
        {
            input.setText(number1+op+number2+" = Zero Division Error");
            number1 = op = number2 = "";
        }
        else
        {
            if (op.equals("+"))
                temp = n1 + n2;
            else if (op.equals("-"))
                temp = n1 - n2;
            else if (op.equals("/"))
                temp = n1/n2;
            else
                temp = n1*n2;
            input.setText(number1+op+number2+" = "+temp);
            number1 = Double.toString(temp);
            op = number2 = "";
            }
            }
        else
        {
        number1 = op = number2 = "";
        input.setText("");
        }
        }
    else
    {
```

```
if (op.equals("") || number2.equals(""))
op = button;
else
{
double temp;
double n1=Double.parseDouble(number1);
double n2=Double.parseDouble(number2);
if(n2==0 && op.equals("/"))
{
   input.setText(number1+op+number2+" = Zero Division Error");
   number1 = op = number2 = "";
}
else
{
   if (op.equals("+"))
      temp = n1 + n2;
   else if (op.equals("-"))
      temp = n1 - n2;
   else if (op.equals("/"))
      temp = n1/n2;
   else
      temp = n1*n2;
   number1 = Double.toString(temp);
   op = button;
   number2 = "";
   }
   }
```

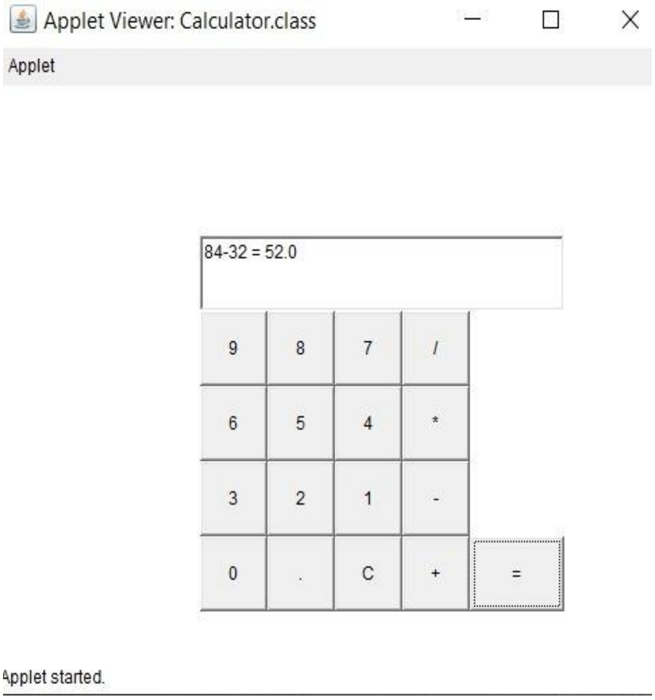
```
        input.setText(number1+op+number2);

        }

    }

}

/*

<applet code = Calculator.class width=600 height=600>

</applet>

*/
```

Output And Implementation



Applet Viewer: Calculator.class

Applet started.



Applet Viewer: Calculator.class

```
84-32 = 52.0
```

Applet started.

	Methods used	**Description**
1)	**setBackground(*Color* *c*)**	**Sets the background color of this component**
2)	**TextField()**	**Creates a TextField with empty text content.**
3)	**setBounds(*TextBoundsType* *value*)**	**Is used to set the dimension of the button like height,width,padding**
4)	**add(*Component comp*)**	**Appends the specified component to the end of this container.**
5)	**actionPerformed(*ActionEvent* *e*)**	**Invoked when an action occurs.**
6)	**getActionCommand ()**	**Returns the command string associated with this action.**
7)	**setText(*String value*)**	**Sets the value of the property text.**
8)	**Double.parseDouble(*str*);**	**Returns a new double initialized to the value represented by the specified string**
9)	**setLayout(*LayoutManager* *mgr*)**	**Sets the layout manager for this container.**

Conclusion

- ❖ By completion of this project we learnt implementation of **applets** in much deeper way.
- ❖ We learned to write efficient code and problems that arise in arranging GUI components.
- ❖ We explored so many applets function which are responsible to create beautiful GUI components.
- ❖ Working in Team provided an opportunity to learn collaborative coding and Version control system for code sharing

Bibliography

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> https://www.javatpoint.com/java-awt-textfield