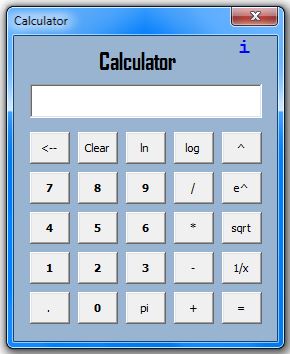
PROJECT

**ON**

**Calculator**



**SUBMITTED BY:** CHANDRA MOHAN PANDEY

TRADE: COPA (COMPUTER OPERATOR & PROGRAMMING ASSISTANT)

**SUBMITTED TO:** MR. NIRMAL PRATAP SINGH

INSTRUCTOR

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**PREFACE**

This project consists a computer program of **Calculator** which is very useful in real life situation for providing instant calculation result.

It can be used to :-

* Provide operations for the user to select one at a time.
* Perform any process that consists of a sequence of steps each of which applies one of these operations.
* Have no purpose other than these processes, because the operations are the sole, or at least the primary, features of the calculator, rather than being secondary features that support other functionality that is not normally known simply as calculation.

This program is written in **Excel- VBA (Visual Basic for Application)** which is an event-driven programming language from Microsoft that is now predominantly used with Microsoft office applications such as MS Excel, MS Word, and MS Access. It helps techies to build customized applications and solutions to enhance the capabilities of those applications. The advantage of this facility is that we NEED NOT to have visual basic installed on our PC, however, installing Office will implicitly help in achieving the purpose.

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Calculator using Excel VBA UserForm

Calculator using Excel VBA UserForm. Following is the step by step detailed explanation to automate this project using VBA.

* Key Steps
* Properties & values of controls
* Modules
* Source code
* Instructions to execute calculator

## Key Steps:

Key steps to develop this caculator project. We are going to write multiple procedures for multiple controls with the below approach.

* Step 01: **Create UserForm**: Create a userform from the Insert menu in VBA Editor.
* Step 02: **Place toolbox controls**: Place controls on the userform.
* Step 03: **Set properties and alignment of all controls**
* Step 04: **Back Button**: It is used to go back one digit.
* Step 05: **Clear Button**: It is used to clear the display area (textbox).
* Step 06: **Natural Log (ln) Button**: It is used for logarithm to the base e.
* Step 07: **Common** **Log (log) Button**: It is used for logarithm to the base 10.
* Step 08: **Exponent (^) Button**: It is used for exponentiation.
* Step 09: **e Exponent (e^) Button**: It is used for exponentiation of e (2.71828).
* Step 10: **Square Root (sqrt) Button**: It is used for square root..
* Step 11: **Reciprocal (1/x) Button**: It is used for reciprocal .
* Step 12: **Divide (/) Button**: It is used for division.
* Step 13: **Multiply (\*) Button**: It is used for multiplication.
* Step 14: **Subtract (-) Button**: It is used for subtraction.
* Step 15: **Add (+) Button**: It is used for addition.
* Step 16: **Dot (.) Button**: It is used to display decimal.
* Step 17: **One (1) Button**: It is used to display number 1.
* Step 18: **Two (2) Button**: It is used to display number 2.
* Step 19: **Three (3) Button**: It is used to display number 3.
* Step 20: **Four (4) Button**: It is used to display number 4.
* Step 21: **Five (5) Button**: It is used to display number 5.
* Step 22: **six (6) Button**: It is used to display number 6.
* Step 23: **Seven (7) Button**: It is used to display number 7.
* Step 24: **Eight (8) Button**: It is used to display number 8.
* Step 25: **Nine (9) Button**: It is used to display number 9.
* Step 26: **Zero (0) Button**: It is used to display number 0.
* Step 27: **Pi (pi) Button**: It is used to display value of pi (3.14159265).
* Step 28: **Equal To (=) Button**: It is used to perform calculations.
* Step 29: **Textbox**: It is used to display result.
* Step 30: **About Label (i)**: It is used to display version.

## Properties & values of controls

Now, lets set control properties and their values on the userform:

| **Control** | **Property** | **Value** |
| --- | --- | --- |
| UserForm | Name | UserForm1 |
|  | BackColor | &H80000002& |
|  | Caption | Calculator |
| Label | Name | Label1 |
|  | BackColor | &H80000002& |
|  | ForeColor | &H00000000& |
|  | Caption | Calculator |
| Label | Name | Label2 |
|  | BackColor | &H80000002& |
|  | ForeColor | &H00FF0000& |
|  | Caption | i |
| TextBox | Name | TextBox1 |
|  | ForeColor | &H80000008& |
|  | SpecialEffect | 2- fmSpecialEffectSunken |
|  | TextAlign | 3-frmTextAlignRight |
| CommandButton | Name | CommandButton34 |
|  | Caption | <-- |
| CommandButton | Name | CommandButton12 |
|  | Caption | Clear |
| CommandButton | Name | CommandButton9 |
|  | Caption | ln |
| CommandButton | Name | CommandButton32 |
|  | Caption | log |
| CommandButton | Name | CommandButton31 |
|  | Caption | ^ |
| CommandButton | Name | CommandButton30 |
|  | Caption | e^ |
| CommandButton | Name | CommandButton8 |
|  | Caption | sqrt |
| CommandButton | Name | CommandButton29 |
|  | Caption | 1/x |
| CommandButton | Name | CommandButton27 |
|  | Caption | / |
| CommandButton | Name | CommandButton26 |
|  | Caption | \* |
| CommandButton | Name | CommandButton25 |
|  | Caption | – |
| CommandButton | Name | CommandButton24 |
|  | Caption | + |
| CommandButton | Name | CommandButton23 |
|  | Caption | . |
| CommandButton | Name | CommandButton20 |
|  | Caption | 1 |
| CommandButton | Name | CommandButton17 |
|  | Caption | 2 |
| CommandButton | Name | CommandButton21 |
|  | Caption | 3 |
| CommandButton | Name | CommandButton2 |
|  | Caption | 4 |
| CommandButton | Name | CommandButton19 |
|  | Caption | 5 |
| CommandButton | Name | CommandButton18 |
|  | Caption | 6 |
| CommandButton | Name | CommandButton7 |
|  | Caption | 7 |
| CommandButton | Name | CommandButton6 |
|  | Caption | 8 |
| CommandButton | Name | CommandButton5 |
|  | Caption | 9 |
| CommandButton | Name | CommandButton22 |
|  | Caption | 0 |
| CommandButton | Name | CommandButton3 |
|  | Caption | pi |
| CommandButton | Name | CommandButton35 |
|  | Caption | = |

## Modules:

### **Module 1: Back Button (🡨)**

Private Sub CommandButton34\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Left(TextBox1.Text, Len(TextBox1.Text) - 1)

End If

End Sub

### **Module 2: Clear Button (Clear)**

Private Sub CommandButton12\_Click()

TextBox1.Text = " "

End Sub

### **Module 3: Natural Log Button (ln)**

Private Sub CommandButton9\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Log(TextBox1.Text)

End If

End Sub

### **Module 4: Common Log Button (log)**

Private Sub CommandButton32\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = Log(TextBox1.Text) / Log(10)

End If

End Sub

### **Module 5: Exponent Button (^)**

Private Sub CommandButton31\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "^"

End If

End Sub

### **Module 6: e Exponent Button (e^)**

Private Sub CommandButton30\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Exp(TextBox1.Text)

End If

End Sub

### **Module 7: Square Root Button (sqrt)**

Private Sub CommandButton8\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Sqr(TextBox1.Text)

End If

End Sub

### **Module 8: Reciprocal Button (1/x)**

Private Sub CommandButton29\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = 1 / TextBox1.Text

End If

End Sub

### **Module 9: Divide Button (/)**

Private Sub CommandButton27\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "/"

End If

End Sub

### **Module 10: Multiply Button (\*)**

Private Sub CommandButton26\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "\*"

End If

End Sub

### **Module 11: Subtarct Button (-)**

Private Sub CommandButton25\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "-"

End If

End Sub

### **Module 12: Add Button (+)**

Private Sub CommandButton24\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "+"

End If

End Sub

### **Module 13: Decimal Button (.)**

Private Sub CommandButton23\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = "."

Else

TextBox1.Value = TextBox1.Value & "."

End If

End Sub

### **Module 14: One Button (1)**

Private Sub CommandButton20\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 1

Else

TextBox1.Value = TextBox1.Value & 1

End If

End Sub

### **Module 15: Two Button (2)**

Private Sub CommandButton17\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 2

Else

TextBox1.Value = TextBox1.Value & 2

End If

End Sub

### **Module 16: Three Button (3)**

Private Sub CommandButton21\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 3

Else

TextBox1.Value = TextBox1.Value & 3

End If

End Sub

### **Module 17: Four Button (4)**

Private Sub CommandButton2\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 4

Else

TextBox1.Value = TextBox1.Value & 4

End If

End Sub

### **Module 18: Five Button (5)**

Private Sub CommandButton19\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 5

Else

TextBox1.Value = TextBox1.Value & 5

End If

End Sub

### **Module 19: Six Button (6)**

Private Sub CommandButton18\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 6

Else

TextBox1.Value = TextBox1.Value & 6

End If

End Sub

### **Module 20: Seven Button (7)**

Public Sub CommandButton7\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 7

Else

TextBox1.Value = TextBox1.Value & 7

End If

End Sub

### **Module 21: Eight Button (8)**

Private Sub CommandButton6\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 8

Else

TextBox1.Value = TextBox1.Value & 8

End If

End Sub

### **Module 22: Nine Button (9)**

Private Sub CommandButton5\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 9

Else

TextBox1.Value = TextBox1.Value & 9

End If

End Sub

### **Module 23: Zero Button (0)**

Private Sub CommandButton22\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 0

Else

TextBox1.Value = TextBox1.Value & 0

End If

End Sub

### **Module 24: Pi Button (pi)**

Private Sub CommandButton3\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 3.14159265

Else

TextBox1.Value = TextBox1.Value & 3.14159265

End If

End Sub

### **Module 25: Equal To Button (=)**

Private Sub CommandButton35\_Click()

If (TextBox1.Value = vbNullString) Then

Dim Var As Variant

Var = MsgBox("Please enter an expression." & vbNewLine & "e.g., 5 + 4", vbExclamation, "Caution!")

Else

TextBox1.Value = Application.Evaluate(TextBox1.Value)

End If

End Sub

### **Module 26: About Label (i)**

Private Sub Label2\_Click()

Dim Var As Variant

Var = MsgBox("Calculator." & vbNewLine & "Version 2.0.1.23 (Build 1251)", 0, "About")

End Sub

## Source Code:

Private Sub CommandButton34\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Left(TextBox1.Text, Len(TextBox1.Text) - 1)

End If

End Sub

Private Sub CommandButton12\_Click()

TextBox1.Text = " "

End Sub

Private Sub CommandButton9\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Log(TextBox1.Text)

End If

End Sub

Private Sub CommandButton32\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = Log(TextBox1.Text) / Log(10)

End If

End Sub

Private Sub CommandButton31\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "^"

End If

End Sub

Private Sub CommandButton30\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Exp(TextBox1.Text)

End If

End Sub

Private Sub CommandButton8\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = Sqr(TextBox1.Text)

End If

End Sub

Private Sub CommandButton29\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Text = 1 / TextBox1.Text

End If

End Sub

Private Sub CommandButton27\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "/"

End If

End Sub

Private Sub CommandButton26\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "\*"

End If

End Sub

Private Sub CommandButton25\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "-"

End If

End Sub

Private Sub CommandButton24\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = TextBox1.Value

Else

TextBox1.Value = TextBox1.Value & "+"

End If

End Sub

Private Sub CommandButton23\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = "."

Else

TextBox1.Value = TextBox1.Value & "."

End If

End Sub

Private Sub CommandButton20\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 1

Else

TextBox1.Value = TextBox1.Value & 1

End If

End Sub

Private Sub CommandButton17\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 2

Else

TextBox1.Value = TextBox1.Value & 2

End If

End Sub

Private Sub CommandButton21\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 3

Else

TextBox1.Value = TextBox1.Value & 3

End If

End Sub

Private Sub CommandButton2\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 4

Else

TextBox1.Value = TextBox1.Value & 4

End If

End Sub

Private Sub CommandButton19\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 5

Else

TextBox1.Value = TextBox1.Value & 5

End If

End Sub

Private Sub CommandButton18\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 6

Else

TextBox1.Value = TextBox1.Value & 6

End If

End Sub

Public Sub CommandButton7\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 7

Else

TextBox1.Value = TextBox1.Value & 7

End If

End Sub

Private Sub CommandButton6\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 8

Else

TextBox1.Value = TextBox1.Value & 8

End If

End Sub

Private Sub CommandButton5\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 9

Else

TextBox1.Value = TextBox1.Value & 9

End If

End Sub

Private Sub CommandButton22\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 0

Else

TextBox1.Value = TextBox1.Value & 0

End If

End Sub

Private Sub CommandButton3\_Click()

If (TextBox1.Value = vbNullString) Then

TextBox1.Value = 3.14159265

Else

TextBox1.Value = TextBox1.Value & 3.14159265

End If

End Sub

Private Sub CommandButton35\_Click()

If (TextBox1.Value = vbNullString) Then

Dim Var As Variant

Var = MsgBox("Please enter an expression." & vbNewLine & "e.g., 5 + 4", vbExclamation, "Caution!")

Else

TextBox1.Value = Application.Evaluate(TextBox1.Value)

End If

End Sub

Private Sub Label2\_Click()

Dim Var As Variant

Var = MsgBox("Calculator." & vbNewLine & "Version 2.0.1.23 (Build 1251)", 0, "About")

End Sub

## Instructions to Execute the Procedure:

1. Open VBA Editor window or Press Alt+F11.
2. Insert userform from the Insert menu.
3. Create design as shown in the above steps..
4. Add Procedures by double clicking on userform.
5. Run the project by hitting F5 key.
6. Hit the buttons on the calculator and see the output on the display area.