

SIMPLE CALCULATOR SYSTEM USING PYTHON

CODES WITH EXPLANATION

```
#!/usr/bin/env python
#-----
# SIMPLE CALCULATOR SYSTEM in Python # Tested with Python 3.6.3
#-----
# Import the math module for root,factotial,sin,cos and tan calculation
import math
# Import all the components from tkinter
from tkinter import*
# -----
# Creat the root window
root = Tk()
# Set the window size
root.geometry("1500x600")
# Set window title
root.title("Scientific Calculator")
# Set the background colour of window
root.configure(background = 'blue')
# -----Set the title bar-----
# bd = Border width in pixels. Default is 2. # Raise is used to express the 3-D effects of
the text
Tops = Frame(root, width = 1000, height = 50, bd = 12, relief = "raise")
# side = top indicates the top site of the window
Tops.pack(side = TOP)
# -----Set the left and right portion of the window----- #
Set the Left side of the window
inBotto1 = Frame(root, width = 900, height = 600, bd = 10, bg = "pink", relief = "raise")
inBotto1.pack(side=LEFT)
# Right side of the window
inBotto2 = Frame(root, width = 600, height = 600, bd = 10, relief ="raise")
inBotto2.pack(side=RIGHT)
#-----
Tops.configure(background = 'black')
inBotto2.configure(background = 'black')
# ("Helvetica", "50") for a 50-point Helvetica regular.
# Anchors are used to define where text is positioned...
lblInfo = Label(Tops, font = ('Helvetica', 70, 'bold'), text = "Simple Calculator System", bd
```

```

= 16, anchor = 'w')
# Relative to a reference point. Here w = 'west' corner of the window
lblInfo.grid(row = 0, column = 0, )
# -----Function perform the different calculation-----
def Sum():
# For ADDITION calculation
    if var.get() == 1:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())
        Sumup = Qty1 + Qty2
        Total.set(Sumup)
# For SUBSTRUCTION calculation
    elif var.get() == 2:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())
        Sumup = Qty1 - Qty2
        Total.set(Sumup)
# For MULTIPLICATION calculation
    elif var.get() == 3:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())
        Sumup = Qty1 * Qty2
        Total.set(Sumup)
# For DIVISION calculation
    elif var.get() == 4:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())
        Sumup = Qty1 / Qty2
        Total.set(Sumup)
# For MODULO DIVISION
    elif var.get() == 5:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())
        Sumup = Qty1 % Qty2
        Total.set(Sumup)
# For EXPONENTIAL calculation
    elif var.get() == 6:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())

```

```

        Sumup = Qty1 ** Qty2
        Total.set(Sumup)
# For FLOOR DIVISION calculation
    elif var.get() == 7:
        Qty1 = float(firstnumber.get())
        Qty2 = float(secondnumber.get())
        Sumup = Qty1 // Qty2
        Total.set(Sumup)
# For LOGARITHM calculation(Here only the first number column is used)
    elif var.get() == 8:
        Qty1 = float(firstnumber.get())
        Sumup = math.log(Qty1)
        Total.set(Sumup)
# For DECIMAL -> BINARY conversation(Here only the first number column is used)
    elif var.get() == 9:
        Qty1 = float(firstnumber.get())
# Call the binary() function
        Sumup = binary(Qty1)
        Total.set(Sumup)
# For SQUARE ROOT of number(Here only the first number column is used)
    elif var.get() == 10:
        Qty1 = float(firstnumber.get())
        Sumup = math.sqrt(Qty1)
        Total.set(Sumup)
# For FACTORIAL(Here only the first number column is used)
    elif var.get() == 11:
        Qty1 = float(firstnumber.get())
        Sumup = factorial(Qty1)
        Total.set(Sumup)
# For SINE value of degree(Here only the first number column is used)
    elif var.get() == 12:
        Qty1 = float(firstnumber.get())
        Sumup = math.sin(math.radians(Qty1))
        Total.set(Sumup)
# For COSINE value of degree
    elif var.get() == 13:
        Qty1 = float(firstnumber.get())
        Sumup = math.cos(math.radians(Qty1))
        Total.set(Sumup)

```

For TANGENT value of degree

```
elif var.get() == 14:
    Qty1 = float(firstnumber.get())
    Sumup = math.tan(math.radians(Qty1))
    Total.set(Sumup)
```

For PERCENTAGE calculation

```
elif var.get() == 15:
    Qty1 = (firstnumber.get())
    Qty2 = (secondnumber.get())
    Sumup = (Qty2/Qty1) * 100
    Total.set(Sumup)
```

FUNCTION for evaluate the factorial of a number

```
def factorial(n):
    if n == 0:
        return 1
    else:
        return n * factorial(n-1)
```

the function which is called from

```
elif var.get() == 9:
    def binary(f):
        if f >= 1:
            g = int(math.log(f, 2))
        else:
            g = -1
            h = g + 1
            ig = math.pow(2, g)
            st = " "
        while f > 0 or ig >= 1:
            if f < 1:
                if len(st[h:]) >= 10: # 10 fractional digits max break
                    if f >= ig:
                        st += "1"
                    f -= ig else:
                        st += "0"
                    ig /= 2
                st = st[:h] + "." + st[h:]
            return st
```

FUNCTION that set 1st, 2nd and Total as '0.0' if the RESET button is pressed

```
def Reset():
    firstnumber.set("0.0")
```

```

secondnumber.set("0.0")
Total.set("0.0")
# Function show a meggagebox that ask the user if he wants to exit..
def Exit(): # if the EXIT button is pressed
    qExit = messagebox.askyesno("System","Do you want to exit ?")
    if qExit > 0: # root.destroy() --> use for closing the window screen
        root.destroy()
    return

# -----
# Create a tkinter() variable of Integer type
var = DoubleVar()
firstnumber = DoubleVar()
secondnumber = DoubleVar()
Total = DoubleVar()

# -----Radio Buttons for different operation-----
rb1 = Radiobutton(inBotto1, text = "Addition", variable = var, value = 1, bg = "pink", font
= ('Helvetica', 21, 'bold')).grid(row = 0, column = 0, sticky = W)
rb2 = Radiobutton(inBotto1, text = "Substraction", variable = var, value = 2 bg = "pink",
font = ('Helvetica', 21, 'bold')) .grid(row = 1, column = 0, sticky = W)
rb3 = Radiobutton(inBotto1, text = "Multiplication", variable = var, value = 3 bg = "pink",
font = ('Helvetica', 21, 'bold')) .grid(row = 2, column = 0, sticky = W)
rb4 = Radiobutton(inBotto1, text = "Division", variable = var, value = 4, bg = "pink", font
= ('Helvetica', 21, 'bold')).grid(row = 3, column = 0, sticky = W)
rb5 = Radiobutton(inBotto1, text = "Modulus", variable = var, value = 5, bg = "pink", font
= ('Helvetica', 21, 'bold')).grid(row = 4, column = 0, sticky = W)
rb6 = Radiobutton(inBotto1, text = "Exponent", variable = var, value = 6, bg = "pink",
font = ('Helvetica', 21, 'bold')).grid(row = 0, column = 1, sticky = W)
rb7 = Radiobutton(inBotto1, text = "Floor Division", variable = var, value = 7, bg = "pink",
font = ('Helvetica', 21, 'bold')) .grid(row = 3, column = 1, sticky = W)
rb8 = Radiobutton(inBotto1, text = "Logarithm", variable = var, value = 8, bg = "pink",
font = ('Helvetica', 21, 'bold')) .grid(row = 2, column = 1, sticky = W)
rb9 = Radiobutton(inBotto1, text = "Binary", variable = var, value = 9, bg = "pink",font =
('Helvetica', 21, 'bold')).grid(row = 4, column = 1, sticky = W)
rb10 = Radiobutton(inBotto1, text = "Root", variable = var, value = 10, bg = "pink", font =
('Helvetica', 21, 'bold')).grid(row = 1, column = 1, sticky = W)
rb11 = Radiobutton(inBotto1, text = "Factorial", variable = var, value = 11, bg = "pink",
font = ('Helvetica', 21, 'bold')) .grid(row = 0, column = 2, sticky = W)
rb12 = Radiobutton(inBotto1, text = "Sine", variable = var, value = 12, bg = "pink", font =
('Helvetica', 21, 'bold')).grid(row = 2, column = 2, sticky = W)

```

```

rb13 = Radiobutton(inBotto1, text = "Cosine", variable = var, value = 13, bg = "pink",
font = ('Helvetica', 21, 'bold')).grid(row = 3, column = 2, sticky =W)
rb14 = Radiobutton(inBotto1, text = "Tangent", variable = var, value = 14, bg = "pink",
font = ('Helvetica', 21, 'bold')).grid(row = 4, column = 2, sticky =W)
rb15 = Radiobutton(inBotto1, text = "Percentage", variable = var, value = 15, bg =
"pink", font = ('Helvetica', 21, 'bold')).grid(row = 1, column = 2, sticky =W)
# -----Set first, second and total column-----
lblfirstnumber = Label(inBotto1, font = ('Helvetica',23, 'bold'), text = "Enter First
Number", bg = "pink", fg = "black", bd = 16)
lblfirstnumber.grid(row = 5, column = 0, sticky = W)
textfirstnumber = Entry(inBotto1, font = ('Helvetica',23, 'bold'), bd = 4, width = 13, bg =
"orange", textvariable = firstnumber) .grid(row = 5, column = 1, sticky = W)
lblsecondnumber = Label(inBotto1, font = ('Helvetica', 23, 'bold') , text = "Enter Second
Number", bg = "pink", fg = "black", bd = 16)
lblsecondnumber.grid(row = 6, column = 0, sticky = W)
textsecondnumber = Entry(inBotto1, font = ('Helvetica', 23, 'bold'), bd = 4, width = 13, bg
= "orange", textvariable = secondnumber) .grid(row = 6, column = 1, sticky = W)
lblTotal = Label(inBotto1, font = ('Helvetica', 23, 'bold'), text = "Answer", fg = "black", bg
= "pink", bd = 16, justify = "left")
lblTotal.grid(row = 7, column = 0, sticky = W)
lblAnswer = Label(inBotto1,font = ('Helvetica', 23, 'bold'), bd = 4, width = 20,bg =
"orange", textvariable = Total, relief ='sunken') .grid(row = 7, column = 1, sticky = W)
# -----Set the Result, Reset and Exit Button-----
btnTotal = Button(inBotto2, pady = 8, bd = 8, fg = "black", font = ('Helvetica', 25, 'bold'),
width = 16, height = 2 , text = "Result", bg = "light green",command = Sum) .grid(row =
0, column = 0)
btnReset = Button(inBotto2, pady = 8, bd = 8, fg = "black", font = ('Helvetica', 25, 'bold'),
width = 16, height = 2, text = "Reset", bg = "yellow", command = Reset).grid(row = 1,
column = 0)
btnExit = Button(inBotto2, pady = 8, bd = 8, fg = "black", font = ('Helvetica', 25, 'bold'),
width = 16, height = 2, text = "Exit", bg = "red",command =Exit) .grid(row = 2, column =
0)

# -----Display the ultimate result-----
# Wait and watch for any events that may take place in the root window
root.mainloop ()OUTPUTCONCLUSION

```