TASK 9 (GUI Applications) a. Write a Python program that works as a simple calculator. Use a grid to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

```
# Python program to create a simple GUI
# calculator using Tkinter

# import everything from tkinter module
from tkinter import *

# globally declare the expression variable
expression = ""


# Function to update expression
# in the text entry box
def press(num):
      # point out the global expression variable
      global expression

      # concatenation of string
      expression = expression + str(num)

      # update the expression by using set method
      equation.set(expression)


# Function to evaluate the final expression
def equalpress():
      # Try and except statement is used
      # for handling the errors like zero
      # division error etc.

      # Put that code inside the try block
      # which may generate the error
      try:

            global expression

            # eval function evaluate the expression
            # and str function convert the result
            # into string
            total = str(eval(expression))

            equation.set(total)

            # initialize the expression variable
            # by empty string
            expression = ""

      # if error is generate then handle
      # by the except block
      except:

            equation.set(" error ")
            expression = ""


# Function to clear the contents
# of text entry box
def clear():
      global expression
      expression = ""
      equation.set("")


# Driver code
if __name__ == "__main__":
      # create a GUI window
      gui = Tk()

      # set the background colour of GUI window
      gui.configure(background="light green")

      # set the title of GUI window
      gui.title("Simple Calculator")

      # set the configuration of GUI window
      gui.geometry("270x150")

      # StringVar() is the variable class
      # we create an instance of this class
      equation = StringVar()

      # create the text entry box for
      # showing the expression .
      expression_field = Entry(gui, textvariable=equation)

      # grid method is used for placing
      # the widgets at respective positions
      # in table like structure .
      expression_field.grid(columnspan=4, ipadx=70)

      # create a Buttons and place at a particular
      # location inside the root window .
      # when user press the button, the command or
      # function affiliated to that button is executed .
      button1 = Button(gui, text=' 1 ', fg='black', bg='red',
                             command=lambda: press(1), height=1,
width=7)
      button1.grid(row=2, column=0)
      button2 = Button(gui, text=' 2 ', fg='black', bg='red',
                             command=lambda: press(2), height=1,
width=7)
      button2.grid(row=2, column=1)

      button3 = Button(gui, text=' 3 ', fg='black', bg='red',
                             command=lambda: press(3), height=1,
width=7)
      button3.grid(row=2, column=2)

      button4 = Button(gui, text=' 4 ', fg='black', bg='red',
                             command=lambda: press(4), height=1,
width=7)
      button4.grid(row=3, column=0)

      button5 = Button(gui, text=' 5 ', fg='black', bg='red',
                             command=lambda: press(5), height=1,
width=7)
      button5.grid(row=3, column=1)

      button6 = Button(gui, text=' 6 ', fg='black', bg='red',
                             command=lambda: press(6), height=1,
width=7)
      button6.grid(row=3, column=2)

      button7 = Button(gui, text=' 7 ', fg='black', bg='red',
                             command=lambda: press(7), height=1,
width=7)
      button7.grid(row=4, column=0)

      button8 = Button(gui, text=' 8 ', fg='black', bg='red',
                             command=lambda: press(8), height=1,
width=7)
      button8.grid(row=4, column=1)

      button9 = Button(gui, text=' 9 ', fg='black', bg='red',
                             command=lambda: press(9), height=1,
width=7)
      button9.grid(row=4, column=2)

      button0 = Button(gui, text=' 0 ', fg='black', bg='red',
                             command=lambda: press(0), height=1,
width=7)
      button0.grid(row=5, column=0)

      plus = Button(gui, text=' + ', fg='black', bg='red',
                       command=lambda: press("+"), height=1, width=7)
      plus.grid(row=2, column=3)

      minus = Button(gui, text=' - ', fg='black', bg='red',
                       command=lambda: press("-"), height=1, width=7)
      minus.grid(row=3, column=3)

      multiply = Button(gui, text=' * ', fg='black', bg='red',
                              command=lambda: press("*"), height=1,
width=7)
      multiply.grid(row=4, column=3)

      divide = Button(gui, text=' / ', fg='black', bg='red',
                              command=lambda: press("/"), height=1,
width=7)
      divide.grid(row=5, column=3)

      equal = Button(gui, text=' = ', fg='black', bg='red',
                        command=equalpress, height=1, width=7)
      equal.grid(row=5, column=2)

      clear = Button(gui, text='Clear', fg='black', bg='red',
                        command=clear, height=1, width=7)
      clear.grid(row=5, column='1')

      Decimal= Button(gui, text='.', fg='black', bg='red',
                              command=lambda: press('.'), height=1,
width=7)
      Decimal.grid(row=6, column=0)
      # start the GUI
      gui.mainloop()
```

b. Develop a Python GUI application that receives an integer in one text field, and computes its factorial Value and fills it in another text field, when the button named “Compute” is clicked

```
import tkinter as tk
from tkinter.colorchooser import *

def factorial(n):
  # single line to find factorial
  return 1 if (n==1 or n==0) else n * factorial(n - 1);

def calculate():
  result=factorial(int(entryText.get()))
  info.config(text=result)

mw = tk.Tk()
```

```
mw.title('COLOR ME!!!')
mw.geometry("200x200")
mw.resizable(0, 0)

entryText = tk.Entry(text=1, bg='white', fg='black')
entryText.place(x = 50, y = 25, width=100, height=25)

btn = tk.Button(text='Calculate', command=calculate)
btn.place(x = 50, y = 75, width=100, height=25)

info = tk.Label(text='result', bg='white', fg='black')
info.place(x = 50, y = 125, width=100, height=25)

mw.mainloop()
```