Project 2: Simple Calculator

Introduction

This project is a simple calculator developed using Python's Tkinter library. It provides a graphical user interface (GUI) where users can perform basic arithmetic operations such as addition, subtraction, multiplication, and division. The goal of this project is to demonstrate how to build an interactive desktop application using Tkinter.

Features

- User-friendly interface built with Tkinter
- Buttons for digits (0-9), operations (+, -, *, /), decimal point, clear, and equals
- Real-time evaluation of expressions
- Displays results or error messages as needed

Main Components

1. Entry Widget: Used for input and output display.
2. Buttons: Represent digits and operations. They are arranged in a grid layout.
3. Functions: Handle user input, perform calculations, and manage the interface.

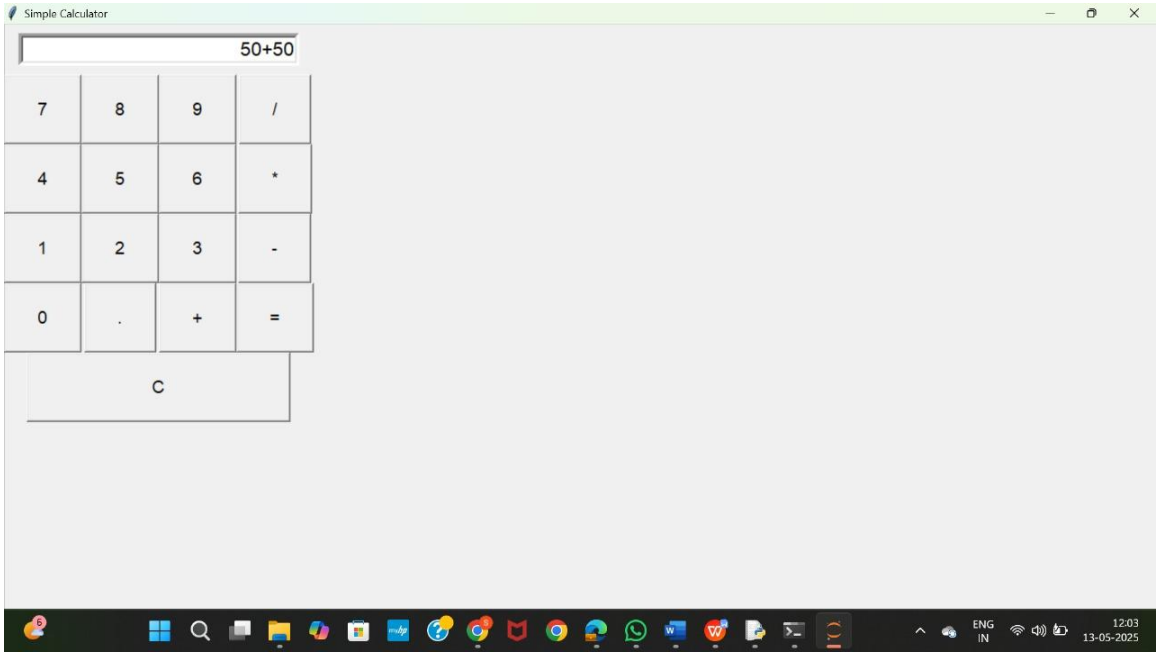
Source Code

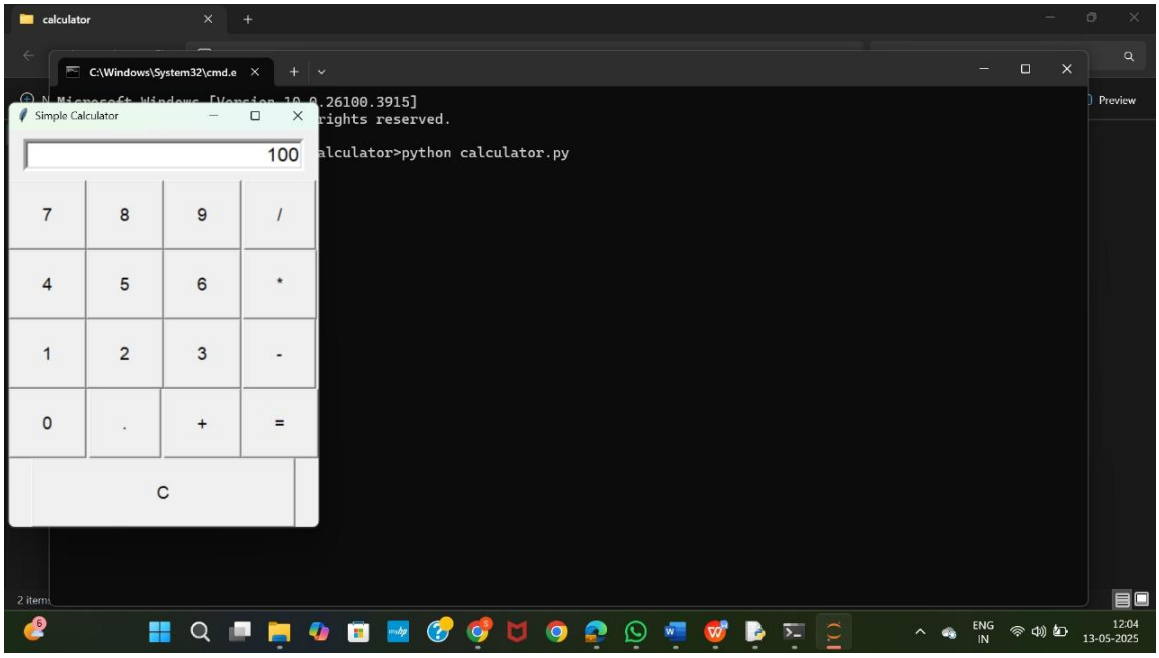
```
import tkinter as tk

root = tk.Tk()
root.title("Simple Calculator")

entry = tk.Entry(root, width=25, borderwidth=5, font=('Arial', 16), justify='right')
entry.grid(row=0, column=0, columnspan=4, padx=10, pady=10)

def click(button_text):
    current = entry.get()
    entry.delete(0, tk.END)
    entry.insert(0, current + button_text)

def clear():
    entry.delete(0, tk.END)

def calculate():
    try:
        result = eval(entry.get())
        entry.delete(0, tk.END)
        entry.insert(0, str(result))
    except:
        entry.delete(0, tk.END)
        entry.insert(0, "Error")

buttons = [
    ('7', 1, 0), ('8', 1, 1), ('9', 1, 2), ('/', 1, 3),
    ('4', 2, 0), ('5', 2, 1), ('6', 2, 2), ('*', 2, 3),
    ('1', 3, 0), ('2', 3, 1), ('3', 3, 2), ('-', 3, 3),
    ('0', 4, 0), ('.', 4, 1), ('+', 4, 2), ('=', 4, 3),
    ('C', 5, 0)
]

for (text, row, col) in buttons:
    if text == '=':
        tk.Button(root, text=text, padx=30, pady=20, font=('Arial', 14),
```

```
            command=calculate).grid(row=row, column=col)
    elif text == 'C':
        tk.Button(root, text=text, padx=132, pady=20, font=('Arial', 14),
            command=clear).grid(row=row, column=col, columnspan=4)
    else:
        tk.Button(root, text=text, padx=30, pady=20, font=('Arial', 14),
            command=lambda t=text: click(t)).grid(row=row, column=col)

root.mainloop()
```

Output and Usage

When the program is executed, a calculator window appears. Users can click on number buttons and operation buttons to build expressions. Pressing the '=' button evaluates the expression, and the result is shown in the entry field. Pressing 'C' clears the input.





Conclusion

This simple calculator project is an excellent introduction to GUI development with Python. It helps learners understand Tkinter layout, event handling, and basic error management. This project can be extended to include advanced features like parentheses, keyboard input, and scientific functions.