Laboratory Activity No. 8	
Converting TUI to GUI Programs	
Course Code: CPE103	**Program:** BSCPE
Course Title: Object-Oriented Programming	**Date Performed:**
Section:	**Date Submitted:**
Name:	**Instructor:**

1. Objective(s):

This activity aims to convert a TUI program to GUI program with the Pycharm framework

2. Intended Learning Outcomes (ILOs):

The students should be able to:
2.1 Identify the main components in a GUI Application
2.2 Create a simple GUI Application that converts TUI program to GUI program

3. Discussion:

In general, programs consist of three components—input, processing, and output. In TUI programs, input is usually obtained from an input statement or by importing data from a file. Output is usually given by a print statement or stored in a file. When we convert a TUI program to a GUI program, we replace input and print statements with Label/Entry pairs. Processing data and inputting and outputting data to files works much the same in both types of programs. The primary difference is that the processing in GUI programs is usually triggered by an event

4. Materials and Equipment:

Desktop Computer with Anaconda Python or Pycharm
Windows Operating System

5. Procedure:

1. Type these codes in Pycharm:

```
#TUI Form
def main():
   # Find the largest number among three numbers
   L = []
   num1 = eval(input("Enter the first number:"))
   L.append(num1)
   num2 = eval(input("Enter the second number:"))
   L.append(num2)
   num3 = eval(input("Enter the third number:"))
   L.append(num3)
   print("The largest number among the three is:",str(max(L)))
 main()
```

2. Run the program and observe the output.

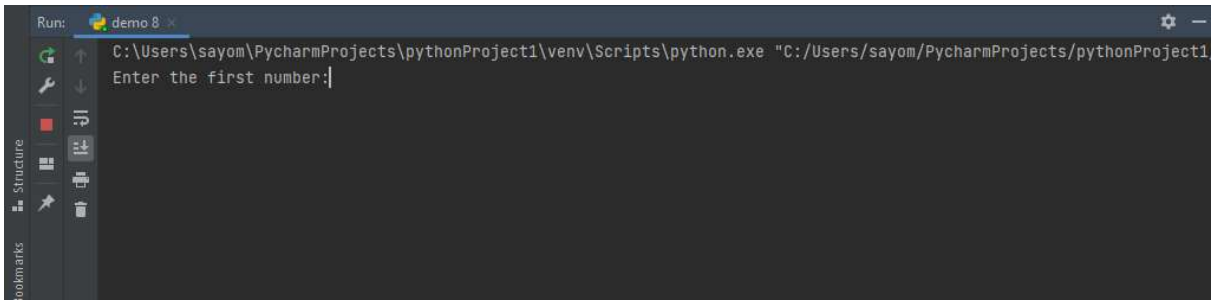


Figure 1. TUI form

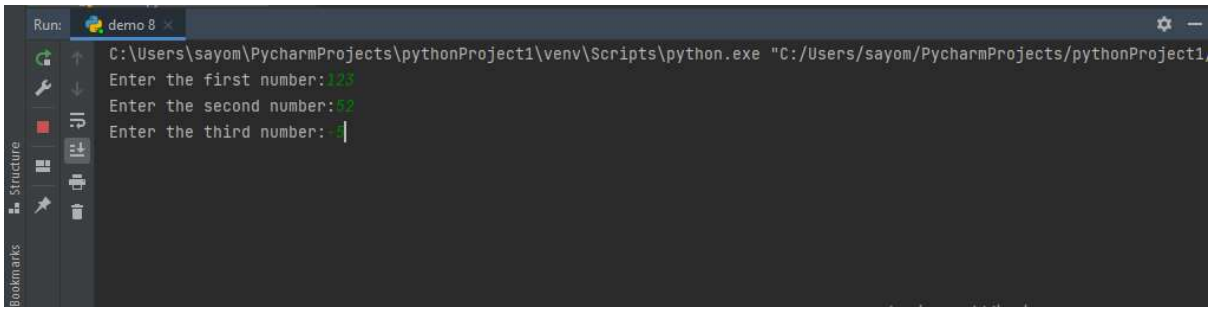


Figure 1(a) TUI form with three input numbers

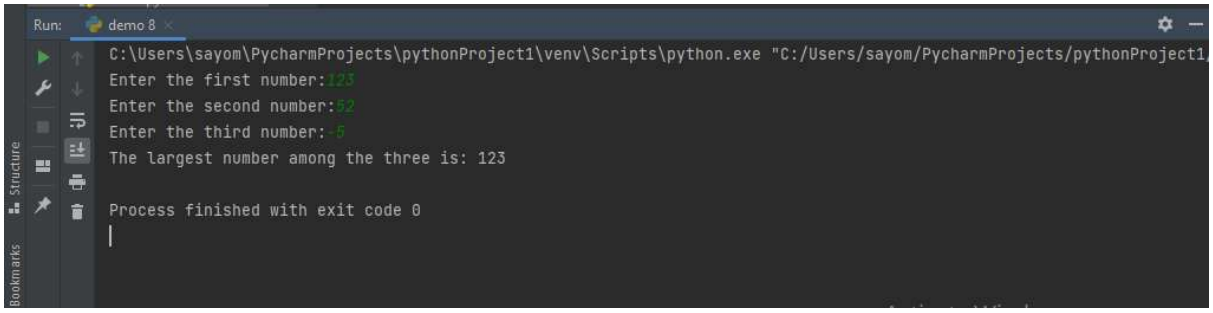
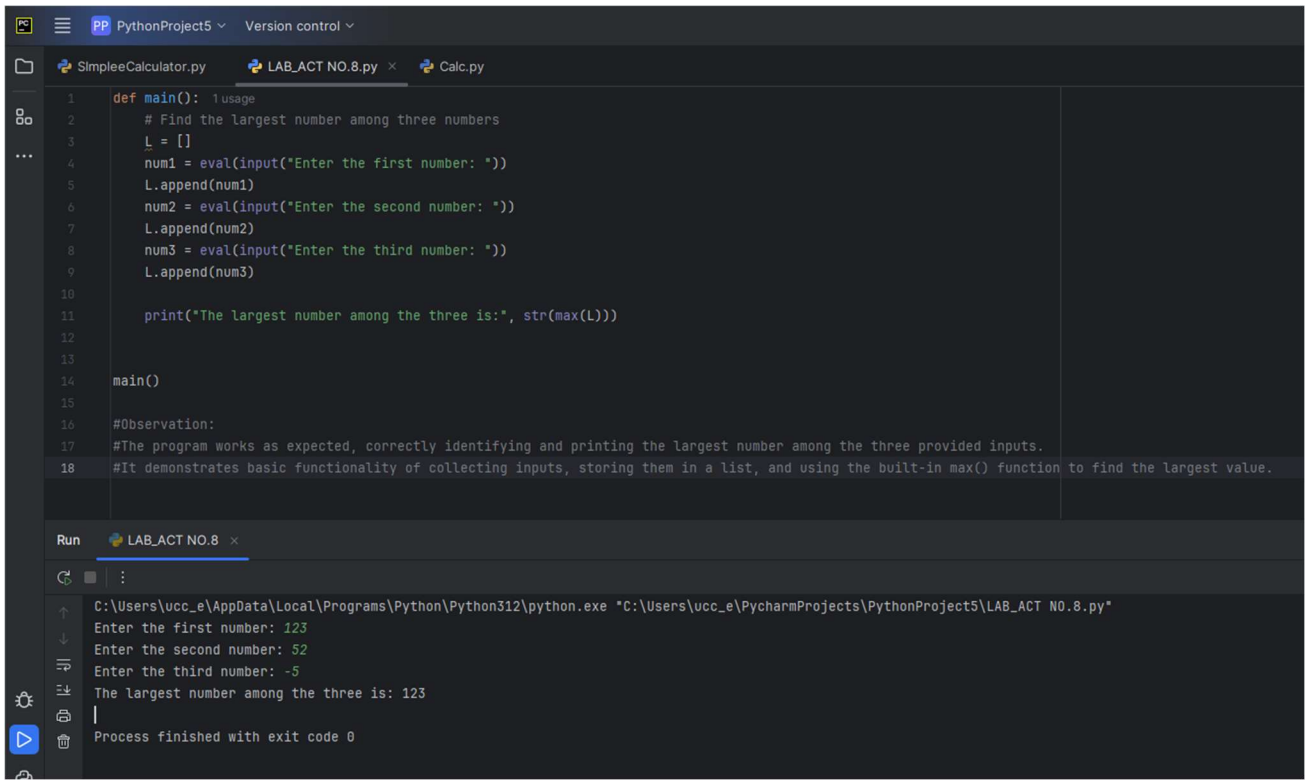


Figure 1(b) TUI form with output "The largest number among the three"

Method 1 above shows a TUI program and a possible output in Figures 1(a) and (b) while Figure 2 shows the output of the GUI program in Method 2.

OBSERVATION: The program works as expected, correctly identifying and printing the largest number among the three provided inputs. It demonstrates the basic functionality of collecting inputs, storing them in a list, and using the built-in max() function to find the largest value.



5. Procedure:

Method 2

```
from tkinter import *

window = Tk()
window.title("Find the largest number")
window.geometry("400x300+20+10")

def findLargest():
    L = []
    L.append(eval(conOfent2.get()))
    L.append(eval(conOfent3.get()))
    L.append(eval(conOfent4.get()))
    conOfLargest.set(max(L))

lbl1 = Label(window, text = "The Program that Finds the Largest Number")
lbl1.grid(row=0, column=1, columnspan=2,sticky=EW)
lbl2 = Label(window,text = "Enter the first number:")
lbl2.grid(row=1, column = 0,sticky=W)
conOfent2 = StringVar()
ent2 = Entry(window,bd=3,textvariable=conOfent2)
ent2.grid(row=1, column = 1)
lbl3 = Label(window,text = "Enter the second number:")
lbl3.grid(row=2, column=0)
conOfent3=StringVar()
ent3 = Entry(window,bd=3,textvariable=conOfent3)
ent3.grid(row=2,column=1)
lbl4 = Label(window,text="Enter the third number:")
lbl4.grid(row=3,column =0, sticky=W)
conOfent4 = StringVar()
ent4 = Entry(window,bd=3,textvariable=conOfent4)
ent4.grid(row=3, column=1)
```

```
btn1 = Button(window,text = "Find the largest no.",command=findLargest)
btn1.grid(row=4, column = 1)
lbl5 = Label(window,text="The largest number:")
lbl5.grid(row=5,column=0,sticky=W)
conOfLargest = StringVar()
ent5 = Entry(window,bd=3,state="readonly",textvariable=conOfLargest)
ent5.grid(row=5,column=1)

mainloop()
```

Results 2

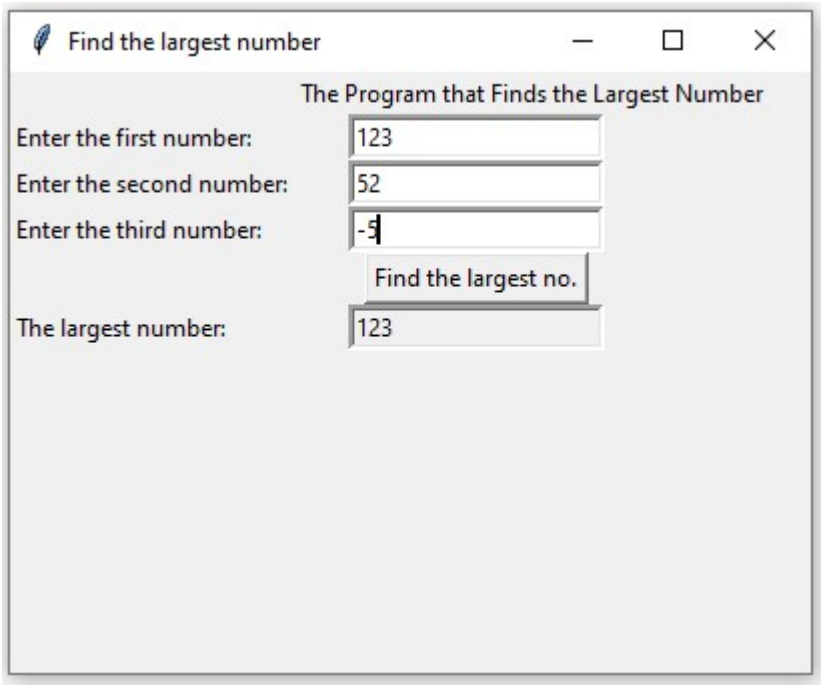
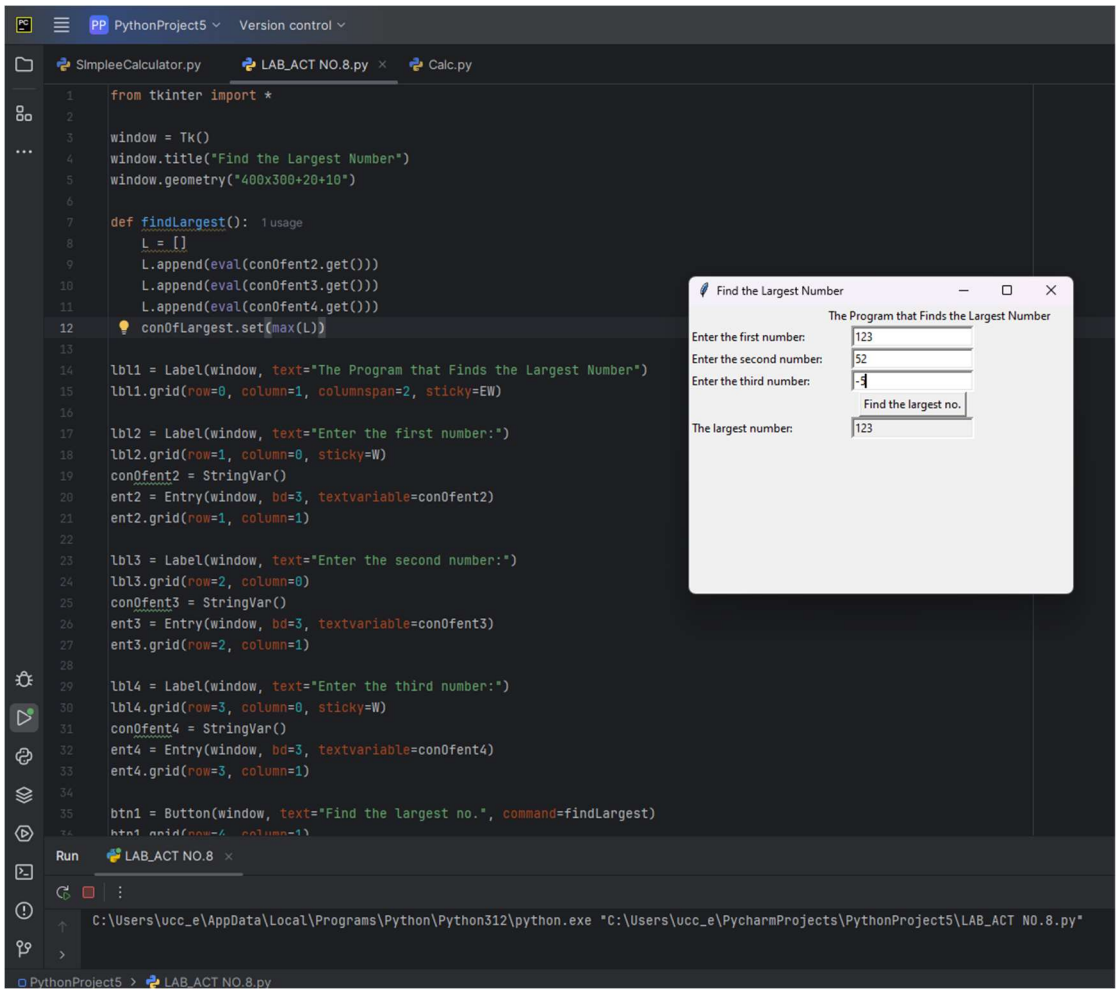


Figure 2. GUI program to find the largest number

OUTPUT:


PythonProject5
Version control
SimpleeCalculator.py
LAB_ACT NO.8.py
Calc.py
from tkinter import *
window = Tk()
window.title("Find the Largest Number")
window.geometry("400x300+20+10")
def findLargest(): 1 usage
L = []
L.append(eval(conOfent2.get()))
L.append(eval(conOfent3.get()))
L.append(eval(conOfent4.get()))
conOfLargest.set(max(L))
lbl1 = Label(window, text="The Program that Finds the Largest Number")
lbl1.grid(row=0, column=1, columnspan=2, sticky=EW)
lbl2 = Label(window, text="Enter the first number:")
lbl2.grid(row=1, column=0, sticky=W)
conOfent2 = StringVar()
ent2 = Entry(window, bd=3, textvariable=conOfent2)
ent2.grid(row=1, column=1)
lbl3 = Label(window, text="Enter the second number:")
lbl3.grid(row=2, column=0)
conOfent3 = StringVar()
ent3 = Entry(window, bd=3, textvariable=conOfent3)
ent3.grid(row=2, column=1)
lbl4 = Label(window, text="Enter the third number:")
lbl4.grid(row=3, column=0, sticky=W)
conOfent4 = StringVar()
ent4 = Entry(window, bd=3, textvariable=conOfent4)
ent4.grid(row=3, column=1)
btn1 = Button(window, text="Find the largest no.", command=findLargest)
Find the Largest Number
The Program that Finds the Largest Number
Enter the first number:
123
Enter the second number:
52
Enter the third number:
-5
Find the largest no.
The largest number:
123
Run
LAB_ACT NO.8
C:\Users\ucc_e\AppData\Local\Programs\Python\Python312\python.exe "C:\Users\ucc_e\PycharmProjects\PythonProject5\LAB_ACT NO.8.py"
PythonProject5 > LAB_ACT NO.8.py

Questions

1. What is TUI in Python?

TUI is used for text-based applications, often in the terminal or console.

2. How to make a TUI in Python?

GUI is used for visually rich applications with graphical elements like buttons and images.

3. What is the difference between TUI and GUI?

TUI is great for simplicity and efficiency in certain contexts (e.g., low-resource environments), GUI offers a more visually engaging and user-friendly experience for most modern desktop or mobile applications.

6. Supplementary Activity:

TUI Implementation

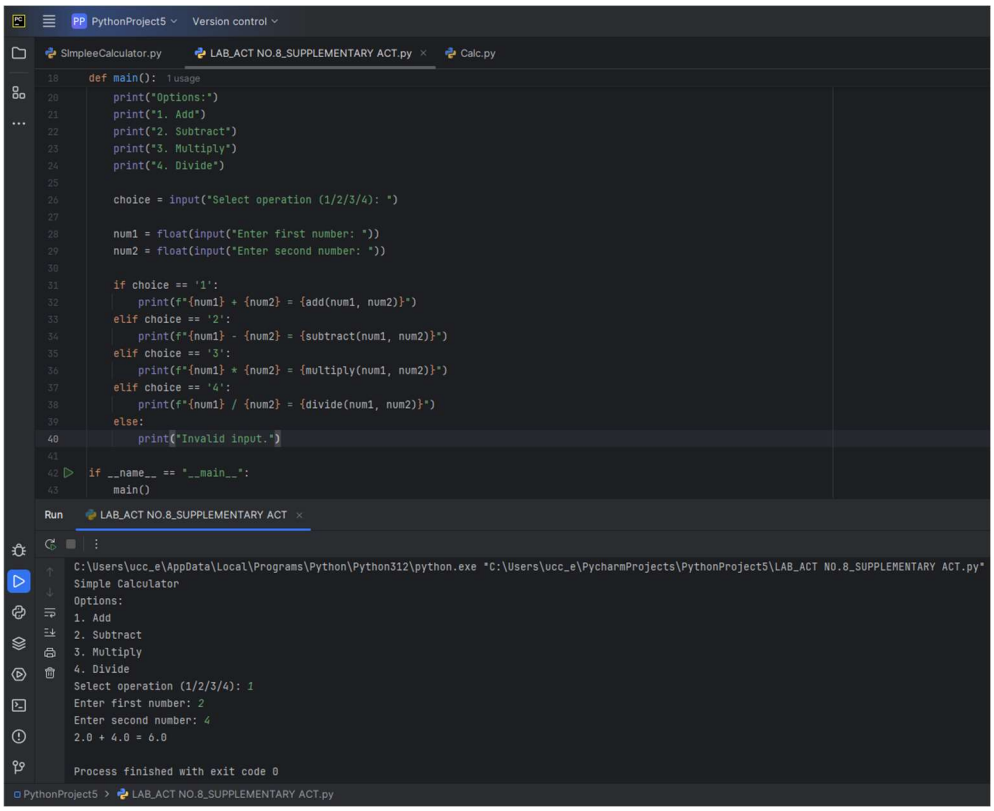
```
# Simple TUI Calculator

def add(a, b):
    return a + b

def subtract(a, b):
return a - b

def multiply(a, b):
    return a * b

def divide(a, b):
    if b != 0:
        return a / b
    else:
        return "Error! Division by zero."

def main():
    print("Simple Calculator")
    print("Options:")
    print("1. Add")
    print("2. Subtract")
    print("3. Multiply")
    print("4. Divide")

    choice = input("Select operation (1/2/3/4): ")

    num1 = float(input("Enter first number: "))
    num2 = float(input("Enter second number: "))

    if choice == '1':
        print(f"{num1} + {num2} = {add(num1, num2)}")
    elif choice == '2':
        print(f"{num1} - {num2} = {subtract(num1, num2)}")
    elif choice == '3':
        print(f"{num1} * {num2} = {multiply(num1, num2)}")
    elif choice == '4':
```

```
        print(f"{num1} / {num2} = {divide(num1, num2)}")
    else:
        print("Invalid input.")

if __name___== "__main__":
    main()
```

GUI Conversion of the Calculator:

```
import tkinter as tk

# Functions for calculation
def add():
    result.set(float(entry1.get()) + float(entry2.get()))

def subtract():
    result.set(float(entry1.get()) - float(entry2.get()))

def multiply():
    result.set(float(entry1.get()) * float(entry2.get()))

def divide():
    try:
        result.set(float(entry1.get()) / float(entry2.get()))
    except ZeroDivisionError:
        result.set("Error! Division by zero.")

# Create the main window
root = tk.Tk()
root.title("Simple Calculator")

# Create StringVar to hold the result
result = tk.StringVar()

# Create the layout
tk.Label(root, text="Enter first number:").grid(row=0, column=0)
entry1 = tk.Entry(root)
entry1.grid(row=0, column=1)

tk.Label(root, text="Enter second number:").grid(row=1, column=0)
entry2 = tk.Entry(root)
entry2.grid(row=1, column=1)

# Buttons for operations
tk.Button(root, text="Add", command=add).grid(row=2, column=0)
tk.Button(root, text="Subtract", command=subtract).grid(row=2, column=1)
tk.Button(root, text="Multiply", command=multiply).grid(row=3, column=0)
tk.Button(root, text="Divide", command=divide).grid(row=3, column=1)

# Label to show result
tk.Label(root, text="Result:").grid(row=4, column=0)
result_label = tk.Label(root, textvariable=result)
result_label.grid(row=4, column=1)

# Start the main loop
root.mainloop()
```

TUI IMPLEMENTATION:

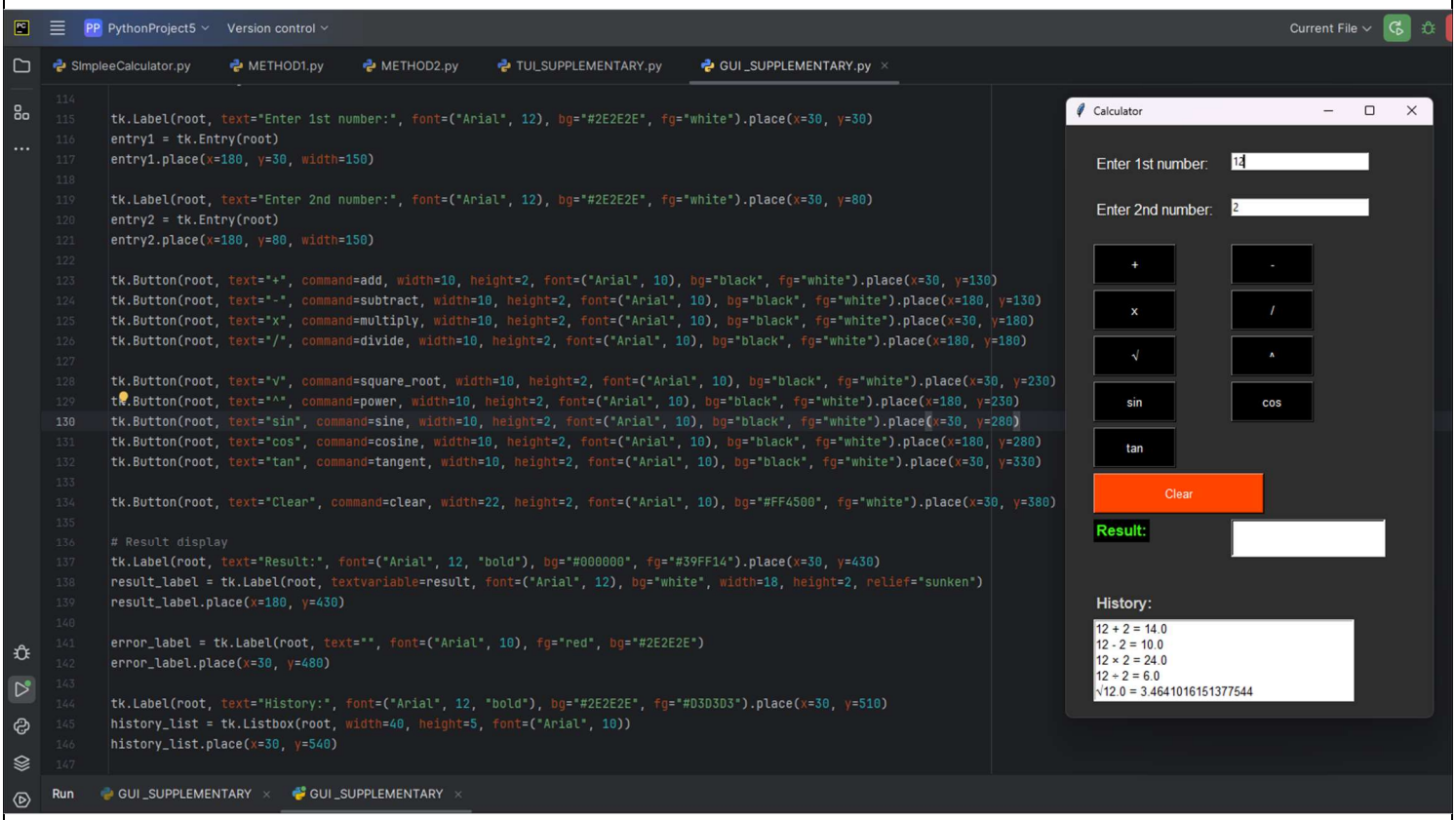


Once you've successfully created the GUI version of the calculator, try adding the following features to enhance the program:

1. **Clear Button**: Add a button to clear the input fields and reset the result.
2. **History Feature**: Add a list or label to show the history of operations performed.
3. **Advanced Operations**: Implement additional operations such as square roots, powers, or trigonometric functions.
4. **Input Validation**: Add validation to ensure that the user only enters numeric values in the input fields.

Styling: Experiment with different styles (font sizes, button colors) to improve the appearance of the GUI.

GUI IMPLEMENTATION:



CONCLUSION:

The process of transforming a Text User Interface (TUI) application into a Graphical User Interface (GUI) program was taught to us in this lab. The way input and output are handled is the fundamental distinction, even though the data processing mechanism is still the same. Text-based statements are used for input in TUI programs, and the screen is printed with the results. In GUI programs, graphical elements such as entry fields are used to receive input, while labels are used to display output. Event-driven programming, where user actions (such as clicking buttons) initiate processing, is the main difference in GUI systems. The significance of comprehending the distinctions between TUI and GUI programming specifically, the requirement for managing events in GUI applications is emphasized in this lab.