

Laboratory Activity No. 8

Converting TUI to GUI Programs

Course Code: CPE103	Program: BSCPE
Course Title: Object-Oriented Programming	Date Performed: March 15, 2025
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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.

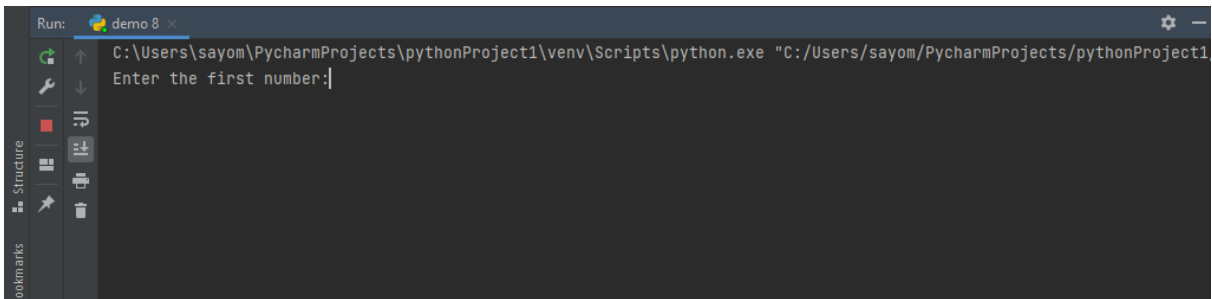


Figure 1. TUI form

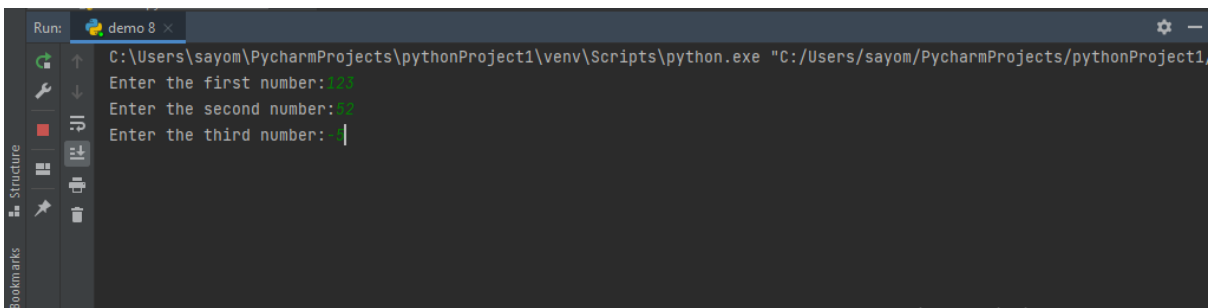


Figure 1(a) TUI form with three input numbers

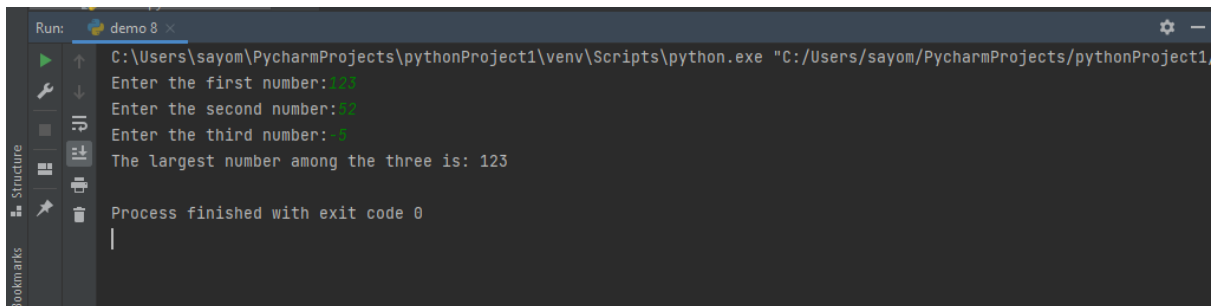


Figure 1(b) TUI form with output “The largest number among the three”

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.

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

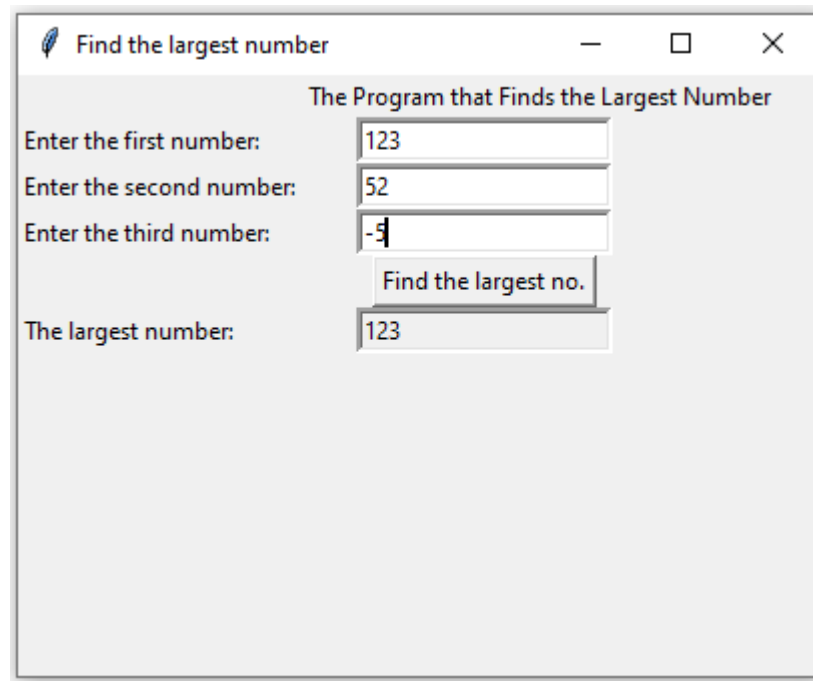


Figure 2. GUI program to find the largest number

Questions

1. What is TUI in Python?
 - Python TUI (Text User Interface) is a type of interface that handles nothing but text inputs and outputs.
2. How to make a TUI in Python?
 - TUI in Python can be created with libraries or basic `print()` and `input()`.
3. What is the difference between TUI and GUI?

 - TUI only uses text-based inputs and outputs, whereas GUI (Graphical User Interface) employs visual objects such as buttons, windows, and icons.

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()
```

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

6. Conclusion

- GUI and TUI are both interfaces, where TUI is text command-oriented and less resource-intensive and GUI offers a visual and interactive interface. It is a matter of usability, system resources, and user choice to use either.

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