GUI programs

in python

What is GUI ?

GUI (Graphical User Interface) means using pictures, buttons, and windows to interact with a computer instead of typing commands(CLI).

How do we create GUI ?

We create a GUI using GUI libraries or frameworks like **Tkinter**, **PyQt**, or **Kivy** in Python. Here we will use tkinter.

Steps

Step1: Install tkinter

Windows: *pip install tk*
Mac: *brew install python-tk*
Linux: *sudo apt install python3-tk*

Step2: import tkinter to your python program

import tkinter as tk

Step3:

root = tk.Tk() # Creates the main window of the GUI
root.mainloop() # Keeps the window open and listens for user actions (like clicks)

NOTE: you can run this in stage, if you do so, you will get a blank window. We will write the elements inside this 2 lines in most of the cases.

Example Code:

```
import tkinter as tk  # Import the tkinter module

root = tk.Tk()  # Create the main window
root.title("My First GUI")  # Set the window title
root.geometry("300x200")  # Set window size (width x height)

label = tk.Label(root, text="Hello, Tkinter!")  # Create a label
label.pack(pady=20)  # Add the label to the window with some space

button = tk.Button(root, text="Click Me", command=lambda: label.config(text="Button Clicked!"))
button.pack()  # Add the button to the window

root.mainloop()  # Run the GUI loop (keeps the window open)
```

Important properties of tkinter

COMMON WIDGETS

Widget	Purpose	Example
Label	Shows text	`tk.Label(root, text="Hello")`
Button	Clickable button	`tk.Button(root, text="Click", command=func)`
Entry	Single-line input	`tk.Entry(root)`
Text	Multi-line input	`tk.Text(root, height=5, width=30)`
Checkbutton	Checkbox	`tk.Checkbutton(root, text="Agree")`
Radiobutton	Choose one option	`tk.Radiobutton(root, text="Yes", value=1)`
Frame	Groups widgets	`tk.Frame(root)`
Canvas	Draw shapes or images	`tk.Canvas(root, width=200, height=100)`
Listbox	Shows a list	`tk.Listbox(root)`

LAYOUT METHODS

Method	Use
`.pack()`	Stack widgets vertically or horizontally
`.grid(row, column)`	Arrange in table form
`.place(x, y)`	Set position using coordinates

EVENTS / COMMANDS

```
def on_click():
    print("Button clicked")

button = tk.Button(root, text="Click", command=on_click)
button.pack()
```

STYLING WIDGETS

```
label = tk.Label(root, text="Hi",
                 fg="blue",      # text color
                 bg="yellow",    # background color
                 font=("Arial", 14))
```

GETTING / SETTING TEXT

```
entry = tk.Entry(root)
entry.get()              # Get text
entry.insert(0, "Hello") # Insert text
entry.delete(0, tk.END)  # Clear text
```

MESSAGE BOXES

```
from tkinter import messagebox
messagebox.showinfo("Title", "Your message here")
```