

## Topic 15: Virtual Environment & Tkinter

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### ◆ Virtual Environment

- Isolated Python environment to manage packages per project.
- Create with:

```
python -m venv env_name
```

- Activate:

```
# Windows
```

```
env_name\Scripts\activate
```

```
# Linux/Mac
```

```
source env_name/bin/activate
```

- Deactivate:

```
deactivate
```

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### ◆ Tkinter

**Definition:** Tkinter is Python's standard GUI library to create desktop applications.

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### ◆ Install Tkinter

```
# Usually comes with Python
```

```
# For missing:
```

```
pip install tk
```

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### ◆ Import Tkinter

```
import tkinter as tk
```

```
from tkinter import messagebox
```

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#### ◆ Basic Tkinter App

```
import tkinter as tk

root = tk.Tk()
root.title("My App")
root.geometry("300x200")

label = tk.Label(root, text="Hello Tkinter!")
label.pack()

button = tk.Button(root, text="Click Me", command=lambda: print("Button Clicked"))
button.pack()

root.mainloop()
```

#### Explanation:

- Tk() → creates main window
  - Label → display text
  - Button → clickable button
  - pack() → display widgets
  - mainloop() → keeps window open
- 

#### ◆ Challenges

##### Solved Challenge 1: Display messagebox

```
import tkinter as tk

from tkinter import messagebox
```

```
root = tk.Tk()  
  
messagebox.showinfo("Title", "Hello World")  
  
root.mainloop()
```

### Solved Challenge 2: Button changes label text

```
import tkinter as tk
```

```
def change_text():  
  
    label.config(text="Text Changed!")
```

```
root = tk.Tk()  
  
label = tk.Label(root, text="Original")  
  
label.pack()  
  
button = tk.Button(root, text="Change", command=change_text)  
  
button.pack()  
  
root.mainloop()
```

### Your 18 Challenges:

1. Create window with title and size.
2. Add multiple labels.
3. Add multiple buttons with different actions.
4. Change label text using button click.
5. Add Entry widget and read input.
6. Display input from Entry in Label.
7. Create checkbox and print value.
8. Create radio buttons and print selection.
9. Create dropdown menu.
10. Add listbox and get selected item.

11. Use Frame widget to organize layout.
12. Add scrollbar to listbox.
13. Change button color on hover.
14. Add canvas and draw shapes.
15. Create multiple windows.
16. Close window on button click.
17. Add image in label.
18. Design simple calculator GUI.