🔥 30-Day Python Learning Plan

Here's your 🔥 **30-Day Python Roadmap** from **Basic to Advanced**, structured for step-by-step learning with practical exercises.

🚀 Week 1: Python Basics (Getting Started)

🗓️ Day 1: Introduction & Setup

- ✅ Install Python & Set up VS Code/Jupyter Notebook
- ✅ Learn how Python works (Syntax, Indentation)
- ✅ Print "Hello, World!" 🎉
- ✅ Basic input/output (print(), input())

🗓️ Day 2: Variables & Data Types

- ✅ Variables & Constants 🎯
- ✅ Basic Data Types (int, float, str, bool)
- ✅ Type conversion & String manipulation
- ✅ String formatting (f-strings, .format())

🗓️ Day 3: Operators & Expressions

- ✅ Arithmetic, Comparison & Logical operators 🧮
- ✅ Membership (in, not in) and Identity operators
- ✅ Operator precedence & associativity

🗓️ Day 4: Control Flow (Conditions)

- ✅ if, elif, else statements 🤔
- ✅ Nested conditions
- ✅ Short-circuiting in conditions

🗓️ Day 5: Loops (Iteration) 🔁

- ✅ for and while loops
- ✅ Loop control statements (break, continue, pass)
- ✅ Nested loops & range()

🗓️ Day 6: Functions & Scope 🔥

- ✅ Defining functions using def
- ✅ Parameters, return values & default arguments
- ✅ Local vs Global variables
- ✅ Recursion basics

🗓️ Day 7: Practice & Mini Project 🏆

- 🔹 Solve 5 beginner-level coding problems (e.g., Fibonacci, Factorial)
- 🔹 **Mini Project:** Basic Calculator

🚀 Week 2: Data Structures & File Handling

🗓️ Day 8: Lists & Tuples

- ✅ Lists (append(), remove(), slicing)
- ✅ List comprehensions & iteration
- ✅ Tuples (Immutable lists)

🗓️ Day 9: Dictionaries & Sets

- ✅ Key-Value pairs (dict) 🔑
- ✅ Dictionary methods (keys(), values(), items())
- ✅ Sets & set operations (union, intersection)

🗓️ Day 10: Strings & Advanced String Operations

- ✅ String slicing & methods (strip(), split(), join())
- ✅ Regular Expressions (re module)

🗓️ Day 11: File Handling 📂

- ✅ Reading/Writing files (open(), read(), write())
- ✅ Working with CSV & JSON files

🗓️ Day 12: Exception Handling ⚠️

- ✅ try-except blocks
- ✅ Handling multiple exceptions
- ✅ Using finally and else

🗓️ Day 13: Advanced Functions 🛠️

- ✅ Lambda functions
- ✅ map(), filter(), reduce()
- ✅ Decorators & closures

🗓️ Day 14: Practice & Mini Project 🎯

- 🔹 Solve 5 intermediate-level problems
- 🔹 **Mini Project:** To-Do List App

🚀 Week 3: Object-Oriented Programming (OOP) & Modules

🗓️ Day 15: Introduction to OOP 🎭

- ✅ Classes & Objects (__init__, self)
- ✅ Attributes & Methods

🗓️ Day 16: OOP Advanced (Inheritance & Polymorphism)

- ✅ Inheritance (super()) & method overriding
- ✅ Polymorphism & method overloading

🗓️ Day 17: Special Methods & Encapsulation 🔐

- ✅ __str__, __repr__, __len__
- ✅ Private & protected members

🗓️ Day 18: Modules & Packages 📦

- ✅ Importing modules (import, from ... import)
- ✅ Creating custom modules
- ✅ Virtual environments (venv)

🗓️ Day 19: Working with APIs 🌐

- ✅ Sending HTTP requests (requests module)
- ✅ Consuming REST APIs (JSON handling)

🗓️ Day 20: Database Handling 🗄️

- ✅ Working with SQLite/MySQL (sqlite3, pymysql)
- ✅ CRUD operations (Create, Read, Update, Delete)

🗓️ Day 21: Practice & Mini Project 🎯

- 🔹 Solve 5 advanced problems
- 🔹 **Mini Project:** Weather App using an API

🚀 Week 4: Advanced Topics & Real-World Applications

🗓️ Day 22: Web Scraping 🕸️

- ✅ BeautifulSoup & requests for scraping
- ✅ Scraping tables & saving data to CSV

🗓️ Day 23: GUI Development 🎨

- ✅ Tkinter or PyQt for building simple GUI apps

🗓️ Day 24: Data Science Basics 📊

✅ Introduction to NumPy, Pandas, and Matplotlib

🗓️ Day 25: Automation with Python 🤖

✅ Using selenium for browser automation
✅ Automating tasks with schedule module

🗓️ Day 26: Introduction to Machine Learning 🤖

✅ Basics of scikit-learn
✅ Training a simple ML model

🗓️ Day 27: Multi-threading & Performance Optimization ⚡

✅ Using threading and multiprocessing
✅ Optimizing loops & functions

🗓️ Day 28: Mini Project - Portfolio Website 🌐

🔹 Build a basic portfolio website using **Flask/Django**

🗓️ Day 29: Capstone Project 🎯

🔹 **Build a Complete Python Project**
(Choose between a web scraper, automation tool, or API-based project)

🗓️ Day 30: Final Review & Next Steps 🚀

✅ Revise all topics
✅ Practice **DSA in Python** on platforms like LeetCode
✅ Explore advanced areas (AI, Web Dev, DevOps)

🔥 After 30 Days 🔥

✅ Start solving **Python-based DSA** problems
✅ Work on **real-world projects**
✅ Learn **Advanced Python topics** (Django, ML, etc.)

🔗 **Connect with Me**

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