Python Learning Roadmap

Beginner Level

- 1. Python Basics: Installing Python, IDEs, Running Scripts, Variables, Data Types, Type Casting

- 2. Operators: Arithmetic, Comparison, Logical, Bitwise, Assignment, Membership, Identity

- 3. Control Flow: if, elif, else, while and for loops, break, continue, pass

- 4. Data Structures: Strings, Lists, Tuples, Sets, Dictionaries

- 5. Functions: Defining, Parameters, Return values, *args, **kwargs, Lambda, Recursion

- 6. Basic Projects: Calculator, To-Do List, Number Guessing Game, Simple Quiz App

Intermediate Level

- 7. Object-Oriented Programming (OOP): Classes, Objects, Inheritance, Polymorphism, Encapsulation, Abstraction

- 8. File Handling: Reading, Writing, Context Manager, CSV, JSON

- 9. Error Handling: try, except, else, finally, Common and Custom Exceptions

- 10. Modules and Packages: import, __name__ == '__main__', Built-in and Custom Modules

- 11. Decorators and Generators: Function decorators, yield, next(), iter()

- 12. Intermediate Projects: Contact Book CLI, Expense Tracker, File Organizer, Student Grade Tracker

Advanced Level

- 13. Advanced OOP: Multiple Inheritance, MRO, Abstract Base Classes

- 14. Iterators & Generators: Custom iterators, Generator expressions

- 15. Functional Programming: map(), filter(), reduce(), zip(), enumerate(), functools, itertools

- 16. Concurrency: Threading, Multiprocessing, Asyncio

- 17. Database Handling: sqlite3, MySQL/PostgreSQL, ORM (SQLAlchemy)

- 18. Testing and Debugging: assert, unittest, pytest, logging

- 19. Popular Libraries: NumPy, Pandas, Matplotlib, Requests, BeautifulSoup, Flask, Django,

OpenCV, PyGame

- 20. Advanced Projects: Blog Website, Weather App, Chat App, Automation scripts, Data Analysis

Dashboard

Mastery & Real-World Practice

- 21. Version Control: Git & GitHub, Branches, Pull requests

- 22. Virtual Environments: venv, pip, requirements.txt, Packaging

- 23. Deployment: Hosting on Heroku/Render, PyInstaller for executables

- 24. Interview Preparation: DSA practice, Python-specific interview questions