**Python and C++ Learning Roadmap**

**Python Roadmap**   
**Beginner**  
- Syntax and Basics: Variables, data types, operators, input/output, comments- Control Flow: If-else, loops (for, while)  
- Data Structures: Lists, Tuples, Dictionaries, Sets  
- Functions: def, return, \*args, \*\*kwargs  
- Error Handling: try, except, finally   
**Intermediate**  
- OOP: Classes and Objects, Inheritance, Polymorphism  
- File Handling: Read/write, CSV/JSON  
- Modules & Packages: Import, create your own  
- Comprehensions: List, dict, set  
- Decorators & Generators   
**Advanced**  
- Lambda, map, filter, reduce  
- Regular Expressions  
- Multithreading & Multiprocessing  
- Memory Management, Garbage Collection  
- Virtual Environments & Packaging  
- Type Hinting  
- Unit Testing (unittest, pytest)   
**Expert / Real-World**  
- Frameworks: Flask, Django, Pandas, NumPy, TensorFlow  
- APIs and Web Scraping: requests, BeautifulSoup, Selenium  
- Databases: SQLite, PostgreSQL

- Design Patterns  
- Project Ideas: Chatbot, REST API, Automation tools

**C++ Roadmap**   
**Beginner**  
- Syntax and Basics: Data types, input/output, operators  
- Control Structures: if-else, switch, loops  
- Functions: Pass-by-value/reference  
- Arrays and Strings  
- Pointers: Basics, arithmetic, NULL   
**Intermediate**  
- OOP: Classes, Constructors, Inheritance, Operator Overloading- Memory Management: new/delete, smart pointers  
- File I/O  
- STL: Vectors, Maps, Sets, Algorithms   
**Advanced**  
- Templates: Function and class  
- Exception Handling  
- Multithreading: Threads, Mutex  
- Lambda Functions  
- Move Semantics (C++11)  
- CMake & Build Systems   
**Expert / Real-World**  
- Design Patterns  
- Networking (Sockets)  
- Libraries: Boost, OpenCV, SFML  
- System Programming

- Competitive Programming  
- Project Ideas: Game engine, Compiler, Database