



# Python Learning Checklist: Beginner to Advanced

Here is a comprehensive checklist of Python topics to guide your learning journey. You can tick off each item as you master it.

## Beginner Level

- ☐ Python Installation and Setup
- ☐ Basic Syntax and Indentation
- ☐ Variables and Data Types (int, float, str, bool)
- ☐ Basic Input and Output
- ☐ Operators (Arithmetic, Comparison, Logical, Assignment)
- ☐ Conditional Statements (if, elif, else)
- ☐ Loops (for, while)
- ☐ Functions: Definition, Arguments, Return Values
- ☐ Basic Data Structures: Lists, Tuples, Dictionaries, Sets
- ☐ List Comprehensions
- ☐ String Handling and Methods
- ☐ File Input/Output Basics
- ☐ Exception Handling (try, except)

## Intermediate Level

- ☐ Modules and Packages
- ☐ Standard Library modules (e.g., math, datetime, os, sys)
- ☐ More on Functions (Default Arguments, Variable-length Arguments, Lambda functions)
- ☐ Object-Oriented Programming (Classes, Objects, Inheritance, Encapsulation)
- ☐ Iterators and Generators
- ☐ Decorators
- ☐ Context Managers (with statement)
- ☐ Regular Expressions
- ☐ Working with JSON and CSV

- ☐ Virtual Environments and Package Management (pip)
- ☐ Debugging and Logging

## Advanced Level

- ☐ Advanced OOP Concepts (Multiple Inheritance, Abstract Classes, Metaclasses)
- ☐ Functional Programming (map, filter, reduce)
- ☐ Multithreading and Multiprocessing
- ☐ Asynchronous Programming (asyncio, await)
- ☐ Memory Management and Garbage Collection
- ☐ Design Patterns in Python
- ☐ Testing (unittest, pytest)
- ☐ Python C Extensions and Integration
- ☐ Packaging and Distribution (setup.py, wheel)
- ☐ Performance Optimization (Profiling, Cython)
- ☐ Working with Databases (SQLAlchemy, SQLite, PostgreSQL)
- ☐ Network Programming (Sockets, HTTP Requests)
- ☐ Web Development Frameworks (Django, Flask)
- ☐ Data Science Libraries (NumPy, Pandas, Matplotlib)

This checklist covers most of what you'll want to know to become fluent in Python. Feel free to ask for explanations or resources on any specific topic!