A-Z Roadmap to Learn Python for Data Science, ML & Software Engineering

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Topic Names

- Basic Syntax and Structure
- Control Flow
- Functions
- Data Structures & Algorithms
- Modules and Packages
- File Handling
- Error Handling
- Object-Oriented Programming (OOP)
- Working with Data
- Advanced Concepts
- Libraries and Frameworks
- Testing and Debugging
- Version Control
- Best Practices

1. Basic Syntax and Structure:

- Variables and Data Types
- Operators (arithmetic, comparison, logical, etc.)
- Comments and Docstrings

2. Control Flow:

- Conditional Statements (if, elif, else)
- Loops (for, while)
- Loop Control (break, continue, pass)

3. Functions:

- Defining and Calling Functions
- Arguments and Parameters
- Return Values
- Lambda Functions
- Scope (local, global)

4. Data Structures & Algorithm:

- Lists
- Tuples
- Dictionaries
- Sets
- List Comprehensions
- Dictionary Comprehensions
- Time Complexity
- Space Complexity
- Sorting algorithms
- Linked list
- Stack
- Queue

5. Modules and Packages:

- Importing Modules
- Standard Library Modules
- Installing and Using Third-Party Packages (pip)

6. File Handling:

- Reading and Writing Files
- Working with File Paths

7. Error Handling:

- Exceptions (try, except, finally)
- Raising Exceptions
- Custom Exceptions

8. Object-Oriented Programming (OOP):

- Classes and Objects
- Methods and Attributes
- Inheritance
- Polymorphism
- Encapsulation

9. Working with Data:

- Strings (manipulation and formatting)
- Regular Expressions
- Dates and Times

10. Advanced Concepts:

- Decorators
- Generators and Iterators
- Context Managers
- Metaclasses

11. Libraries and Frameworks:

- Common Libraries (e.g., NumPy, pandas, matplotlib)
- Web Development (Flask, Django)
- Web Scraping (BeautifulSoup, Selenium, Scrapy)
- Data Science and Machine Learning (scikit-learn, TensorFlow, PyTorch)

12. Testing and Debugging:

- Writing Tests (unittest, pytest)
- Debugging Tools and Techniques

13. Version Control:

- Using Git for Version Control

14. Best Practices:

- Code Style (PEP 8)
- Writing Clean and Readable Code
- Documentation

Learning Resources Links:

- Official Docs: Visit
- Become a Python Developer: Visit
- 60 Days of Python: Visit