

Python Programming

Python Fundamentals

- Introduction to Python
 - Variables & Data Types
 - Type Casting
 - Input & Output Operations
 - Operators in Python
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Control Flow Statements

- if, elif, else Statements
 - for & while Loops
 - break, continue, pass
 - Nested Loops
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Functions in Python

- Defining Functions
 - Function Arguments & Parameters
 - Return Statements
 - Lambda Functions
 - Recursion
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Data Structures

- Lists
- Tuples
- Sets
- Dictionaries
- List Comprehensions

Strings & Regular Expressions

- String Operations & Methods
- String Formatting
- Regular Expressions (Regex)
- Pattern Matching

File Handling

- Reading & Writing Files
- Working with Text Files
- CSV & JSON Handling
- File Management

Exception Handling

- try, except, finally
- Custom Exceptions
- Debugging Techniques
- Logging Basics

Object-Oriented Programming (OOP)

- Classes & Objects
- Constructors (**init**)
- Inheritance
- Polymorphism
- Encapsulation & Abstraction

Modules & Packages

- Importing Modules

- Creating Custom Modules
 - Python Standard Libraries
 - Package Management
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Advanced Python Concepts

- List, Set & Dictionary Comprehensions
 - Iterators & Generators
 - Decorators
 - Closures
 - Context Managers
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Functional Programming

- map(), filter(), reduce()
 - Lambda Expressions
 - Higher-order Functions
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Multithreading & Multiprocessing

- Threading Basics
 - Multiprocessing
 - Parallel Execution
 - Async Programming Basics
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APIs & Web Scraping

- Working with REST APIs
 - API Requests using requests
 - Web Scraping with BeautifulSoup
 - Data Extraction Techniques
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Database Connectivity

- MySQL with Python
 - SQLite Basics
 - CRUD Operations
 - Database Integration
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Python for Data Handling

- NumPy Basics
 - Pandas DataFrames
 - Data Cleaning & Analysis
 - Data Visualization Basics
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Web Development with Python

- Flask Basics
 - REST API Development
 - Backend Fundamentals
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Introduction to AI & Automation

- Automation Scripts
 - Intro to Machine Learning
 - Python for AI Applications
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Testing & Best Practices

- Unit Testing Basics
 - Code Optimization
 - Debugging & Error Handling
 - Writing Clean Python Code
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Real-world Projects

- Student Management System
 - Web Scraping Project
 - REST API Application
 - Automation Tool
 - Data Analysis Project
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Career Preparation

- Python Interview Questions
 - Problem-solving Practice
 - GitHub Portfolio Development
 - Resume Building
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Tools Covered

- Python
- Visual Studio Code
- PyCharm
- Jupyter Notebook
- Google Colab
- MySQL
- Flask
- Git
- GitHub
- NumPy
- Pandas