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Python Programming Languages

Syllabus

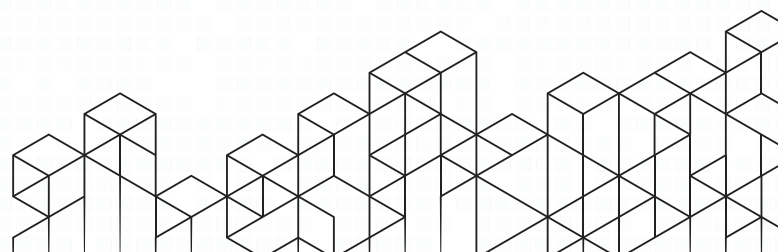
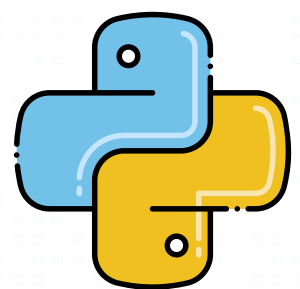
Beginner Level

Chapter 1: Introduction to Python Programming

- Overview of Python: history, features, and applications
- Setting up the development environment: installing Python, choosing an IDE (e.g., PyCharm, Jupyter Notebook...etc)
- Python syntax basics: variables, basics of Python, Print Statements, Comments, Multiline Statement, Multiple Assignments,
- Writing and executing Python scripts: using IDLE, running scripts from the terminal
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications
- Setting up the development environment: installing Python, choosing an IDE (e.g., PyCharm, Jupyter Notebook...etc)

Chapter 2: Data Structures / Types

- Numeric Types: (int, float)
- String Type: (" ", ' ')
- Boolean Type: True or False
- Sequence Types: (list, tuple, range)
- Mapping Type: (dictionary)
- Set Types: (set, frozenset)
- Type Casting in Python
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications



Chapter 3: Types of Operators

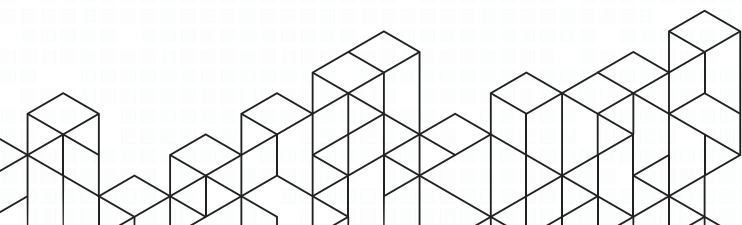
- Arithmetic Operators
- Comparison Operators
- Assignment Operators
- Bitwise Operators
- Logical Operators
- Membership Operators
- Identity Operators
- Set Operators
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 4: Conditional statements

- While Loops
- For Loops
- Nested Loops
- Looping Through Dictionaries
- Looping Techniques (enumerate (), zip ())
- Loop Control Statements
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 6: Built-in Functions

- Input/Output Functions
- Number / Mathematical Functions
- String Functions
- List Functions
- Tuple Functions
- Dictionary Functions
- Date and Time Functions
- Miscellaneous Functions (Map, Reduce, Filter)
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications



Chapter 7: Modules and Packages

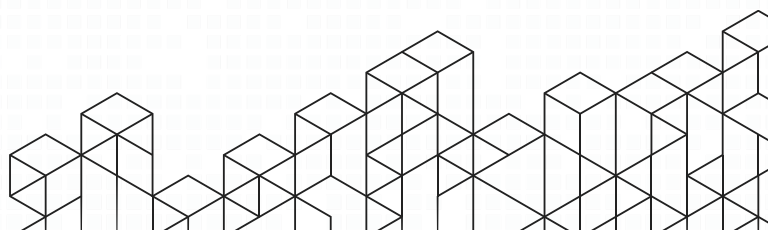
- Understanding modules and importing standard library modules
- Creating and using custom modules
- Introduction to third-party libraries: installation, basic usage
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 8: File Handling

- Working with files (open, close)
- Different file modes read mode ('r'), write mode ('w'), append mode ('a')
- Using context managers (with statement) to automatically close files
- Working with different files (Text, CSV, Excel, JSON, Binary Files)
- Methods to manipulate files and directories Using OS module.
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 9: User Define Function

- Function Definition and Calling
- Function Arguments
 - Positional arguments
 - Keyword arguments
 - Default argument
 - Variable length arguments
 - Difference between *args, **kwargs
- Scope of Variable (local and global)
- Anonymous Functions (Lambda Functions)
- First Class functions
- Function Decorators
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications



Chapter 10: Exception Handling

- Basic Exception Handling (Using try, except, else, and finally blocks)
- Built-in Exceptions
- User-defined Exceptions
- Raising an Exceptions
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

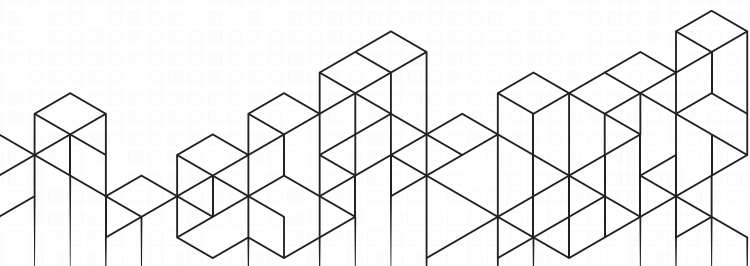
Advanced Level

Chapter 11: Regular Expressions

- Syntax and Basic Operations: Learn the basics like metacharacters, character classes, quantifiers, anchors, and alternation.
- Advanced Matching Techniques: Explore advanced techniques like lookahead/lookbehind assertions, backreferences, and non-greedy quantifiers.
- Modifiers and Flags: Understand modifiers for case-insensitive matching, multiline mode, and global matching.
- Optimization: Optimize regex for performance by minimizing backtracking and unnecessary capturing groups.
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 12: GUI development using Tkinter

- Widgets: Learn about buttons, labels, entry fields, etc.
- Layout: Understand pack(), grid(), and place().
- Events: Handle user interactions like clicks and key presses.
- Customization: Style widgets for better appearance.
- Dialogs: Create message boxes and file dialogs.
- Menus: Build menus and toolbars for navigation.
- Architecture: Organize code effectively for maintainability.
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications



Chapter 13: Data Visualization / Plotting Graph

- Introduction to Data Visualization
- Matplotlib Basics
 - Creating line plots and scatter plots.
 - Customization: Adding titles, labels, and styling plots.
 - Common Plot Types: Bar charts, histograms, and pie charts.
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 14: Object-Oriented Programming (OOP) Basics

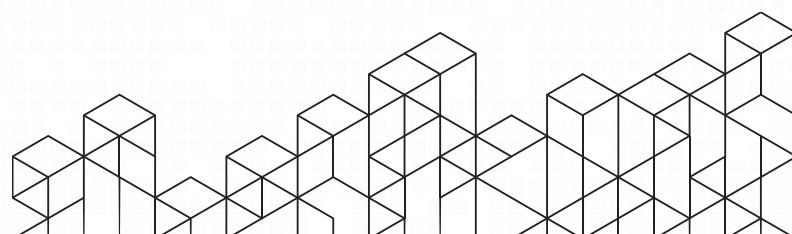
- Introduction to OOP concepts:
- classes, objects, methods
- Encapsulation, inheritance, polymorphism
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 15: Database Connection

- Introduction to databases
- Installing Libraries for connectivity
- Database Connectivity
- CRUD Operation in SQL
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 16: Web Development with Django

- Introduction to Django: MVC architecture, ORM
- Building a more complex web application: user authentication, permissions
- CRUD Operation using Django
- Deploying Django applications
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications



Chapter 17: Data Analysis with Pandas

- Introduction to Pandas: Series, DataFrame
- Data manipulation: filtering, sorting, aggregating.
- Working on Excel / csv files Using Pandas
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 18: Miscellaneous Topics

- Comprehensions
- Collections
- APIs
- Practice: Hands-on exercises covering all the covered topics and Review of key concepts and practical applications

Chapter 19: Interview and Resume Preparation

- Mock Interview Practice
- Resume Preparation



Certification after Completion



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