

Python - Programming

1. Introduction to Python

- History and features of Python
- Installing Python (IDLE, Jupyter, VS Code, etc.)
- Writing and running your first Python script
- Python interpreter and interactive mode

2. Python Basics

- Keywords, identifiers, comments
- Variables and data types
- Input and output (`input()`, `print()`)
- Type conversion and casting

3. Operators and Expressions

- Arithmetic operators
- Comparison operators
- Logical operators
- Assignment operators
- Membership and identity operators

4. Control Flow Statements

- Conditional statements: `if`, `if-else`, `if-elif-else`
- Loops: `while`, `for`
- Loop control: `break`, `continue`, `pass`

5. Data Structures in Python

- **Strings:** indexing, slicing, string methods
- **Lists:** creation, indexing, slicing, list methods

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- **Tuples:** immutable sequences
- **Dictionaries:** key-value pairs
- **Sets:** unique unordered data

6. Functions

- Defining and calling functions
- Arguments and return values
- Default, keyword, and variable-length arguments
- Lambda functions
- Recursion

7. Modules and Packages

- Importing modules
- Built-in modules (e.g., math, random, datetime)
- Creating and using user-defined modules

8. File Handling

- Opening and closing files
- Reading and writing text files
- File methods (`read()`, `readline()`, `write()`, `writelines()`)
- Working with CSV files (*optional*)

9. Exception Handling

- Types of errors: Syntax vs Runtime
 - try, except blocks
 - finally and else blocks
 - Raising exceptions
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10. Object-Oriented Programming (OOP)

- Classes and objects
- Constructors (`__init__`)
- `self` keyword
- Inheritance and method overriding
- Encapsulation and polymorphism (*basic concepts*)

11. Basic Python Libraries (Optional)

- `math`
- `random`
- `datetime`
- `os`
- `sys`

12. Mini Projects / Assignments

- Calculator app
- Quiz game
- To-do list
- Number guessing game