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Programming with Python

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Outline

- Installing Python
- Python IDEs and interpreter
- Basic syntax
- Editing, saving and running scripts
- Importing Modules.

Describing Programming language

What is computer programming?

- is the process of designing and building executable computer software to accomplish a specific task.

Key components of computer programming include:

1. **Languages**: Programming languages (like C, Python, Java, C++, etc.) provide the syntax and semantics for writing code.

2. **Algorithms**: These are step-by-step procedures or formulas for solving a problem or performing a task.

3. **Logic**: Programming requires logical thinking and problem-solving skills to develop efficient solutions.

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What is Python?

- High-level, interpreted programming language
- Created by Guido van Rossum in 1991
- Known for readability and simplicity
- Widely used in web development, Data Science, automation, AI, etc.

Installing Python

Steps to Install Python:

- Visit the official website: https://python.org
- Download the latest version compatible with your OS (Windows, macOS, Linux)
- Run the installer:
  - Windows: Check "Add Python to PATH" checkbox
  - macOS/Linux: Use package managers or compile from source
- Verify installation:
  - Open Command Prompt / Terminal
  - Type python --version or python3 --version

Python IDEs and Interpreters

What is an IDE?

- An Integrated Development Environment simplifies coding with features like code completion, debugging, and syntax highlighting.

Popular Python IDEs:

- IDLE, PyCharm, VS Code, Jupyter Notebook, etc.

Python Interpreter:

- Executes Python code
- Can be accessed via command line (python or python3)
- IDEs embed interpreters for easier coding

Basic Syntax of Python

Indentation:

- Uses indentation (spaces or tabs) to define code blocks
- Essential for syntax correctness

Comments:

- Single-line: # This is a comment
- Multi-line: Triple quotes ''' comment ''' or """ comment """

Variables & Data Types:

- Dynamic typing: no need to declare data types

Print statement:

- print("Hello, World!")

Editing, Saving, and Running Scripts

Creating a Script:

- Use an IDE or text editor (Notepad++, VS Code, Sublime Text)
- Save with .py extension, e.g., hello.py

Editing:

- Write or modify code in the editor

Running Scripts:

Command Line:

- Navigate to the script location
- Run: python hello.py or python3 hello.py

IDE:

- Use a run button or menu options

Importing Modules

What are Modules?

- Reusable pieces of code (functions, classes, variables)

Standard Modules:

- math: mathematical functions, random: generate random numbers, datetime: date and time operations

Importing Modules:

```
import math
print(math.sqrt(16))
```

Import Specific Functions:

```
from math import pi, sqrt
print(pi)
```