

PYTHON INTRODUCTION

What is Python?

Python is a high-level, interpreted programming language known for its clean and readable syntax. It's beginner-friendly and extremely popular across industries.

Real-World Use Cases of Python:

Python is everywhere! Here are some of the most popular areas where it's used:

1. Web Development — using frameworks like Django and Flask.
2. Data Science & Analytics — with tools like Pandas, NumPy, and Matplotlib.
3. Machine Learning & AI — with libraries like TensorFlow, PyTorch, and scikit-learn.
4. Automation & Scripting — writing scripts to automate repetitive tasks.
5. Game Development — using tools like Pygame.
6. APIs & Backend Services — quick prototyping and building RESTful APIs.
7. Cybersecurity — used in building tools for penetration testing and scanning.

Advantages of Python:

- ✓ Beginner-Friendly: Simple syntax, easy to learn
- ✓ Versatile: Works across multiple domains — from data to web to automation
- ✓ Large Community: Great support, tutorials, open-source packages
- ✓ Cross-Platform: Works on Windows, macOS, and Linux
- ✓ Extensive Libraries: Speeds up development with reusable code
- ✓ Great for Prototyping: Build functional apps faster

Disadvantages of Python:

Slower Execution Speed: Compared to compiled languages like C++

- ✗ Not Ideal for Mobile Development: Rarely used for native apps
- ✗ High Memory Usage: Can be inefficient for memory-critical tasks
- ✗ Runtime Errors: Being dynamically typed can lead to more runtime bugs
- ✗ Limited Threading: Due to the Global Interpreter Lock (GIL), Python's multithreading can be less efficient for CPU-bound tasks.