

NumPy Introduction

What is NumPy?

- NumPy stands for **Numerical Python**.
- It provides a powerful data structure called **N-Dimensional Array** (ndarray).
- It's extremely fast and memory-efficient compared to normal Python lists.

NumPy = **Super fast mathematical toolbox** for Python.

Why NumPy? (Advantages)

Feature	Benefit
Speed	50x to 100x faster than Python list
Memory Efficient	Stores data compactly
Better Math	Matrix operations, statistics
Foundation	Base for Pandas, TensorFlow, ML tools

Real World Usage:

- Machine Learning models
- Data analysis & statistics
- Finance calculations
- Image processing
- Scientific computing