

# 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