

# NumPy Basics

## 1. What is NumPy?

NumPy is a Python library used for numerical and scientific computing.

It provides support for arrays, matrices, and mathematical operations.

## 2. Why is NumPy faster than Python lists?

NumPy uses optimized C-based implementation and stores data in contiguous memory.

This makes computations faster and more efficient than Python lists.

## 3. What is an ndarray?

An ndarray is the main data structure of NumPy.

It is a multi-dimensional array that stores elements of the same data type.

## 4. Difference between array and list

A NumPy array stores elements of the same data type and supports fast mathematical operations.

A Python list can store different data types and is slower for numerical computations.

## 5. What is broadcasting?

Broadcasting is a NumPy feature that allows arithmetic operations on arrays of different shapes.

It automatically expands smaller arrays to match larger ones.