

# Python Libraries

1) Tensor Flow : Library for high performance numerical computation  
Data in Tensorflow are represented as tensors, which are multidimensional arrays.

## Features :

- 1) Tensor flow is majorly used in DL models, and neural networks where other libraries like torch but tensor flow has better computation graph visualizations.
- 2) In neural machine translation reduces error by 50 - 60 %.
- 3) parallel computing to execute complex models
- 4) seamless library management.

## Apps of Tensorflow :

- 1) Speech / Image recognition
- 2) Text based apps
- 3) Time series
- 4) Video detection

2) Numpy: Numerical python is the fundamental package for numerical computation, it contains a powerful n-dimensional array object.

### Features:

- 1) provides fast precompiled functions for numerical routines
- 2) Array oriented computing for better efficiency
- 3) Supports object-oriented approach
- 4) compact & faster computations with vectorizations

### Apps of numpy:

- 1) Extensively used in data analysis
- 2) creating powerful N-dimensional array
- 3) forms the base of other libraries like Scipy, Scikit learn
- 4) replacement of matlab when used with Scipy, matplotlib.

3) Scipy: Scientific python provides many user-friendly and efficient routines for scientific computation it extends numpy.

### Features:

- 1) A collection of mathematical algorithms and scientific functions built on the numpy extension of python
- 2) High-level commands and classes for manipulating and visualizing data.
- 3) Multi-Dimensional image processing with `scipy.ndimage`.
- 4) Includes functions for computing integrals numerically, solving differential equations, optimization, etc

### Apps of Scipy:

- 1) Multi dimensional image operations
- 2) Solving differential equations and fourier transform
- 3) Optimization algorithms
- 4) Linear algebra

4) Pandas: Pandas provides fast, flexible and expressive data structures designed to work with structured data easily and intuitively.

### Features:

- 1) Eloquent syntax and rich functionality
- 2) Apply() enables you to run a function across a series of data
- 3) High-level abstraction.
- 4) contains high-level data structures and manipulation tools.

### Apps of pandas :

- 1) General data wrangling
- 2) ETL jobs and data storage.
- 3) used in wide variety of academic and commercial domains , including stats etc .
- 4) Time Series- Specific functionality

5.) Matplotlib: It is a plotting library for python which used for data visualization. it also provides an object-oriented API for embedding plots into applications

### Features:

- 1) As usable as matlab with an advantage of being free and open-source
- 2.) supports dozens of backends and output types
- 3) Pandas itself can be used as wrappers around matplotlib's API
- 4) smaller memory consumption and Better runtime behaviour.

### Apps of Matplotlib:

- 1) correlation analysis of variables
- 2) visualize 95% confidence Intervals of ml models
- 3) outlier detection
- 4) visualizing distributions to gain instant big insights.