LIBRARIES IN PYTHON

**TENSOR FLOW-**This library was developed by Google in collaboration with Brain Team. TensorFlow is a part of almost every Google application for machine learning.TensorFlow works like a computational library for writing new algorithms that involve a large number of tensor operations, since neural networks can be easily expressed as computational graphs they can be implemented using TensorFlow as a series of operations on Tensors. Plus, tensors are N-dimensional matrices which represent your data.

**Features of TensorFlow**

**1. Responsive Construct**-With TensorFlow, we can easily visualize each and every part of the graph which is not an option while using Numpy or SciKit.

**2. Flexible-**One of the very important Tensorflow Features is that it is flexible in its operability, meaning it has modularity and the parts of it which you want to make standalone, it offers you that option.

**3. Easily Trainable**-It is easily trainable on CPU as well as GPU for distributed computing.

**4. Parallel Neural Network Training**-TensorFlow offers pipelining in the sense that you can train multiple neural networksand multiple GPUs which makes the models very efficient on large-scale systems.

**5. Large Community-**Needless to say, if it has been developed by Google, there already is a large team of software engineers who work on stability improvements continuously.

**6. Open Source**-The best thing about this machine learning library is that it is open source so anyone can use it as long as they have internet connectivity.

**2-NUMPY-**Numpy is considered as one of the most popular machine learning library in Python.TensorFlow and other libraries uses Numpy internally for performing multiple operations on Tensors. Array interface is the best and the most important feature of Numpy.

## ****Features Of Numpy****

1. **Interactive:** Numpy is very interactive and easy to use.
2. **Mathematics:** Makes complex mathematical implementations very simple.
3. **Intuitive:** Makes coding real easy and grasping the concepts is easy.
4. **Lot of Interaction:** Widely used, hence a lot of open source contribution.

## 3-Scikit-Learn-It is a Python library is associated with NumPy and SciPy. It is considered as one of the best libraries for working with complex data.There are a lot of changes being made in this library. One modification is the cross-validation feature, providing the ability to use more than one metric. Lots of training methods like logistics regression and nearest neighbors have received some little improvements.

**Features Of Scikit-Learn**

**1. Cross-validation:** There are various methods to check the accuracy of supervised models on unseen data.

**2. Unsupervised learning algorithms:** Again there is a large spread of algorithms in the offering – starting from clustering, factor analysis, principal component analysis to unsupervised neural networks.

**3. Feature extraction:** Useful for extracting features from images and text (e.g. Bag of words)

### 4- Pandas- Pandas is a must for data-science. It provides fast, expressive, and flexible data structures to easily (and intuitively) work with structured (tabular, multidimensional, potentially heterogeneous) and time-series data.

## ****Features Of Pandas****

## Pandas make sure that the entire process of manipulating data will be easier. Support for operations such as Re-indexing, Iteration, Sorting, Aggregations, Concatenations and Visualizations are among the feature highlights of Pandas.

5- **Matplotlib** –It is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter.

6- **4. Keras**-Keras is considered as one of the coolest machine learning libraries in Python. It provides an easier mechanism to express neural networks. Keras also provides some of the best utilities for compiling models, processing data-sets, visualization of graphs, and much more.

**Features Of Keras**

* It runs smoothly on both CPU and GPU.
* Keras supports almost all the models of a neural network – fully connected, convolutional, pooling, recurrent, embedding, etc. Furthermore, these models can be combined to build more complex models.
* Keras, being modular in nature,  is incredibly expressive, flexible, and apt for innovative research.
* Keras is a completely Python-based framework, which makes it easy to debug and explore.

**STEPS TO INSTALL A LIBRARY**

* pip is the preferred installer program. Starting with Python 3.4, it is included by default with the Python binary installers.
* A virtual environment is a semi-isolated Python environment that allows packages to be installed for use by a particular application, rather than being installed system wide.
* venv is the standard tool for creating virtual environments, and has been part of Python since Python 3.3. Starting with Python 3.4, it defaults to installing pip into all created virtual environments.
* virtualenv is a third party alternative (and predecessor) to venv. It allows virtual environments to be used on versions of Python prior to 3.4, which either don’t provide venv at all, or aren’t able to automatically install pip into created environments.

**pip install package name**

**python -m pip install SomePackage**

**python -m pip install --upgrade SomePackage**