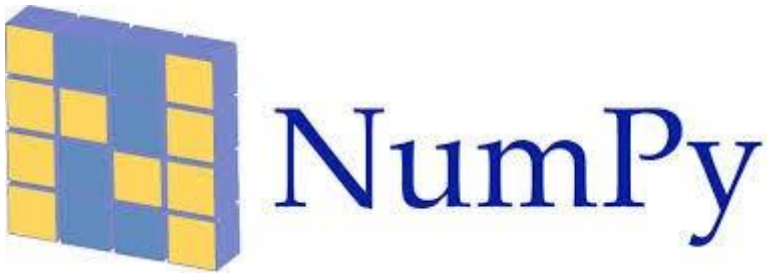
NumPy is the fundamental package for scientific computing with Python. It contains among other things:

- a powerful N-dimensional array object
- sophisticated (broadcasting) functions
- tools for integrating C/C++ and Fortran code
- useful linear algebra, Fourier transform, and random number capabilities

Besides its obvious scientific uses, NumPy can also be used as an efficient multi-dimensional container of generic data. Arbitrary data-types can be defined. This allows NumPy to seamlessly and speedily integrate with a wide variety of databases.



Pygame is a cross-platform set of Python modules designed for writing video games. It includes computer graphics and sound libraries designed to be used with the Python programming language built on top of the SDL library. Like SDL, pygame is highly portable and runs on nearly every platform and operating system.

Applications using pygame can run on Android phones and tablets with the use of Pygame Subset for Android (pgs4a). Sound, vibration, keyboard, and accelerometer are supported on Android.

Some games created with it:

-Frets on fire

-Void infinity

-Allefant 5

-Subterrex

-The Forest (a *Girls Who Code* project)

TensorFlow (commonly known as TF) is a library for manipulation of tensors (generic form of matrices) TensorFlow optimizes the processing of this type of data and can use both the CPU and the GPU for such computations.

Since these computations are a lot in the fields of Machine Learning and Neural Networks specifically, TensorFlow has become very popular in these fields and is used everywhere in building networks for commercial purposes as well as for research.

TensorFlow was and still is developed at Google as an open-source project (you can get access to the source code and modify and adapt it to your needs.) TensorFlow is still used at Google for development and research.

Pyglet is a library for the Python programming language that provides an object-oriented application programming interface for the creation of games and other multimedia applications. Pyglet runs on Microsoft Windows, Mac OS X, and Linux; it is released under BSD Licence.

It supports windowed and fullscreen operations as well as multiple monitors. Images, video, sound files, windowing, joysticks, user interface event handling.

Some of the features of pyglet are:

- No external dependencies or installation requirements. For most application and game requirements, *pyglet* needs nothing else besides Python
- Take advantage of multiple windows and multi-monitor desktops.
- Load images, sound, music and video in almost any format
- pyglet is written entirely in pure Python, and has excellent performance thanks to advanced batching for drawing thousands of sprites or animations.

Pillow is the successor of a previous library called PIL (Python Imaging Library.) *Pillow* is a library that specializes in drawing images. The library can be very useful for automated image processing, such as astrophotography photos which always need processing.

Pillow offers several standard procedures for image manipulation. These include:

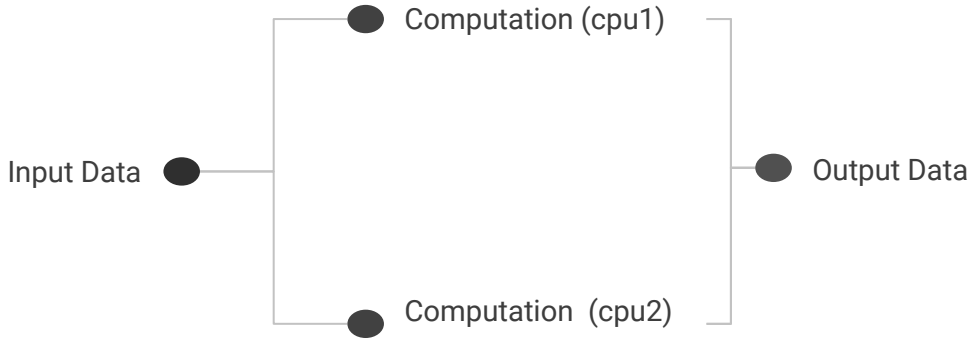
- per-pixel manipulations,
- masking and transparency handling,
- image filtering, such as blurring, contouring, smoothing, or edge finding,
- image enhancing, such as sharpening, adjusting brightness, contrast or color,
- adding text to images and much more.*

**Credit for this part: Wikipedia Contributors – CC-BY-SA)*

Multiprocess

Although Python is a high-level language, intensive data manipulation can still be done with it. Massive data requires the use of all the existing computing power which means that you will need to do *multiprocessing.* Python provides you with a library for just that: **multiprocessing** or **multiprocess** (they are two similar libraries.)

Multiprocessing allows you to do parallelization of your programs so that they can run faster than otherwise. The library allows you to jump-start yourself into the field of fast computation, parallel computation in an easy, high-level language like Python.



As the name implies, ***scikit-learn*** is a library intended for Machine Learning applications. In comparison to TensorFlow, it is much easier to work with. *scikit-learn* has many machine learning algorithms and using them is generally trivial after they are understood theoretically, and only requires determining the specific parameters or ‘settings’ for each algorithm.

Some of the algorithms implemented inside of *scikit-learn* are:

- Linear Regression
- Logistic regression
- Support Vector Machines
- K-means clustering
- Random Forests

One of the most famous libraries for plotting in Python, **matplotlib** provides easy and intuitive tools to plot data on a graph, 2D or 3D and can plot diagrams like pie charts and others. *matplotlib* can also draw figures from a list of pixels. Although it's not intended for that, it can be quite useful.

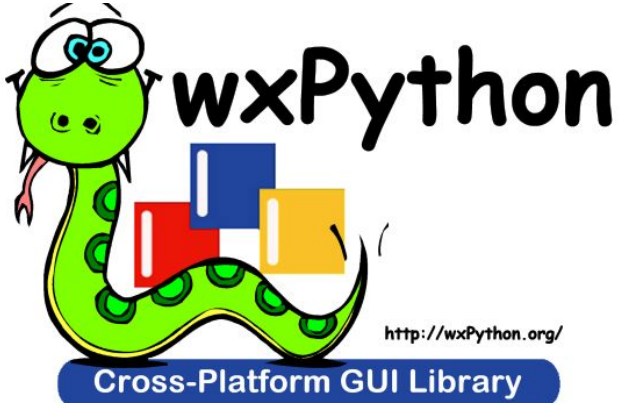
In machine learning applications, plotting data is essential as machine learning is more of a science than an engineering field and requires tinkering and watching the results. *Matplotlib* can satisfy almost all your needs in this regards. Plotting images you want your model to recognize, plotting the accuracy of your model while it's learning, etc…

Pandas is an open source, BSD-licensed library providing high-performance, flexible and easy-to-use data structures and data analysis tools. It is well known for its DataFrame object for data manipulation with integrated indexing, but it also has a lot of other useful features such as:

- Label-based slicing, fancy indexing, and subsetting of large data sets.
- Data structure column insertion and deletion.
- Reshaping and pivoting of data sets.
- Tools for reading and writing data between in-memory data structures and different file formats.
- Time series-functionality: Date range generation and frequency conversion, moving window statistics, moving window linear regressions, date shifting and lagging.

The name is derived from the term "panel data", an econometrics term for data sets that include observations over multiple time periods for the same individuals.

wxPython is an open-source, cross-platform GUI toolkit. It allows Python programmers to create programs with a robust, highly functional graphical user interface, simply and easily.



wxPython is a **cross-platform** toolkit. This means that the same program will run on multiple platforms without modification. Currently Supported platforms are Microsoft Windows, Mac OS X and macOS, and Linux or other unix-like systems.

Applications Developed with wxPython:

- BitTorrent, a peer-to-peer BitTorrent application
- Editra, a multi-platform text editor
- Google Drive, desktop client for the Google cloud-based storage system
- Métamorphose, a batch renamer
- Phatch, a Photo Batch Processor
- PlayOnLinux and PlayOnMac, Wine front-ends