

Chapter 4

Introduction to Python Libraries



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Chapter Content

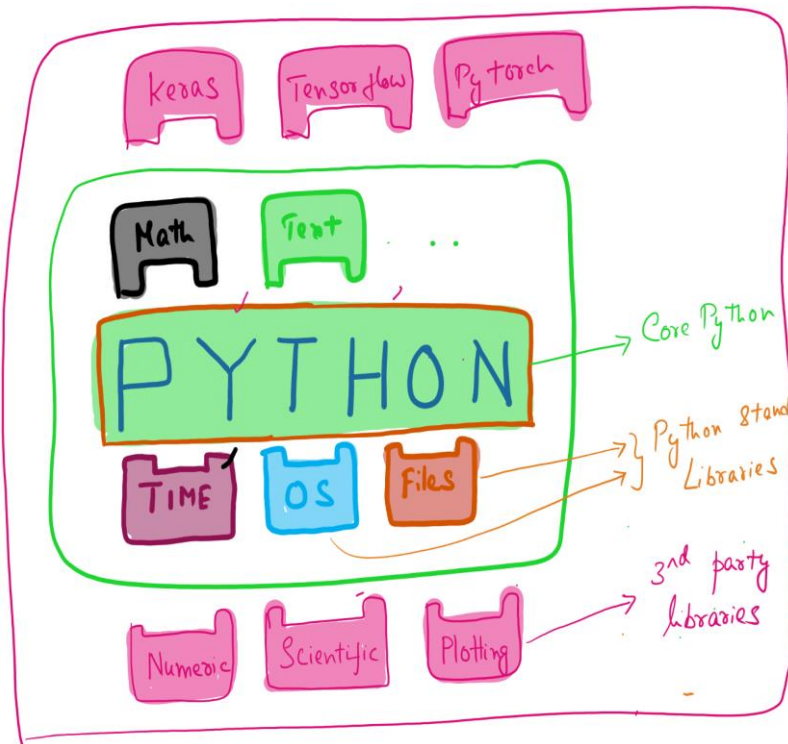


- Python Libraries
- Use of Libraries in Python Program
- The Python Standard Library
- 3rd Party Libraries

Python Library



- A Python library is a collection of related modules containing bundles of code that can be used repeatedly in different programs.
- It makes Python Programming simpler and convenient for the programmer when we needn't to write the same code again and again for different programs



→ Importing the libraries:

```
# Importing math library
import math
A = 16
print(math.sqrt(A))
```

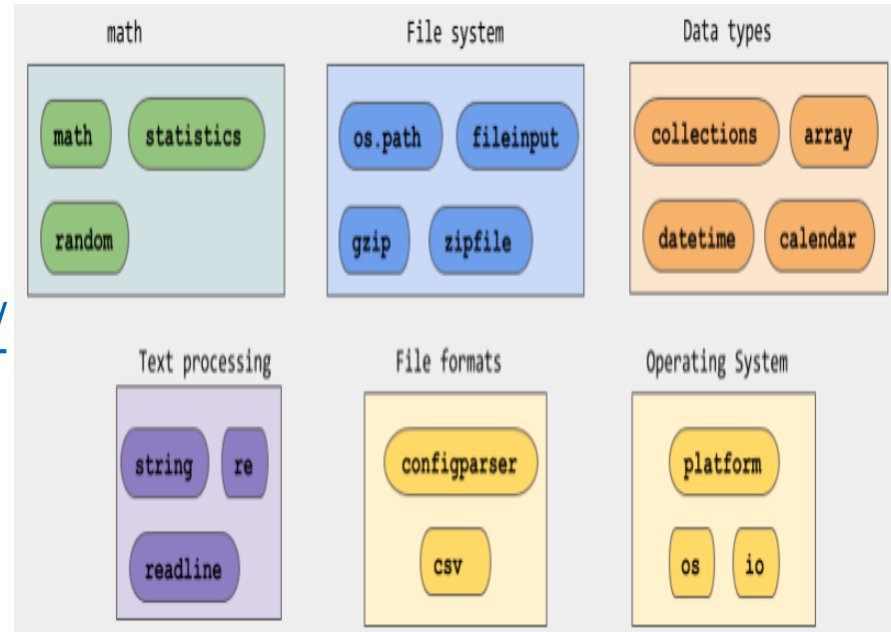
→ Importing specific items from a library module:

```
# Importing specific items
from math import sqrt, sin
A = 16
B = 3.14
print(sqrt(A))
print(sin(B))
```

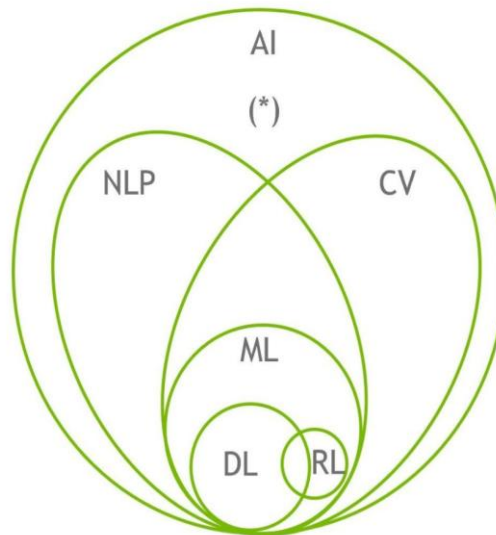
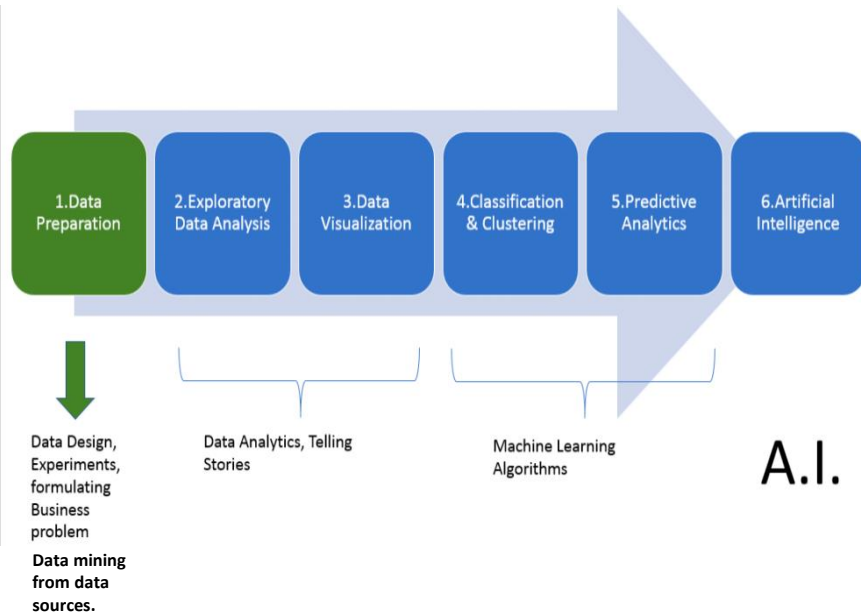
→ ***Python Standard library*** plays a very important role to access to the system functionalities of Python

<https://docs.python.org/3/library/>

→ The library contains more than 200 core prebuilt pretested modules (written in C) that are provided as part of the default python installation itself.



- Are open-source libraries (packages) developed by somebody else and made available for download using a standard interface.
- used to create applications and models in a variety of fields, e.g. machine learning, data science, data visualization, image and data manipulation, and many more.
- Find, install and publish Python packages with the Python Package Index <https://pypi.org/>
- Using ***pip*** to install packages
`pip install <packages>`



AI = Artificial Intelligence
 NLP=Natural Language Processing
 CV=Computer Vision
 ML=Machine Learning
 DL=Deep Learning
 RL=Reinforcement Learning

- There are several Python tools for scraping data used in Python machine learning models.
- These libraries are known for web crawling, data scraping and arrange it into the required format





Python Libraries for Data Analytics



→ There are several Python tools for processing and visualizing data.





Machine Learning Python Libraries

(Traditional Algorithms)

- provide the implementation of traditional Machine Learning Algorithms like classification (SVM, Random Forest, Decision Tree, etc), Clustering (K-Mean, etc),... except neural networks.



XGBoost



CatBoost

Deep Learning Python Libraries



TensorFlow



Keras **mxnet**



PyTorch



Pylearn2



Reinforcement Learning Python Libraries



→ There are libraries designed to have all the necessary tools to both implement and test Reinforcement Learning models.



Dopamine

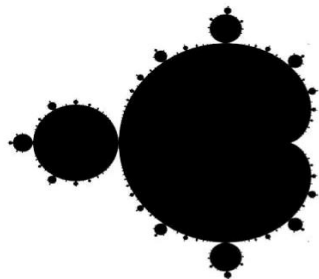


DeepMind
TRFL



NLP Machine Learning Libraries

→ There are many Python libraries that can be used for practically implementing natural language processing (NLP) and text mining tasks.



TextBlob

spaCy

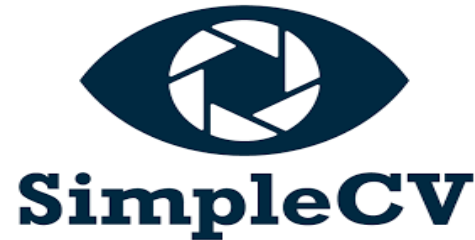
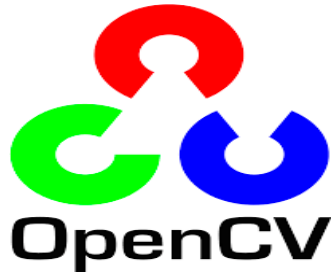




Computer Vision Python Libraries



→ Python provides several computer vision libraries and frameworks for developers to help them automate tasks, which includes detections and visualisations.





Several Demos in Python libraries for Machine learning



- Link demo 1
- Link demo 2
- Link demo 3