Lecture 0 - Intro to Python

January 17, 2023

1 What's Python?

- Python is an interpreted, object-oriented, high-level programming language with dynamic semantics
- Its has high-level built in data structures, combined with dynamic typing and dynamic binding
- It is attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together

2 How to install Python

Simple but not popular way:

- Go to: https://www.python.org/downloads/
- Download it!

After you download it, you can use it from CLI.

3 Jupyter Notebook

Link https://jupyter.org/

The Jupyter Notebook is a web-based interactive computing platform that allows users to author data- and code-driven narratives that combine live code, equations, narrative text, visualizations, interactive dashboards and other media.

The best way to install Jupyter Notebook is via **Anaconda** (stand alone installation may cause errors).

4 Anaconda

Link: https://www.anaconda.com/

5 Anaconda

6 Jupyter Notebook

7 Basics of Jupeter Notebook

- You can Jupyter Notebook as a text editor with Latex
- You can use it as a coding tools
- You can do both in a single file!

[1]:
```
print("Hello Python")
```

```
Hello Python
```

[2]:
```
print(1*1)
```

```
1
```

[3]:
```
# To use Math function, we can import the packpage math
import math
print(math.exp(1))
print('Exponential of %f is %f' % (1,math.exp(1)))
```

```
2.718281828459045
Exponential of 1.000000 is 2.718282
```

[4]:
```
#More math, especially with vectors, matrix, etc --> use numpy

import numpy as np
a = np.array([4,4,4])
b = np.array([1,.5,2])
print(a)
#print(a*b)
x=a**2
print(x)
#print(math.tan(a))
#print(np.tan(a))
```

```
[4 4 4]
[16 16 16]
```

8 Exit ticket

Ex 1: Install Python and Jupyter Notebook in your computer

Ex 2: Play with the "print" command in Python, especially with complicated strings.

Ex 3: Play with the "math" package in Python: work with 10 built-in function of the math package.

Ex 4: Play with "numpy" packapge: define a matrix A of size 2×3. Find $A^T A$.