Basic Algorithms : Getting started with Python

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1 Some notes on Python

1.1 Introduction

The official introduction to Python is:

Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. Python's elegant syntax and dynamic typing, together with its interpreted nature, make it an ideal language for scripting and rapid application development in many areas on most platforms.

Python was created by Guido van Rossum, and released in 1991. It can be used on a server to create applications, connect to database systems, read and modify files, handle data and perform mathematics... It works on different platforms (Windows, Mac, Linux,...) with a simple synthax and runs on an interpreter system, meaning that code can be executed as soon as it is written.

1.2 Scope of the course

This course will be a basic introduction to the language. We will cover among other things the following :

- Install Python within a graphical user interface (GUI) system.

- Use the Interpreter Prompt and install useful modules.

- The applications that may help you get started with basic code.

- Handle common data objects such as arrays, data-frames and data types such as integers, strings and dates.

- Write functions to execute some treatments on your data.

- Communicate your results in the form of plots.

Interested readers may refer to the official Python tutorial for beginners [1].

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[1] `https://python.swaroopch.com/`

2 Personal homework

2.1 Installing Anaconda

For the purposes of this course, we will install python within the Anaconda system. Anaconda is a desktop graphical user interface (GUI) system that includes links to all the applications included with the distribution including IPython, Jupyter Notebook and JupyterLab.
Please go to this website [2] and download Anaconda.
You'll need to download the corresponding version depending on whether you're using Linux, Windows or Mac OS.

2.2 Opening Command Line

If you have just started coding, this will help you access the command line, depending on what operating system you use [3].

- MacOS: Open spotlight search and type in "terminal". Select the application called terminal and press the return key.

- Linux: You can open Terminal by directly pressing [ctrl+alt+T].

- Windows:

    - On Windows 10, open the start menu and go to the shortcuts folder called "Windows System". Pressing the dropdown menu should reveal a shortcut to open the Command Prompt application. Right click on the shortcut, press "More", and press "Run as Administrator".

    - For Windows 8, go to the start screen, press "All Apps", and scroll right until the "Windows System" folder shows up. You can find Command Prompt there.

    - For Windows 7, open the start menu and click on "All Programs". Click on "Accessories" and you'll find the Command Prompt shortcut. Right click on the shortcut and press "Run as Administrator".

2.3 Python

To install python in anaconda, you need to run the following command in your Command Line:

```
\On your command line
    conda install -c anaconda python
```

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[2] https://www.anaconda.com/products/individual
[3] https://towardsdatascience.com/a-quick-guide-to-using-command-line-terminal-96815b97b955

2.4 IPython

IPython is a development environment which is a useful interactive interface to Python. IPython also provides a number of useful syntactic additions to the language that will allow you to easily access documentation about the tools you're using.

```
\On your command line
    conda update conda
    conda update ipython
```

2.5 Jupyter Notebook

The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

```
\On your command line
    jupyter notebook
```

2.6 Materials

Please read the first chapter of the Python Data Science Handbook named "IPython: Beyond Normal Python" [4].

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[4] https://jakevdp.github.io/PythonDataScienceHandbook/