Python Summer

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Summary

This course introduces fundamentals of programming using Python.

Learning Python basics for data analytics

Objectives

- Learn basic programming with Python
- Write basic Python code
- Calculations using NumPy arrays (basics)
- Basic data analysis using pandas

Organization

- Language: English/French
- Lab-based courses on Colab
- 5 courses of 1.5 hours: should attend the 5 sessions
- Self-learning: point to videos and/or tutorials (notebooks) covering topics seen in the courses, going a bit further, or introducing concepts of the following course

Resources

Colab

The Python Tutorial

Python For Beginners

Python, Jupyter, Numpy

Python course for data analysis

1 Python Basics & Objects

1.1 Objectives

- Introduction to Google Colab
- How to write simple Python code
- Use variables, numbers, text, conditions, and loops
- Understand that everything in Python is an "object"

1.2 Topics

- Numbers, strings, booleans
- Variables, Operators
- if, else, for, while
- print() and input()
- Object methods like .upper() on strings

1.3 Content

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2 Functions, Lists, Dictionaries & Classes

2.1 Objectives

- Write code with fonctions
- Understand and manipulate lists and dictionaries
- Understand what a class is and implement a simple class

2.2 Topics

- define functions
- Lists and their methods
- Dictionaries (key-value pairs)
- Classes: **init**, self, attributes, and methods

2.3 Content

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3 Files, Data & Practice

3.1 Objectives

- Install/Import packages
- Read and write files
- Work with json data (like spreadsheets)
- Practice previous concepts (functions, classes, dict, etc.) using data

3.2 Topics

- Opening and reading files (.txt or .csv)
- Load a JSON file into Python using the json module
- Work with lists of dictionaries as datasets
- Practice building objects from data, use object in lists, etc.

4 Content

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5 Numpy

5.1 Objectives

- Use numpy for working with numbers and tables of numbers
- Do fast math on arrays (instead of writing loops)
- Introduction to indexing, broadcasting

5.2 Topics

- Create arrays with numpy
- Reshape and slice arrays
- Do stats with .mean(), .sum(), etc.
- Work along rows or columns (axis)
- Intro to broadcasting

6 Content

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7 Pandas

7.1 Objectives

- Use pandas to work with CSV data
- Load, filter, group, and summarize data
- Introduction of Matplotlib for visualization

7.2 Topics

- DataFrame and Series basics
- Load CSV files
- Filter rows, select columns
- Compute stats
- Handle missing data
- Simple plots

8 Content

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