MaFiRM 2022/23

Introduction to Python

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14 hours

Course objectives
The module is an introduction to the Python programming language. At the end of this module, students should be familiar enough with Python language to read and write non-trivial Python code, as well as to exploit Python for problem analysis using a vast series of external packages related to scientific computing and dataset processing.
Students will be taught how to write their own code through concrete examples. Students are encouraged to actively interact in class and will be asked to work on problem sets assigned during the lessons.

Topics
The module is an introduction to the Python programming language and deals with the following topics:

1. Introduction to Python language. Variables, and functions. I/O of data.
2. Data structures, Objects and Classes
3. Iterators, Generators, Closures
4. Libraries for numerical analysis and plotting: Numpy, SciPy, and Matplotlib.
5. Dataframes and Data analysis with the Pandas package: descriptive statistics, regressions, plots

Software tools
Python 3.8+ from https://www.python.org/downloads/
PyCharm Community Edition from: https://www.jetbrains.com/pycharm/download/

Textbook and course material
Code examples will be presented during the course. In addition, students may refer to:

- • Wes McKinney, Python for Data Analysis.
- • Allen Downey, Think Python. How to Think Like a Computer Scientist (available online for free at greenteapress.com/thinkpython/thinkpython.pdf).
- • Michael Dawson, Python Programming for the Absolute Beginner.

Exam type
Students will be evaluated (pass/fail) based on exercises assigned during the lessons and a final group project that will be assigned during the course.