Introduction

Francesco Marchetti

Fundamentals of Computational Mathematics

Summary (of my part!)

1. Introduction to numerical calculus
2. Floating-point numbers, machine precision
3. Conditioning and stability
4. Numerical solution of non-linear equations
5. Numerical solution of linear systems
6. Approximation of data
7. Numerical solution of differential equations

More details are available in the syllabus (updating)

Material

Slides and blackboards of the lessons, as well as the codes, will be available in Moodle.
Reference book: "Numerical Methods and Optimization in Finance", Manfred Gilli, Dietmar Maringer, and Enrico Schumann (Second edition), Elsevier.

Laboratory

In labs, we use Spyder to write and launch Python codes. A stand-alone version is available at
–> `https://www.spyder-ide.org/`

This will be enough for our purposes, but a more complete and customable version of Spyder can be obtained by including it in the Anaconda environment.

Moreover, there are of course many other programs to work in Python, you are free to choose others.

Examination

The exam (prof. Marchetti and Aprile together!) is composed by:

1. An individual written exam (possibly on the Moodle exam platform).
2. A group project.
3. An oral exam mainly focused on the project, but not only on the project.

We will come back to this in the next weeks.

Calendar (classes + labs)

Classes and labs will take place on:

- Tuesday, 10:30–12:30, P55
- Wednesday, 10:30–12:30, P55
- Thursday, 08:30–12:30, P55

We will provide a schedule for classes and labs (that may change during the course depending on the situation). During lab sessions, we will programme in Python, so bring your laptop if possible.