Introduction to Programming

Instructor	Andrew Yarmola (andrew.yarmola@uni.lu)
Course Schedule	Wednesday 14h00 - 15h30 Campus Kirchberg B21
Course Website	sites.google.com/site/andrewyarmola/itp-uni-lux
Office Hours	Thursday 16h00 - 17h00 Campus Kirchberg G103 and by appointment

Overview

The goal of this course is to provide an introduction to programming by focusing on practical tools, common practices and mathematical experiments. We will work almost entirely with the Python programing language. Python is a great general purpose language for scientific computing and fast prototyping. Additionally, we will learn how to use the git version control system. At the end of the course, students should be able to create and manage a small software project for scientific computing.

Along with basic programming skills and workflow, I hope we will be able to discuss some of the following topics: recursion, regular expressions, sorting algorithms, solving ODEs, trees, graph traversals and planarity, data manipulation and visualizations, machine learning and neural networks.

Prerequisites

No previous knowledge of computer programing is assumed. However, a good knowledge college level mathematics is required. Access to a personal computer for homework assignments and collaborative work is also necessary.

Software and Text

We will be working with Python 3.5 as part of the Anaconda distribution and the git version control system. You can find the links to download the necessary software below. You are free to use any other distribution of Python, but please try to resolve any compatibility issues yourself.

- Anaconda can be found at continuum.io/downloads.
- git version control software can be found at git-scm.com/downloads.
- other software we may use will be announced in class and on the website.

Our main reference for this course will be the SciPy Lecture Notes found at scipy-lectures.org. However, much of the material will be presented only in lecture.

You can also find many other resources for learning Python online. In particular, there is a French language text by Gérard Swinnen that students may find useful at inforef.be/swi/python.htm. Additionally, there is a great list of open access Python texts found at pythonbooks.revolunet.com.

Grading

The course will consist of weekly homework assignments, 2 (or 3) coding projects, and one final project. Homework and projects will be at first submitted via email and later using a git repository. You will collaborate on projects with other students in groups of two or three. For homework assignments, feel free to discuss the problems with other students, but the submitted work must be your own writing and code.

50 %	weekly homework assignments
30 %	2 (or 3) coding projects
25 %	final project