



Welcome!

Scientific Programming with Python

Federica Lionetto, Andreas Weiden, Roman Gredig, Nicola Chiapolini & Christian Elsasser



Story

- ▶ In summer 2013 we organised a summer school about advanced scientific programming in Python ([Link](#)) together with g-node.
- ▶ Due to the large interest, we decided to organise a “UZH-internal” school. Now we have the seventh edition.
- ▶ The content of this course was based on the 2013 school and has since been improved, adapted and expanded continuously.
- ▶ This year’s edition is the first virtual one happening completely online.



Python 3

We use throughout the course Python 3: Use `python3` command (`python` points to Python 2)

Most relevant changes

- ▶ `print("Hello, World!")`
- ▶ Larger use of iterators and views (*e.g.* `range`, `dict.keys()`)
- ▶ Division returns float ($1/2 = 0.5$); integer division is `//`
- ▶ Differentiation between text and (binary) data; text \rightarrow `str` (UTF-8), data \rightarrow `bytes`

How to port code

1. Bring your code at least to Python2.6 standards
2. Use `2to3` to implement the changes
3. Test it and adapt the missed pieces/issues

Support for Python 2 ended on 1 January 2020!



Schedule

One topic per half-day (lectures, question time and tutorials)

Part	Morning	Afternoon	Where
Lecture	Flexible – but before the question session		
Question session	10:00 - 10:30	15:00 - 15:30	Main room
Tutorial	10:30 - 12:00	15:30 - 17:00	Group rooms

Topics

Day	Morning	Afternoon
Monday	Best practice and git	Object-oriented programming
Tuesday	Testing, Debugging, and Profiling	Pandas intro and self-study time
Wednesday	Data Structures	Scientific Analytics
Thursday	Python and C/C++	Hardware-assisted speed-up techniques
Friday	Visualisation and More	Projects & Questions



Homepage

www.physik.uzh.ch/~python

Programme

- ▶ Schedule
- ▶ Slides, links to lecture videos, links to Slido (questions)
- ▶ Exercise/tutorial material

Internal

Password protected

- ▶ Internal page with the links to rooms

Computing

- ▶ Computing information
- ▶ Image of the operating system used in the tutorial sessions



Lectures & Question Sessions

You find all resources for the corresponding lecture on its page (accessible via Programme page)!

Lecture

- ▶ The lecture is delivered in the form of a video.
- ▶ We upload the video link and the material at least one day prior to the lecture.

Question session

- ▶ We use **Slido** ([sli.do](https://www.sli.do)) to collect questions!
- ▶ You can find the corresponding links to the event in Slido on the lecture pages (1 link per lecture plus a general Slido event).
- ▶ You see the questions of other participants and can upvote them (= “also relevant for me!”)
- ▶ Slido is accessible also from mobile devices (*i.e.* you can use your mobile phone to post questions while watching the lecture on your laptop).



Tutorial Sessions

- ▶ Groups of two or three participants
⇒ working in groups = learning from each others
- ▶ Assignments on internal page
- ▶ Separate rooms plus git repository (see room overview)
- ▶ If you need some help/have questions, please put the status of your room on the room overview on orange (= need some help!) or red (= urgently!).
- ▶ VirtualBox Image for the school: Debian Buster with all the packages required for the tutorials installed. Download the Image from the section “Computing” of the website.
- ▶ Topics covered in the tutorial sheets are typically too much ⇒ pick what you are most interested in and you can try the rest later (Tuesday’s and Friday’s session or at home)



Using the School Image

- ▶ **Login: account: student, password: student**

All passwords are actually “student”.

- ▶ We make heavy use of the terminal, but you are welcome to use the graphical file manager (“Dolphin”).
- ▶ For editing files use your favourite editor. If unsure, use `kate`.
- ▶ `student` has `sudo`-rights, so you can install additional software.
(Ask us for help if you just understood nothing and would like to install something nevertheless.)



Social Evening

Usually we have on Wednesday a social evening with a dinner – this year that will not work!

We are planning to have **an event later during the year** (when we are back to normal)!

The idea is to have a session on Python topics (starting at about 16:00) followed by a dinner (starting at about 19:00).

More details will follow!



ECTS Points / Confirmation

The course allows you to obtain 1 ECTS point.

Students which can log in to the UZH module booking tool (<http://www.students.uzh.ch/en/booking.html>) can book the module (3129/PHY225.1). **Please do so until Tuesday 09:00.**

Please inform us in case of problems!

All students will receive a signed confirmation listing also the number of ECTS points.



Acknowledgement

We owe our gratitude to

- ▶ Faculty of Science UZH and Physics Institute for the funding
- ▶ Institute of Mathematics for the online platform
- ▶ Faculty of Science UZH, Physics Institute, Swiss, Dectris & Swiss Re for the tutors

Coffee Breaks – the most important thing

Coffee breaks will also be a bit different this year:

- ▶ We have a virtual coffee room (see room overview).
- ▶ Feel free to go there whenever you want!
- ▶ The idea is to have people meeting there for an **after-lunch coffee from 13:00 to 13:30!**

Copyright 2007 by Randy Glasbergen.
www.glasbergen.com



“Stop drinking coffee for a week, then start drinking it again.
It’s the same effect as rebooting your computer.”