

PROGRAMMING IN PYTHON I

Introductory Information for Lecture and Exercise



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Why Python?

- (Relatively) easy to learn.
- Powerful high-level language that fits many purposes.
- Widely used:
 - ☐ Shell-Script alternative
 - ☐ General programming
 - ☐ Web development
 - ☐ **Statistics/Data science**
 - ☐ **Bioinformatics**
 - ☐ **Machine learning**



Goals

- **Main goal:** Practice-oriented knowledge of Python programming based on two major parts
- Part 1: Basic programming principles in Python
 - Comments, variables, console in- and output
 - Control flow (conditions, loops)
 - Data structures (lists, tuples, sets, dictionaries)
 - Functions, modules, exceptions
 - File handling
 - Classes
- Part 2: Useful and important Python modules
 - os, sys, subprocess, argparse, regex
 - numpy
 - matplotlib
 - torch (introduction to machine learning with PyTorch)
- This is a rough schedule and might be subject to change

How to Get Good at Software Engineering?

- Python I/II will provide you with the basics to create your ML projects.
- Python I/II will not make you a full-fledged software engineer.
- Want to specialize more in computer science? Check out courses in the Computer Science study!

Lecture (VL)

- The lecture takes place **from 12:00 to 13:30** (weekly).
- Additionally, a **Zoom** link is available.
- All students enrolled via KUSSS are automatically enrolled for the **Moodle** course.
- Videos of the stream are uploaded to Moodle afterwards.
- Please use the **Moodle lecture forum** for any questions.

Lecture Grading

- Multiple-choice exam via Moodle (**info**):
 - ☐ Exam: **18.01.2023** (topics: entire lecture)
 - ☐ Optional retry exam: **22.02.2023** (topics: entire lecture)
 - ☐ Optional retry exam 2: **25.09.2023** (topics: entire lecture)
- If you participate in multiple exams, only the most recent one counts, regardless of whether you performed better or worse.
- In order to pass the course, $\geq 50\%$ of all points are required.
- Once you participated in an exam, you will be graded.

Exercise (UE)

- There are multiple weekly exercise groups that take place at **different times and locations** (check **KUSSS**).
- The exercise **from 13:45 to 15:15 on Wednesday** is also recorded and the video is uploaded to Moodle afterwards.
- All students enrolled via KUSSS are automatically enrolled for the same **Moodle** course as the lecture (all groups have access to the same, shared materials).
- Please use the **Moodle exercise forum** for any questions.

Exercise (UE)

- For the exercises, there is **mandatory presence**.
- Modes:
 - ☐ Physical: signature list
 - ☐ Virtual: Zoom participants list. Ensure that your username is set to **firstname(s) lastname(s)** as shown in KUSSS/Moodle, including your **matriculation ID**. Example: Andreas Schörgenhumer (k01234567)
- You are allowed to miss 4 lessons without any reason. If you miss more, you will get a negative grade.
- Exceptions can be made in extraordinary situations, such as illness or a family emergency (a vacation is **not** a valid reason for missing a lesson). Send me a mail in this case.

Exercise Grading

- The grade is determined based on 1100 points from:
 - 10 assignments: 100 points each
 - Exam: 100 points (this is the **lecture exam**, i.e., there is no separate exercise exam)
- Rules to pass the course (must fulfill **all!**):
 - A)** $\geq 25\%$ of the achievable points for ≥ 8 assignments
 - B)** $\geq 50\%$ of all achievable assignment points (combined)
 - C)** $\geq 50\%$ of the achievable exam points
- There will be 1 optional bonus assignment with 50 bonus points. These points will simply be added to your total points before calculating the final grade.

Grading VL + UE

Points	Grade
$\geq 87.5\%$	(1) Sehr Gut
$\geq 75\%$ and $< 87.5\%$	(2) Gut
$\geq 62.5\%$ and $< 75\%$	(3) Befriedigend
$\geq 50\%$ and $< 62.5\%$	(4) Genügend
$< 50\%$	(5) Nicht Genügend

Exercise Grading: Example 1

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Exam
95	100	39	13	86	71	20	100	83	100	82

■ Checking rules:

A) 8 assignment with $\geq 25\%$ (A4 and A7 are below): ✓

B) Total assignment points are $707 \geq 50\%$: ✓

C) Exam points are $82 \geq 50\%$: ✓

■ Calculating total points and grade:

☐ Total assignment points + exam points are $707 + 82 = 789$

☐ If the bonus assignment was submitted, add it now

- Example: 47 bonus points

- Total points are $789 + 47 = 836$

☐ Course percentage is $\frac{836}{1100} = 76\% \rightarrow (2) \text{ Gut}$

Exercise Grading: Example 2

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Exam
0	100	100	13	100	100	20	100	100	100	100

■ Checking rules:

A) 7 assignment with $\geq 25\%$ (A1, A4 and A7 are below): **X**

B) Total assignment points are $733 \geq 50\%$: ✓

C) Exam points are $100 \geq 50\%$: ✓

■ Rule **A** not fulfilled \rightarrow (5) Nicht Genügend

Exercise Grading: Example 3

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Exam
100	100	100	100	100	100	100	100	100	100	49

■ Checking rules:

A) 10 assignment with $\geq 25\%$: ✓

B) Total assignment points are $1000 \geq 50\%$: ✓

C) Exam points are $49 \geq 50\%$: ✗

■ Rule C not fulfilled \rightarrow (5) Nicht Genügend

Plagiarism

- Plagiarism is copying work (colleagues, Internet, books, papers, . . .) without properly citing the original source
- **Do not plagiarize!**
- You must write the code of the assignments yourself: Do not copy code from other students or from the Internet!
- If we identify plagiarism, this will immediately lead to a negative grade for all participants!
- This does not mean that you cannot discuss assignments with your friends and colleagues! On the contrary, we highly encourage such discussions and that you help each other, but please refrain from copying each others code.¹

¹This also includes group work where everyone participated equally but the code is still the same. Try to solve the programming tasks on your own.