

**Response to Student Feedback
received for the course
CS-EJ3211 - “Machine Learning with Python”
offered during May - July 2020
at Aalto University and within FiTech <https://fitech.io/en/>**

Teacher: Assistant Professor Alexander Jung

Teaching Assistants: Shamsiiat Abdurakhmanova, Mikko Salervo and Ivan Baranov

(first.last (at) aalto.fi)

August 19, 2020

We express our sincere gratitude for the constructive comments and suggestions provided by the students of the course CS-EJ3211 “Machine Learning with Python” as offered during summer 2020. We have tried to address all comments to the extent possible. Major modifications we implemented include the following:

- We now try to make the attendance of online lectures more attractive by offering bonus points for constructive contributions during the zoom lecture.
- We have replaced the auto-graded coding assignments, with quizzes to assess student understanding. These quizzes are offered in the MyCourses page mlwithpython.cs.aalto.fi and consist of several multiple-choice questions which cover the contents of the Python notebooks for each round. The Python notebooks are now primarily meant as tool for students to find the correct answers for the quiz questions. Using MyCourses quizzes has the advantage of allowing for immediate feedback to student submissions. Moreover, the quizzes allow to gear the assessment more towards the understanding of basic concepts instead of Python skills.
- We have revised the course schedule. The first half of the course consists of six thematic rounds forming a bootcamp for basic skills. The second half is dedicated to student projects.
- We will use peer grading of student project reports to facilitate student-student interaction. Having each student reviewing several other student project reports allows to get an overview of a more diverse set of ML applications.
- We will award bonus points for constructive contributions to the course discussion forum (“Slack”). We hope that offering these bonus points will support the student-student interaction.
- We will add more references to Python code snippets in the zoom lectures. These references should better illustrate how machine learning concepts can be implemented in Python.

In what follows, we respond in a point-by-point fashion to selected student feedbacks received for the “2020 summer” course edition during the official feedback survey carried out for courses at Aalto university. The student feedbacks are enumerated as S1,S2,... and the corresponding response as R1,R2,...

S1 *Some of the task descriptions were phrased in an unclear way.*

R1 We have revised the notebooks carefully to avoid any misunderstandings.

- S2 *Lectures can explain more about programming part*
- R2 We will now make more references to the Python notebooks during the lectures.
- S3 *The schedule of the course could have been better informed, such as when does each of the round start and when are their deadlines.*
- R3 We will announce the schedule well before the course starts via the MyCourses page mlwithpython.cs.aalto.fi
- S4 *More examples would be useful*
- R4 We plan to use peer grading for the student project reports. During the peer grading, students learn about the machine learning problems considered by other students.
- S5 *On-the-fly feedback on the assignments: not only "sanity checks".*
- R5 We plan to use MyCourses quizzes to replace the auto-graded student tasks in the Python notebooks. These MyCourses quizzes provide immediate feedback to student submissions.
- S6 *Lecture times could be announced a bit earlier*
- R6 We will try to be more timely and clear in the announcement of lecture times.
- S7 *Lecture times could be announced a bit earlier*
- R7 We have now created a dedicated Section on the MyCourses page (mlwithpython.cs.aalto.fi) entitled "Lectures and Talks" which lists the times of lectures and talks. We will try out best to finalize this list before the course starts.
- S8 *The grading is quite easy for students and does not at itself encourage to do the obligatory projects, as the project topics were quite challenging. Could be better if the project was a semi-mandatory part of course but a bit easier and smaller in scale.*
- R8 The student projects are not meant as obligatory but rather as another task that can be used to earn points. However, we will adapt the course schedule (bootcamp during first period and then plenty of time for project) to make student projects more attractive. Moreover, we will provide more examples for student projects.
- S9 *I think I also lacked more content on the lectures which would tie homework with theory. Most of the time I felt that theory is too high-level and assignments are too specific. This gap needs to be bridged with some demo sessions or seminars where theory for topic X is joined with some practice before doing the assignments.*
- R9 We will try to have more references to the coding assignments during the lectures. In particular, we plan to walk through parts of the notebooks during the lectures.
- S10 *It might be my preference only, but it would have helped me a lot more to have the tasks in a notebook and the learning material for the specific round in a PDF or some downloadable format. When I wanted to revisit a topic while working on the tasks, it was difficult to scroll and find the material or to have to reopen a previous notebook and scroll to find some information I wanted to revisit. I believe it would have helped me out a lot to have the tasks and learning material in separate files.*
- R10 We will now provide pdf printouts of the Jupyter notebooks for students convenience. These printouts can be found at the MyCourse page under Section ????
- S11 *Some of the bonus task have a too high score.*

- R11 We will adjust the maximum number of points awarded for the bonus tasks.
- S12 *The notebook have sometime part that are too adavced for the course.*
- R12 We have adjusted the amount of background information (e.g., interpretations of certain parameters) provided in the notebooks. Moreover, we now provide more pointers to background reading (beyond the scope of the course).
- S13 *The schedule of course was problematic: 3 first rounds ended at the same time, already during the first weeks.*
- R13 We are now more strict with allowing late registrations only in special circumstances. This allows us to use interleaved deadlines for the first rounds of the course.
- S14 *My personal problem was also lack of knowledge in Python. It was very difficult to get started.*
- R14 The slack discussion forum will now have a dedicated channel "python-newbies" to discuss basics of Python programming.
- S15 *Some of the slides were quite messy and not clear enough..*
- R15 We have carefully revised the lecture slides in order to improve their clarity.
- S16 *This is the first course where there was no tutoring or even correct answers given to the programming exercises, and that's the basic requirement to complete the course.*
- R16 We will replace the autograding of Python notebooks with multiple choice questions provided in quizzes on the MyCourses page of our course. This will provide immediate feedback to student submissions.
- S17 *The fact that you could be very close to having the correct solution, but still get zero points. So I think that partial points would've been a good thing.*
- R17 We will replace the autograding of Python notebooks with multiple choice questions provided in quizzes on the MyCourses page of our course. This offers a more fine grained grading scheme that allows to take partially correct answers into account.
- S18 *There could have been a final chapter in which all the themes are summed up so that we would get a "bigger picture" of what's going on.*
- R18 We are considering to organize a final workshop that includes presentations of student projects. These presentations should give an overview of the different course contents from student perspectives.
- S19 *Mycrouses page was messy.*
- R19 We have carefully revised the organization of the MyCourses page mlwithpython.cs.aalto.fi to improve its usability.
- S20 *Jupyterhub doesn't always save ones work so it was frustrating to do the same again.*
- R20 We have now added a hint in the Mycourses section "Python notebooks" to regularly save the Python notebook.
- S21 *For quite many of the exercises I felt that I was struggling much more with syntax issues of Python since I have not really used it before, instead of having issues with understanding what I am supposed to do in a certain task. This caused me a lot of frustration, and I hope that more empasis should be put on building the exercises so that they measure your understanding on the topic rather than googling syntax tricks.*

- R21 We have now created a dedicated "python-newbies" channel in the slack discussion forum to discuss basic of Python syntax. Moreover, we have replaced the autograded coding assignments with multiple choice questions. These questions are loosely coupled to Python notebooks but target more the understanding of basic concepts in machine learning instead of Python details.
- S22 *Maybe the points system on the coding assignments is still a bit confusing and I for example have no idea how many total course points do I have.*
- R22 We will now make more clear how the points collected so far by students can be verified in the MyCourses gradebook.
- S23 *A python programming course focusing on machine learning should be introduced and used as a prerequisite for the course.*
- R23 We now point out the Python tutorial <https://www.w3schools.com/python/> for a refresher for basic Python skills. Moreover, we also point to the basic programming courses offered at <https://fitech.io/en/programming/>.
- S24 *A python programming course focusing on machine learning should be introduced and used as a prerequisite for the course.*
- R24 We have added pointers to the Python tutorial <https://www.w3schools.com/python/> for a refresher for basic Python skills and to the basic programming courses offered at <https://fitech.io/en/programming/>.
- S25 *It would have been super helpful to have two sessions addressing the most common errors in the coding tasks, or the repeated questions in slack or in the feedback form for each round.*
- R25 We will have zoom exercise session which discuss common mistakes and another set of zoom sessions discussing model solutions.
- S26 *I personally wanted to see more coding, and how to create your own projects/what steps to take when doing your own project.*
- R26 We have revised the course schedule such that students first focus on the basic skills during a six rounds bootcamp. The latter half of the course will be devoted to the student projects. Moreover, we will also use peer grading which gives each student the opportunity to get a glimpse of projects from other students.
- S27 *The online lectures were a bit chaotic. A stricter approach with questions only at the end, not in the middle could have been better option.*
- R27 We will try to be more selective in taking on questions during the talk and mainly use the end of the lecture session to answer questions posted during the talk.
- S28 *The lecture schedules should be preset, now it was a bit of mystery on which day the lectures were held and planning other life around them could have been troublesome if I weren't working from home.*
- R28 We now clearly indicate the lecture times in the Mycourses page section "Lectures and Talks" in due time.
- S29 *More theoretical material.*
- R29 We try to make more clear the pointers to background reading (beyond the course requirements).

- S30 *I thought the bonus assignments were a bit confusing, I wasn't always sure what I was supposed to be doing and what was extra. But it might be because of I haven't used Aalto university's MyCourses before and it was sometimes a bit tricky to find the assignments.*
- R30 We now list all bonus tasks in a dedicated Mycourses page section "Bonus Tasks".
- S31 *Not sure what to improve in the course itself but Aalto university course pages (platform) can definitely be improved. It was a bit hard to navigate them in the beginning.*
- R31 We have cleaned up the organization of the MyCourses page. In particular, we have collected the different course activities for the six rounds into one section "The Six Rounds Bootcamp".
- S32 *Not sure what to improve in the course itself but Aalto university course pages (platform) can definitely be improved. It was a bit hard to navigate them in the beginning.*
- R32 We have cleaned up the organization of the MyCourses page. In particular, we have collected the different course activities for the six rounds into one section "The Six Rounds Bootcamp".