LUT University

LUT Computer Vision and Pattern Recognition Laboratory 2020-11-26

BM20A6100 Advanced Data Analysis and Machine Learning

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Practical Assignment Instructions

1 Generic Problem Statement

Your assignment is to perform a data analysis task according to a *separate problem description* published in Moodle. The data to be used is given as background information. The general objective in the analysis is to study the data and carry out the task defined in the problem description. Your task is to implement the data analysis and visualisation preferably in Matlab, but another programming environment $\mathcal{X}$ can also be used when agreed with the supervisor of the practical assignment.

For appropriate focusing of the task, you have to do the following:

1. If there are multiple options for the research question in the separate problem description, select one of those according to the instructions.
2. Enrol to a corresponding group in Moodle (each group member should do this).
3. Read carefully the problem description and follow its instructions in addition to the general ones presented below.

2 Requirements

The practical assignment is meant to be done in freely selected groups of three students. If someone wants to work alone or in a group of two students, this is also possible.

To carry out the *programming task*, you must obey the following rules:

- Allowed: Use of standard and external Matlab/$\mathcal{X}$ toolboxes. Also other tools mentioned in the assignment description or already given for solving the assignment can be used.
- Not allowed: Use of any source code or software prepared by someone else than the group members, unless mentioned in the description or agreed with the supervisor of the practical assignment. Even code excerpts cannot be used without properly mentioning the source(s) in the code and in the documentation.

To prepare the *documentation* of your work, you must obey the following rules:

- Allowed: Use of references if you acknowledge them (proper citations to the references are required).
- Not allowed: Use of any material prepared by others (without properly acknowledging the source), or direct copying of text from a reference.

By returning the assignment you assure that i) you acknowledge all sources, and ii) you have not used any forbidden material. *Plagiarism is not allowed* and *all incidents will be processed.*

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2.1 Implementation

For the implementation, use standard Matlab/$\mathcal{X}$ and its toolboxes. Also other software can be used if it is necessary for solving the task, but this has to be agreed with the practical assignment supervisor. In this case, you must acknowledge the source of the software.

Remember to properly comment your code. The first comment line of each code file must contain `STNUM` where `STNUM` is the student number of one of the authors. Write also a concise help section for your codes that tells the purpose of the function, usage, and explanation of the parameters.

2.2 Documentation

Write a report in English about your project. The documentation should include a cover page where you give the course number and name, project title, date, and the names and student numbers of the authors.

Describe the methods used for solving the task in such detail that a reader understands your approach and would be able to reproduce your results. Cite the relevant references for enabling the understanding of the approach. Justify your choices by presenting the grounds to select the methods for your solution.

In the report, include the main results of your experimentation. Analyse the results critically.

3 Deadline and submission

The deadline of submitting the results of your work to Moodle is **Friday, 18 December 2020 at 12:00 EET**. The results containing the documentation in pdf format and all relevant codes must be packed into a single `zip` package. The file name of the package must be `STNUM.zip` where `STNUM` is the student number of one of the authors. When `STNUM.zip` is extracted, it should create a single directory `STNUM`. This directory should contain a `readme.txt` file describing the contents of the directory and instructions how to use your implementation.

4 Grading

The work will be evaluated based on the submitted report and implementation according to the following criteria:

1. *Methods*: The documentation contains grounds for *method selections* and such *method descriptions* that enable understanding the solution.
2. *Successful implementation*: The code is properly commented. Based on the results presented in the report, the *implementation works* for the described purpose.
3. *Results and analysis*: The document include an *appropriate presentation* and *in-depth analysis* of the results to support the conclusions in the report.
4. *Documentation*: The report includes all the standard parts and relevant references.

In addition to the "standard" criteria described above, the following criteria will be taken into account in the evaluation if necessary:

- Novelty of the approach or results. (If the idea comes from somebody else's work, you must acknowledge the source.)

- The difficulty of implementing the selected approach. (However, the implementation has to work for the purpose.)
- A well-designed demonstration or visualisation.

Based on the evaluation, the work will be graded using the standard scale {0, 1,..., 5}. the practical assignment grade affects the final grade of the course. To pass the course, the grade of the practical assignment must be at least 1.

5 Notes and tips

If there are any problems with the assignment description and/or data, contact the person supervising the practical assignment. This should be done before inventing your own interpretations or making too straightforward assumptions about the rules or what is expected.