DSAI4101 – Applied Deep Learning
Term Project Requirements for 2025F

Deadline: **29.11.2025 (11:59 pm)**

Deliverables: **1) Project code (in .ipynb format)**

                        2) Project report (in .pdf format)

I.   General Requirements

You must submit your term project in the scope of your DSAI4101 Applied Deep Learning course. This document presents the detailed requirements of your term project. Please read all the items in this document carefully.

II.   Ethical Requirements

In addition to the general ethical requirements of our university, please note that this is not a group project.

1) You **must** develop your code and write your report **on your own**.
2) You **cannot** do your projects in groups.
3) You **cannot** submit a code file available on the internet.
4) You **have to** pass **the similarity check** for your project to be graded.
   a. Remember that a **similarity-checking** tool will investigate the codes and reports. If the similarity ratio is high, none of the listed parties will receive a grade for the term project.
5) If you use AI tools to develop only "some part" of your code, indicate explicitly (all the line numbers must be given). You will not get a grade for your project if you do not indicate AI-developed code in your submission.
6) No AI tools to develop project reports will be accepted. The reports will be checked using similarity tools.

III.   Technical Requirements - Code

You will develop Python code to classify an image dataset in your Deep Learning project. You can develop this code:

1) Using PyTorch or
2) Using the baseline code you developed in the lab sessions (please note that you might need to develop several new functions to perform classification better).
3) Deep learning frameworks other than PyTorch will not be accepted unless you have approval from the instructor.
4) PyTorch might use a GPU, but your code **must** support "CPU" as well.
5) **Dataset:** You are required to classify the "*project*" dataset. You can download the dataset from the D2L – Project folder.
6) The code must work under the Anaconda environment (Python 10 or above) with an IDE, Jupyter Notebook, VS Code, or PyCharm.
7) If you need to install additional packages, write them into your code in the following format: ! pip install package1, package2, …

8) Do not use the "requirements.txt" file or a similar style to install dependencies.

9) The current directory must only include your Python file(s).

10) The dataset must exist in the **"data"** folder of the current directory.

11) If you use additional files/settings, they must exist in the related folders.

12) You must use the "**F1**" score as your evaluation metric, not accuracy.

13) You will build a "**DNN**", not a CNN nor another architecture.

IV. Technical Requirements – Project Report

Your report **must** include all the items given in the **"DSAI4101-Project Report Template"** document.

V. Deliverables

You must submit a RUNNING CODE before the project deadline. If your code is not working somehow, it will not be graded. Further, you must submit the following to the Dropbox folder provided:

1. Python source code files (if used, all the supplementary files to make it work) in **".ipynb"** format.

2. Project report in PDF format.

VI. Grading

1. The projects will be graded out of 100.

2. The project grade constitutes 20% of the course grade.

3. The maximum performance of the classification task, satisfying all the given requirements above, will provide you with an **extra grade**!

VII. Deadline

- The project submission deadline is November 29th, 2025.
- Late submissions will result in a 30% daily grade decrease.

Hints:

1) Please remember that you must read several image files from different folders, the names of which are the class names.

2) Since the images might be of different sizes, you must scale them to the same size. The preferred size could be 224x224 (this size would be better for CNN as well)

3) Implementation:
   a. For PyTorch, you can store images as PyTorch tensors.
   b. Otherwise, you can keep images in NumPy arrays.

4) If you want to use the code baseline given in the lab, you must develop functions to calculate Softmax and its derivative.