

# Projects for Machine Learning

A.A. 2024/25

This document describes the projects for Machine Learning during the academic year 2024/2025 (hence, this document is valid only for the academic year 2024/2025). Projects are mandatory, whether you take the midterm/final or the oral exam. The project will contribute to 30% of your total grade in the class. A further 10% will be assigned on the day of the final/exam following theoretical and/or technical questions on the project itself.

## Instructions

You will have the chance to decide on four different projects assigned by two different entities: **Reply SpA** and **LUISS**. You can work in groups of **at most 3 people**.

Full projects presentations are on Luiss Learn webpage, please carefully check them before submitting your bid.

To express your preferences, the team's "captain" (a.k.a. the referent for the team) must **fill in the form before March 13<sup>th</sup>** on <https://forms.gle/dHoQphKKNatrorBv7>.

Your email address will be used to establish contact with the company running the project, so please make sure that (a) all email addresses are correct, and (b) you agree to share your email address with the company.

We will try our best to assign you a project according to your First Project Preference. However, it is also important that the teams spread across the different projects. Thus, we will try to balance different projects and, generally, we will apply a first come first served approach. If you do not fill in the form by the given deadline, you will be assigned to a project and to a team by the instructor.

# When and what to submit

You must submit your project by **May 12<sup>th</sup>, 2025, at 11:59 PM**, ensuring it is received before the May 13<sup>th</sup> deadline.

The project submission must be coordinated with the entity running the project, LUISS or Reply SpA.

Each group must also **submit via mail** to [gitaliano@luiss.it](mailto:gitaliano@luiss.it), [fangeletti@luiss.it](mailto:fangeletti@luiss.it) and [ampanti@luiss.it](mailto:ampanti@luiss.it), the URL of the **GitHub repository** containing also the **presentation** used for the final pitch. The repository's name must end with the student id of the “captain”.

The repository must contain:

1. A “README.md” file with the following information:

- Title and Team members
- [Section 1] Introduction – Briefly describe your project.
- [Section 2] Methods – Describe your proposed ideas (e.g., features, design choices, algorithm(s), training overview, etc.) and your environment so that:
  - A reader can understand why you made your design decisions and the reasons behind any other choice related to the project.
  - A reader should be able to recreate your environment (e.g., conda list, conda envexport, etc.)
  - It may help to include a figure illustrating your ideas, e.g., a flowchart illustrating the steps in your machine learning system(s)
- [Section 3] Experimental Design – Describe any experiments you conducted to demonstrate/validate the target contribution(s) of your project; indicate the following for each experiment:
  - The main purpose: 1-2 sentence high-level explanation
  - Baseline(s): describe the method(s) that you used to compare your work to.
  - Evaluation Metrics(s): which ones did you use and why?
- [Section 4] Results – Describe the following:
  - Main finding(s): report your results and what you might conclude from your work.
  - Include at least one placeholder figure and/or table for communicating your findings.
  - All the figures containing results should be generated from the code.
- [Section 5] Conclusions – List some concluding remarks. In particular:
  - Summarize in one paragraph the take-away point from your work.

- Include one paragraph to explain what questions may not be fully answered by your work as well as natural next steps for this direction of future work.
2. A single notebook called “main.ipynb” with ALL the code used for the project. The notebook must have the following characteristics:
    - Text and code cells must alternate from start to finish. The text cell above must describe the contents of the code below and its output so that a reader can easily follow up on your implementation. In particular:
      - You must explain what you will do and why you chose to do so.
      - You must explain the outputs of the cell (if any) with particular attention to describing figures such that a reader already knows what he is going to see.
  3. An additional folder named “images” contains the figures displayed in the “README.md”.

## Academic Integrity

You must write the code by yourself. The abuse of copy-paste or of Generative AI tools will be considered during the evaluation. Any code that, for some (nonsensical) reason, is not written by yourself must be referenced (with a link to the original code or with a prompt to a Generative AI tool). Copying the projects from other teams is also strictly forbidden. Your code will be validated by anti-plagiarism software. In the unlikely event of two projects being very similar, we will follow the Netflix Prize rules: only the first project published on GitHub will get the grade, and the other will get nothing.