Total points: 100

Deliverable 0: Class participation
Class participation credit: 10 points
Due: throughout the whole class

Deliverable 1: Standard MNIST Example + Project Declaration
- Credit: 5 points
- Due: Tuesday 02/11/2025, noon ET
- Approximate expected load: 8 hours
- Goals:
    - Setting up the software
    - Understanding building blocks of deep learning pipeline
    - Data loading, model files, training/inference, evaluation
    - Choose semester project
- To Do 1 (5 points):
    - Set up github repository
    - Install Conda/PyTorch + other packages
    - Train a CNN on MNIST dataset
- To Do 2 (5 points):
    - Declare what project you will be working on.
    - Submit project description. Length: 0.5 page

Deliverable 2: Training on a different dataset
- Credit: 5 points
- Due: Friday 02/18/2025, noon ET
- Approximate expected load: 4 hours
- Goals:
    - Train on another dataset
- To Do (5 points)
    - Submit results of training and testing on new dataset

Deliverable 3: Midterm report
- Credit: 15 points
- Due date: Tuesday 03/04/2025, noon ET
- Goals:
    - Literature review
    - A clear plan
    - Initial progress on project

- To Do:
    - Project Proposal
    - Suggested length: 3 pages (not a hard requirement, just a guideline)
    - Suggested structure for midterm report:
        - What is the hypothesis? Or What is the question your project focuses on?
        - Literature review. How have researchers addressed this question before? Why is this question important? Rule of thumb: discuss the project in the context of 5-10 relevant papers that you have read.
        - Break down your project into steps. Explain what experiments you will be running. A diagram, flowchart, or list of intermediate aims, is great here.
        - For each experiment:
            - What dataset(s) will you use? Is it public? Do you have the dataset? If not, how are you going to get access / prepare the dataset?
            - What models will you be using? How are you planning to train the models? Will you be building on code from GitHub? What code base will you be using?
            - How will you measure your results? What evaluation metric(s) will you use? Are these metrics standard? Do you have code for them or how are you planning to implement them? What are relevant benchmarks?
            - What constitutes success in this project?
            - How would you interpret the results?
        - What are the 1-2 key papers that you will be relying on?
        - Do you foresee any challenges or stumbling blocks? How do you plan to address them? Identify challenges early so that we can help you!
        - Preliminary progress.
            - What have you done so far?
            - Are there any formatting issues with the dataset? Do you have enough data?
            - Will you have enough computational resources?
            - What have you trained so far?
            - What are the preliminary results?
            - Saying "I downloaded data" or "I downloaded code" is not going to get you far in the midterm report. We are looking for initial attempts and a clear delineation of the plan ahead.
            - What are the next immediate steps?

Deliverable 4: Check-in before final
- Credit: 10 points
- Due: Friday 04/08/2025, noon, ET
- Goals:
    - Ensuring progress was made on steps identified in midterm report

- Identifying potential pitfalls in experimental design early on is of paramount importance for a successful project
- Ensuring students do not come one day before the final deadline with things that are not working.
- Answer questions, help students move along with their projects. Major issues should have been identified by now.
- To Do:
    - Submit video of a 5-min presentation on progress from mid-term proposal
    - Demonstrate what has been done with code and figures
    - Results need not be final at this stage but we are expecting to see figures with results
    - What issues have you identified?
    - How are you planning to address those issues?
    - What remains to be done?
    - What is the plan from here to the final?

Deliverable 5: Final project presentation
- Credit: 5 points
- <mark>Due: Tuesday 05/06/2025, noon, ET</mark>

Deliverable 6: Final project report
- Credit: 50 points
- <mark>Due: Tuesday 05/13/2025, noon, ET</mark>
- Final Deliverables:
    - Project report
    - Link to code (e.g., Github repository)
    - Suggested length: 6-8 pages
    - 5-min video walking through the project
    - Extra Credit: Demos
    - We will have an extra office hour session on how to write a good final report and will go over the steps below:
    - Suggested structure for the final report
        - Hypothesis/Question
        - Brief literature review.
        - Methods and steps taken with links to code. Describe which code YOU wrote, and which code was taken from other sources (include citations). Describe datasets that you have collected and which ones were taken from other sources (include citations). Cite key papers that your work relies on.
        - Describe your results. The results should include figures documenting the observations, performance, challenges, etc.
        - Discuss the results and their implications