

Assignment 1

Note: This assignment is originally from the EECS 498-007/598-005 course at the University of Michigan.

In this assignment, you will begin by familiarizing yourself with [PyTorch](#) using [Google Colab](#). You'll then practice building a simple image classification pipeline using the k-Nearest Neighbor (kNN) algorithm. The key objectives of this assignment are:

- Develop proficiency with PyTorch tensors
- Gain experience using Google Colab notebooks
- Understand the basic image classification pipeline and the data-driven approach (training and prediction stages)
- Learn the concept of train/validation/test splits and the role of validation data in hyperparameter tuning
- Implement and apply a k-Nearest Neighbor (kNN) classifier

Due Date: Friday, Oct 4, at 11:59 PM **(No extensions will be granted)**

Q1: PyTorch 101 (60 points)

The `pytorch101.ipynb` notebook will guide you through the basics of working with tensors in PyTorch. You'll be required to write your code in the accompanying `pytorch101.py` file.

Q2: k-Nearest Neighbor classifier (40 points)

The `knn.ipynb` notebook will walk you through implementing a kNN classifier. Write your implementation in the corresponding `knn.py` file.

Steps

1. Download the zipped assignment file

Click [here](#) to download the starter code. You can also access the starter code through Cybercampus.

2. Unzip all and open the Colab file from the Drive

Unzip the downloaded folder, and upload the contents to your Google Drive. To open the `.ipynb` notebook files in Google Colab, right-click on the files in Drive and select "Open with Google Colab". No installation is required. For more information on using Colab, please see our [Colab tutorial](#).

3. Open your corresponding *.py from Google Colab and work on the assignment

Once your Colab notebook is open, you can edit the corresponding `.py` files within Colab. We recommend keeping the notebook and `.py` files side by side for easier reference. Work through the notebook by executing the cells and implementing the corresponding code in the `.py` file as instructed. You can save your progress directly to Google Drive by selecting "File" -> "Save," allowing you to resume later.

While working on the assignment, keep the following in mind:

- The notebook and the python file have clearly marked blocks where you are expected to write code. **Do not write or modify any code outside of these blocks.**
- **Do not add or delete cells from the notebook.** You may add new cells to perform scratch computations, but you should delete them before submitting your work.
- **Run all cells, and do not clear out the outputs, before submitting.** You will only get credit for code that has been run.

4. Download and Compress Your Work

Once you complete the notebooks, download the relevant files and compress them into a single `.zip` file. Name the file using the format: `{student_id}_A1.zip`. Make sure your `.zip` file contains your most up-to-date edits. The `.zip` file should include `pytorch101.ipynb`, `knn.ipynb`, `pytorch101.py`, `knn.py` for this assignment.

5. Submit your zip file to Cybercampus

Submit your compressed `.zip` file on Cybercampus. Ensure your `.ipynb` files include all outputs.