

Assignment1: MLPs and Backpropagation

Due on November 9, 2025 (23:59:59)

Welcome

Welcome to comp541!

The main goal of this practical is to make you understand the basics of neural network design and training, and you will also get familiar with Facebook's Pytorch deep learning framework. In this practical you will use the GloVe and then utilize the word embeddings for sentiment classification using the DAN approach.

Files

- `assignment1.ipynb`: Contains all of the coding questions, and will automatically generate and display results for you after completing each question.
- `env.yml`: Create your working environment.

Set-up

We'll be using Python throughout the course. While Google Colab is a nice environment for this assignment, it is not mandatory to use it, and you can do your homework in your existing environments.

If you've got a good Python setup already, great!, in that case, you do not have to follow our instructions for environment set-up. But make sure that it is at least Python version 3.5. If not, the easiest thing to do is to make sure you have at least 3GB free on your computer and then to head over to <https://www.anaconda.com/download/> and install the Python 3 version of Anaconda. It will work on any operating system.

After you have installed conda, close any open terminals you might have. Then open a new terminal and run the following command:

Step1

Create an environment with dependencies specified in `env.yml`:

```
conda env create -f env.yml
```

Step2

Activate the new environment:

```
conda activate comp541
```

Step3

Install the specific versions of torch and torchtext:

```
pip install torch==1.9.0
pip install torchtext==0.10.0
```

Step4

Inside the new environment, install IPython kernel so we can use this environment in jupyter notebook:

```
python -m ipykernel install --user --name comp541
```

Step5

Homework 1 (only) is a Jupyter Notebook. With the above done you should be able to get underway by typing:

```
jupyter notebook assignment1.ipynb
```

Step6

To make sure we are using the right environment, go to the toolbar of `assignment1.ipynb`, click on **Kernel** → **Change kernel**, you should see and select `comp541` in the drop-down menu.

Step7

To deactivate an active environment, use

```
conda deactivate
```

What to submit

1. Click the Save button at the top of the Jupyter Notebook.
 2. Select **Cell** → **All Output** → **Clear**. This will clear all the outputs from all cells (but will keep the content of all cells).
 3. Select **Cell** → **Run All**. This will run all the cells in order, and will take several minutes.
 4. You have two options for the submission. You need to either submit your final `.ipynb` notebook, or its “pdf” version. Note that in all cases, we expect you to put everything that we asked for (codes, outputs, written answers, visual results etc.) in that single file.
- A: If you choose to submit a pdf, once you’ve rerun everything, select **File** → **Download as** → **PDF via LaTeX** (If you have trouble using “PDF via LaTeX”, you can also save the webpage as pdf. Make sure all your solutions especially the coding parts are displayed in the pdf, it’s okay if the provided codes get cut off and go into the next page because lines are not wrapped in code cells). Look at the PDF file and make sure all your solutions are there, displayed correctly. NOTE: If you have any problems with this way of extracting and downloading the PDF, you are free to use ANY tool to make it work, as long as you are able to provide a usual PDF with all the requirements formatted nicely in it.
- B: If you choose to submit the notebook itself, download a `.ipynb` version of your notebook while making sure that its all-comprehensive and self-contained.
5. Please name your files as `username_assignment1.ipynb` or `username_assignment1.pdf`.
 6. Submit your work to Learnhub by the deadline.