Course: Deep Learning
Assignment 5

Deadline: 10:00 am, 19 Nov, 2024

Objective:

In this assignment, you will implement a transformer model for text classification. Your task is to build a model that categorizes text samples into specific classes, allowing you to explore and understand the transformer architecture in depth.

Assignment Outline:

1. **Task:**
    - Your primary objective is to classify text samples from a dataset into predefined categories using a transformer model.
2. **Dataset:**
    - Use the AG News dataset, which is available in both `torchtext` and Kaggle [Link]. This dataset has four categories: World, Sports, Business, and Sci/Tech.
    - You will be given labeled text samples for training and testing, which will allow you to evaluate your model's ability to classify new, unseen samples.
3. **Evaluation:** Test the model on a held-out test set. Report metrics such as accuracy, precision, and recall to assess its performance.
4. **Expected Deliverables:**
    - **Code:** Submit a Jupyter Notebook or Python script containing the complete code for data loading, model training, validation, and testing.
    - **Report:** Write a brief report (3-5 pages) describing your approach, any challenges you faced, and the final performance of your model. Include any key observations or analysis you found noteworthy.
5. **Additional Guidelines:**

- **Evaluation Metrics:** Ensure that you report the accuracy, precision, and recall for your model. These metrics will help evaluate how well your model performs across the different categories.

Optional Challenges (for extra credit):

1. **Hyperparameter Tuning:** Experiment with different hyperparameters, such as learning rates and batch sizes, to see if you can improve model performance.
2. **Visualization:** Include visualizations showing training/validation loss and accuracy over epochs. This will help illustrate how the model's performance changes with each epoch.

Note:

- **Students will be rewarded extra for solving bonus questions, thorough experimentation and insightful analysis based on the results and graphs they produce.**

Report should be in PDF form and report by a team should also include the observations about the results of studies.

Instruction:

Upload all your codes(.ipynb file) and reports(.pdf file) in a single zip file.

- **Give the name of the folder as Group_Assignment5 Example: Group01_Assignment5**
- **Give the name of the zip file as Group_Assignment5.zip Example: Group01_Assignment5.zip**

We will not accept the submission if you don't follow the above instructions