AIL721: Deep Learning (Semester II, AY 2024 - 2025)

Assignment 3

Date of release: 18th March & **Last date:** 7th April 2025 [mid night].

1. You are free to discuss the assignment problems with other students in the class. But all your answers/-codes should be produced independently without looking at/referring to anyone else's answers/codes.
2. The submission directory should contain a report in .pdf format (answers/ derivations and results) and code. You should zip your directory and name the resulting file as "yourentrynumber-firstname-lastname.zip".
3. You have to submit code and report on moodle.
4. Office hours: Wed 3-5 pm, Bharti 319.

Deep Learning for Natural Language Processing [2.5 + 2.5 = 5 points]

Given a multi-category classification dataset (attached 'Datasets' directory):

a. Design a neural architecture that combines CNN and LSTM (or its variants) to solve the multi-category classification problem. You may explore whether the use of a self-attention mechanism at the output and/or dynamic meta-embedding at the input improves the performance of the neural architecture.

b. Implement a Transformer-based text encoding model. You are expected to analyze its performance with respect to the number of encoder blocks and the effect of including or excluding positional embeddings.

Both training test datasets are available to you in separate files. Report the micro-average F1 score of the designed classifier on the test set. Also, the rationale for the **choice of architecture and its parameters should be mentioned**.