

# CS-5007 Deep Learning

## Assignment 6 - RNN, LSTM and GRU

April 20, 2021

### Instructions

1. This is a GRADED assignment of total 5 points.
2. Submit the assignment as a single notebook(\*.ipynb).
3. Follow the given naming format strictly: < *name\_roll* >\_Assignment\_6.ipynb.
4. Try to solve each sub question in a new cell wherever possible. This improves the notebook's readability.
5. Please note down your observations in text blocks below the corresponding code blocks.
6. Mention and justify your assumptions if any.
7. You can use all the packages used in the demo. And these are sufficiently enough.
8. Maintain separate cells each for loaded libraries, configuration data, utility functions, main code block and so on.
9. You don't have a separate report, so try to present your notebooks in a more readable way.

### Introduction

- This is a text classification task using RNN, LSTM and GRU.
- The main goal is to classify the movie reviews(in the form of a sentence) into positive or negative.

### Datasets

1. Dataset 1: <https://drive.google.com/file/d/1FbPIIE56GpQrzKCHfXtg6Rd7PVkJJe-Qa/view?usp=sharing>
  - Contains reviews and associated labels(0 for negative and 1 for positive) in a single file.
2. Dataset 2: <https://drive.google.com/drive/folders/1slkSqOneQzfwt3dhrATATG5qW9nEfxho?usp=sharing>
  - Contains positive and negative reviews in .pos and .neg files respectively.

## **Task 1 (4 marks)**

Perform the following tasks for both datasets.

1. Clean the data and do necessary pre-processing steps.
2. Split the dataset into training and testing sets and do all comparison using the performance on test data.
3. Use some method to perform word embedding.
4. Implement RNN from scratch.
5. Using necessary dense layers along with the RNN, classify the movie reviews into positive or negative, note the accuracy.
6. Implement inbuilt RNN in tensorflow and add the same dense layers as above, compare the accuracy with above model. Do a reasoning for the changes if any.
7. Implement inbuilt LSTM in tensorflow and add the same layers as above.
8. Implement inbuilt GRU in tensorflow and add the same layers as above.
9. Compare accuracy for the above models and do a reasoning.

## **Task 2 (1 mark)**

1. Combine the above two datasets to form a larger one.
2. Implement RNN, LSTM and GRU from tensorflow and tabulate the results.