Deep Learning (CS F425)

Assignment – 1

Submission Time & Date: 2359hrs on 29th Oct 2021
Max Marks: 20

General Instructions:

This assignment is a coding project and is expected to be done in groups. Each group can contain at most four members. Make sure that all members in the group are registered to this course.

Refrain from directly copying codes/snippets from other groups or the internet as all codes will be put through a plagiarism check.

All deliverable items should be put together in a single .zip file. Rename this file as A1_<id-of-first-member>_<id-of-second-member>_<id-of-third-member> before submission.

Submit the zip file on CMS on or before the aforementioned deadline. Please note that this is a hard deadline and no extensions/exemptions will be given. The demos for this assignment will be held on a later date which shall be conveyed to you.

All group members are expected to be present during the demo.

Problem Statement:

- ✓ Building deep learning models requires taking design and architectural decisions which play an essential part in the performance of the resulting model.

- ✓ Build at least 16 deep learning models by taking reasonable design and architectural decisions for Fashion MNIST dataset.

- ✓ Consider the following hyperparameters for building these models:
  - Activation functions: Sigmoid, Tanh, ReLU
  - Loss functions: Categorical Cross-Entropy, KL Divergence
  - Number of hidden layers: 1, 2, 3, ..., 10
  - Number of nodes in hidden layer: 16, 32, 64, ..., 1024

- ✓ Perform a comparative study of these models and explain the superior/medium/inferior performance of these models.

- ✓ The report should present each model with design & architectural decisions and how the underlying design decisions/ hyper parameters impact the models. The results and all other details should be discussed in the report.

- ✓ The report should include relevant tables and plots such as accuracy vs epochs and loss vs epochs. You may also consider number of parameters and training time for each model to aid in your analysis.

Whom to contact for queries:

Please contact Mr.Prathyush Banerjee (f20180312@hyderabad.bits-pilani.ac.in)for any queries.

Link to the dataset:

Fashion MNIST dataset can be downloaded from the following link:
https://www.kaggle.com/zalando-research/fashionmnist