

Assignment 3 – CS 6304 Deep Learning

Purpose: The purpose of this assignment is to build and train multilayer fully connected dense layer neural network with different techniques to prevent overfitting.

What to submit: Submit Jupiter notebook that contains code and proper comments. You do not need to submit the data sets.

Refer to the **Overfitting.ipynb** jupyter notebook under week 2. This notebook illustrates how to build and train a multi-layer perceptron to recognize handwritten digits (0, 1, 2, ..., 9) using “drop out” technique to prevent overfitting.

In this assignment, you will use the same data sets used in the same notebook, but you will experiment other techniques to prevent overfitting.

In the notebook, you are already given three four model architectures

- Model with L1 regularization
- Model with L2 regularization
- Model with L1L2 regularization
- Model with Batch normalization

Train these four models (early stopping should be applied) using the same training parameters used with the “dropout” technique in the notebook. Report predictions on the testing set from these four models.

Plot the training/validation loss and accuracy vs epochs from the four training procedures.

[25 points for successful training and plot for each model]