# PMDS603P Deep Learning Lab Assessment 3

September 2025

## 1 Work to do today

Note: Make a single PDF file of the work you are doing in a Jupyter notebook. Upload with the proper format. Please mention your name and roll no properly with the Experiment number on the first page of your submission.

**Question1.** Use the MNIST dataset and do necessary pre-processing, and split the data into training, validation, and testing sets. Create a new ANN model with appropriate hidden layers and output layer neurons. Choose appropriate activation functions. Choose the error function appropriately and use SGD as the optimizer. Include early stopping technique in your model and run the model for 500 epochs and report the Performance.

**Question 2:** Now refit the model with three learning rate schedulers, linear, polynomialdecay and exponentialdecay and report the answers. The fitting should be done with early stopping on.

**Question 3:** Optimizer Comparison

Report the best optimizer that would result in the best performance for the above models. Try at least three to four optimizers (e.g., SGD with momentum, RMSprop, Adam). Train the same model architecture with each optimizer. Compare their performances. Report which optimizer gives the best results.