**Lab Exercises-10**

**1.** Use MNIST dataset. Create multi-layer neural network model using sklearn package. Tune the hyperparameters in order increase the accuracy of test data. Also check the overfitting of your model.

2. Use iris dataset. Do the pre-processing of the dataset if required. Create Multi-layer Perceptron to predict the flower category. Check for the overfitting of your model.

3. Use wine\_quality dataset. Do the pre-processing of the dataset if required. Create classification model using multi-layers perceptron. Check for the overfitting of your model.

4. Use digits dataset. Implement a knn classifier, a SVM classifier and a neural network classifier for this dataset. Compare the results and performance of these three classifiers.

5. Dataset to be used: MNIST (English handwritten numerals) (you can download the dataset from kaggle [MNIST A-Z dataset](https://www.kaggle.com/sachinpatel21/az-handwritten-alphabets-in-csv-format). Create different classification models using classifiers such as KNN, SVM, DT, ANN. Provide information on the classifier settings(e.g: KNN: value of k for kNN classifier; SVM: kernel and other parameters used in SVM classifier; DT: depth and leaf nodes; ANN: activation function, loss function, etc.). Discuss the experimental results for these different classifiers. Also check for overfitting of the models.