INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI

EE6021: Deep Learning Theory & Applications

Programming Assignment -1 **Date : 03/08/2019**

Unsupervised Classification on MNIST and CIFAR-10 datasets

1) Download the startup.zip, which contain "NN_Classifier.py" file for loading partial **MNIST(grayscale)** dataset of 1000 train and 100 test images and corresponding labels accross 10 different classes. Write your code only in Python3 (with PyTorch library)
   i. To Convert each image into a 784 dimensional feature vector (Intensity of each pixel) and apply "K - Nearest Neighbour (K-NN)" algorithm for Classification with K = 1 and repeat it for K=3 and 5.
   ii. To find the "Confusion Matrix" for each classification task (Use *sklearn* library) and measure the accuracy.
2) Repeat the experiment-(1) with **CIFAR10(colour)** dataset by converting each image into a 768 (=256x3) dimensional feature vector (Histogram of pixel Intensity values).
3) Summarize your approach, results and inferences in a Report using Latex.

Note : You are allowed to use any similarity/distance measure to find the nearest neighbour.

➢ ***Specific Instructions:***

- Use Linux based "Ubuntu 16.04 or later" Operating System only. You are encouraged to use free "Google Colaboratory", if you don't have a Ubuntu system.
- Upload Assignment into your own GitHub profile with comments in the code and proper README file. Mention this link in the report.
- DeadLine for submission : **18 Aug 2019, 11:59 PM.**