Assignment 4 EAS 595

Deadline: April 20, 2022 11:59 PM

- **Do not copy** and paste or cheat. Assignments are for your learning not just to solve by copying.
- **Prepare 5** minutes to demo video explaining or code or observation. In any case video should not be longer than 7 minutes. The video is for 5 points.
- Naming convention - ubitname_a4.zip (ex: sachinge_a4.zip).
- **Total : 50 points**

Use the CIFAR-10 dataset for the questions. Perform the image classification using the dataset based on the network configuration defined in the individual part.
(train_images, train_labels), (test_images, test_labels) = datasets.cifar10.load_data()

Q1. Built the AI classifiers we have studied so far (such as Neural network, logistic regression, CNN, and K-nearest neighbor (KNN)) to perform the classification on the dataset. Make sure you are not using a testing set in the training.

You are free to choose hyper-parameters of the classifiers such as K in KNN, number of layers in NN, number of filters in CNN.

Q2. Prepare the report describing the performance of each classifier in terms of multiple evaluation metrics such as accuracy, confusion matrix, Precision/Recall, etc (whichever applicable)

Q3. Find out the classification difference among different classifiers. For example, find at least 10 samples which are correctly (and incorrectly) classified by each classifier, Samples classified by say classifier ‘X’ but misclassified by others, for example, samples classified by KNN by misclassified by others.

By looking at the samples can you identify any reason about such phenomena like the images are complex that is why misclassified, or images are noisy, good quality that's why lead to classification or misclassification. Maybe for that, you need to find different representative images, not just the same kind of images of one class.