Assignment 6 EAS 595 **Deadline: May 5, 2022**

- **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. Naming convention - ubitname_a6.zip (ex: sachinge_a6.zip)
- There are **no late days** for this assignment, i..e, the deadline is a hard deadline.

Q1. Use the k-means algorithm to cluster the following 8 examples into 3 clusters using pen and paper. In place of pen and paper, you can write the code without using **any** in-built function.

A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2), A8=(4,9)

Suppose that the initial centers of each cluster are A1, A4, and A7. Run the k-means algorithm using Euclidean and L1 distance until convergence or minimum 3 epochs. For both the distance metrics, at the end of each epoch show:

a) The new clusters (i.e. the examples belonging to each cluster)
b) The centers of the new clusters
c) Distances of each point with the seeds. You can draw a matrix of size 3*8.

Q2. Apply RNN and LSTM for the stock price prediction. Compare and contrast their performance. You can optimize the architectures in terms of hyper-parameters such as no. of layers, epochs, learning rate, etc for better understanding and report your observations. Report your findings such as which architecture is best and why, what happened when you have changed the hyper-parameters, accuracy, error, etc. You are free to use any dataset of decent size of your choice.

https://medium.com/neuronio/predicting-stock-prices-with-lstm-349f5a0974d4