Machine Learning Challenges

Welcome to the Machine learning challenge of Motor AI. Before you start planning to code, give yourself some time and don't feel lazy to enlighten yourself with some theoretical and mathematical backgrounds of the architectures you're asked to use. It's a great idea if you can play around with different hyperparameters and show your experiments with some good visualization.

For each problem, there is a minimum expectation of result that you must achieve. The coding language should be in python and the dataset will be there in your email attachment. You can use Keras or Tensorflow as deep learning library. The final solution to each problem should be documented (Microsoft word or Google docs) and final source code (well commented) should be in a github repository.

****Important:** For all dataset, the first column is the label and the rest are features or time points (Both of the datasets are time series datasets)

Problem 1:
Convolutional neural networks have been really popular in different domains like Images, Time series etc. Use the 'ChlorineConcentration' dataset from the attachment and design a classifier using CNN. The training and test samples ratio should be 70% and 30% respectively. The minimum expected test accuracy is 90%.
Feel free to try with different hyperparameters and include all the insights in your documentation.

Problem 2:
Autoencoder is a very popular deep learning model for unsupervised learning. The most amazing fact about Autoencoder is, it has capability of representing data in low dimensional space and extracting interesting patterns. Use Autoencoder to perform clustering over 'ElectricDevices' dataset and the minimum expectation is to bring good results than any traditional clustering algorithm (preferrably KMeans). Take a look at the paper link below and you can use the architecture proposed in the paper (You can use other architecture if you are not convinced by this paper, don't forget to cite the paper in your document).

Paper link:
http://www.nlpr.ia.ac.cn/english/irds/People/lwang/M-MCG_EN/research/CFS-CIAPR13/paper.pdf

Deadline:
Friday 2nd November, within 11:59 pm

---- Good Luck ----