Assignment 2 (Option 2) Due on November 20 (Tuesday) 5:30 PM

1. Explore Different unsupervised pretraining approaches in prediction /classification/ clustering (preferably prediction). Example:
    a. Deep Belief network/
    b. Deep Autoencoder/
    c. Any other
2. **Model 1:** Pick any one approach from above and apply it to your problem. Why you choose this model? Choose your own dataset from any online repository.

    (Optional – for extra credit)
3. **Model 2:** Apply any improvement to Model 1 from the recent literature. Specify in what aspect the improvement is done. Example:
    a. Improved building block like Contractive autoencoder
    b. Improved training approach like Matrix variate Gaussian Restricted Boltzmann
    c. Inclusion of denoising method
    d. Any other improvement
4. Show Improvement in model 2 from model 1 with graphical representation. Example:
    a. In terms of weights/
    b. In terms of learned features/
    c. In terms of Resource consumption/
    d. In terms of error/time/
    e. In terms of regularisation/
    f. In terms of inputs requirement/
    g. Any other

    .

Note:

1. Implementation should be in python (Suggestion: Tensorflow/Keras).
2. Carefully consider the data set (preferably complex) to show more significant result.
3. Model should be validated with respect to the problem considered.
4. Suggested Materials to start with but not restricted:
    a. https://metacademy.org/graphs/concepts/unsupervised_pre_training
    b. Why does unsupervised pre-training help deep learning?. *Journal of Machine Learning Research*.

For this assignment contact the TA: Pallabi Saikia (pallabi.s@iitg.ac.in)