Indian Institute of Technology Jodhpur
Deep Learning
Programming Assignment 3

Due Date: July 23, 2023, Max Marks: 50

Instructions:

- Attempt any two problems.
- Prepare a readme file mentioning how to run your code.
- Zip all your codes and trained models into a single file and name it by your roll number.
- Copying from the Internet and your classmates is strictly prohibited. If found, you will be awarded -50 marks for the assignment.

1. Implement the Sparse auto-encoders (AE). Use the MNIST digit dataset for training your network. Perform the k-means clustering on the embeddings. To evaluate the performance of the k-means algorithm, use the available labels in the dataset.
   Dataset: http://yann.lecun.com/exdb/mnist/
   [25 Marks]

2. Implement variational Auto-encoders. Use the Frey Face dataset to train your network. Sample points from the learned distribution by varying different latent variables to show that your network has learned meaningful latent variables. Set the embedding vector size to 20.
   Dataset: https://cs.nyu.edu/~roweis/data/frey_rawface.mat
   [25 Marks]

3. Implement GAN and use the Frey Face dataset to train your network. Generate new samples and comment on the quality of the faces.
   Dataset: https://cs.nyu.edu/~roweis/data/frey_rawface.mat
   [25 Marks]