AI & ML Practice Assignment

27th October 2020

Hashing Technique & Principal Component Analysis (PCA)

1. Consider the entire Yale Faces dataset.

2. Obtain the transformation matrix $\boldsymbol{Q}$ and mean vector $\boldsymbol{\mu}$ by performing Principal Component analysis on the dataset.

3. Obtain the feature vector for every training set by using the transformation $v = {}_{Q}{}^{T}(x - \mu)$.

4. Generate around 50 random vectors of dimension *n_dim*, where *n_dim* is the number of dimensions in v.

5. Generate **50-bit** hash representation of each of the feature vectors.

6. Calculate the **L1-**norm distance between the hash representation of a par- ticular feature vector with the hash representation of other feature vectors and sort the vectors based on the distance values.