Deep Learning For Computer Vision

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Aim:- To create a feature Matrix using LBP and to extract the K nearest neighbors when a query image is passed to the Feature Matrix.

Dataset Used:- Corel_1000 dataset is used in the assignment with partition of dataset into training_set and testing_set comprises of 900 and 100 images respectively with 10 distinct classes in training_set as well as testing_set.

- In training_ set each class consists of 90 images.
- In testing_set each class consists of 10 images,

Training:- In the training process all the 900 images are passed and each image feature is extracted using the LBP feature descriptor and the features of each image is stored in the Feature_Matrix.

Testing:-A query image is given, firstly the query image is converted into its corresponding feature vector, then this feature vector is passed onto the Feature Matrix and the **'query feature vector'** distance is compared with each feature vector of the **'Feature Matrix'** and the closest distance **'k'** images are displayed on the screen.

KNN Algorithm is used to find the euclidean distance between the images.

Precision:- is calculated using the formula

(Number of relevant retrieved images) / (Total number of retrieved images)

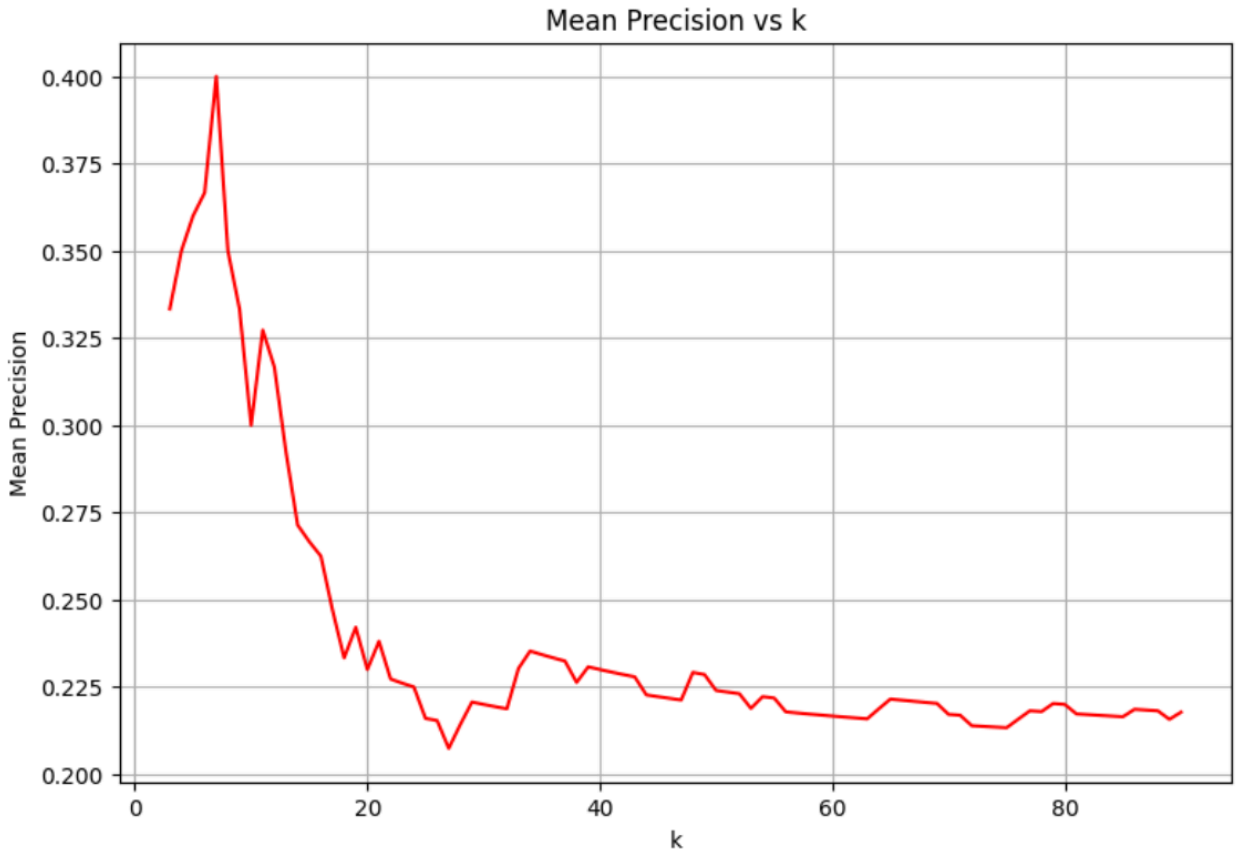
- Where **Total number of retrieved images** is equivalent to **'K'.**
- Where **Number of relevant retrieved** images is equivalent to the images that belong to the same class as of '**Query Image'.**

Recall:- is calculated using the formula

Number of relevant retrieved images) / (Total number of relevant images in the database)

- Where '**Number of relevant retrieved images'** is equivalent to the images that belong to the same class as of '**Query Image'.**

- Where '**Total number of relevant images in the database'** is equivalent to **'90'**



K value ranges from **[3,90]**

Observation:- By visualizing the graph , I inferred that when the value of K is small the precision is higher. As soon as the value of K is increased the precision decreases.

K is inversely proportional to Precision.

Recall can be measured when ‘K’ reaches 90.