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Subject : Supervised learning - Assignment 1

- At this assignment we classify digits using KNN model algorithm.
- Firstly, we split the MNIST dataset into a test and training dataset according to (1000,10000) 10000 for training dataset and the other for tested dataset.
- We divided each digit into 4-grids (2x2) grid.
- Then we got the centroid of each divided grid of each digit.
- We put each centroid(x,y) into a list to train and predict the model.

- We compared the KNN model with different K-parameter to get the optimal one :
    - At K = 3 → Accuracy of KNN model: **0.801**
    - At K = 8 → Accuracy of KNN model: **0.833**
    - At K = 12 → Accuracy of KNN model: **0.832**
    - At K = 100 → Accuracy of KNN model: **0.782**
    - At K = 1000 → Accuracy of KNN model: **0.659**
    - At K = 20 → Accuracy of KNN model: **0.822**
    - At K = 7 → Accuracy of KNN model: **0.824**
    - At K = 9 → Accuracy of KNN model: **0.826**

- So the best K-parameter to fit into the model and get highest accuracy according to the above statistics is at **K = 8** with accuracy **0.833**.