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Date : 04-Dec-2020

**[Class Exercise - 4]**

**COURSE Name: Data Science**

**COURSE CODE: CSC 3305, SEC: 01**

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**Question : What are the differences between K-NN and K-Means?**

**The basic difference between K-NN and K-Means are :**

1. K-NN is basically known as Supervised machine learning algorithm on contrary K-means is known as unsupervised machine learning algorithm.
2. K-NN is one kind of classification or regression machine learning algorithm on the other hand K-means is a clustering machine learning algorithm.
3. K-NN is a lazy learner while K-Means is an eager learner. An eager learner has a model fitting that means a training step, but a lazy learner does not have a training phase.
4. if all of the data have the same scale, K-NN can performs much better than K-means.

**How its work :**

**K-NN:** It works based on finding the distance between search ones and example ones in data. Then selecting the specified ones of the examples closest ones to the query, then make decision for the most frequent label for classification and average label for regression.

**K-Means:** It works based on splitting the given unknown data set, which has no information to identify the class, make into a fixed number (k) of clusters.

**Applications that normally apply the algorithm:**

**K-NN:** Recommendation System. For instance, Online Book Recommendation System, Shopee product recommendation system.

**K-Means:** Document clustering, Market segmentation, Image segmentation and Image compression.