**Prerequisites**

* Floyd-Warshall algorithm

Floyd-Warshall algorithm is used to find the shortest distances between all pairs of nodes in a graph. The way it works is that in order to find the shortest distance between the nodes *u* and *v,* it has to go through an intermediate node *k.* The idea is to consider each node from 1 to N as an intermediate node and try with every one of them.

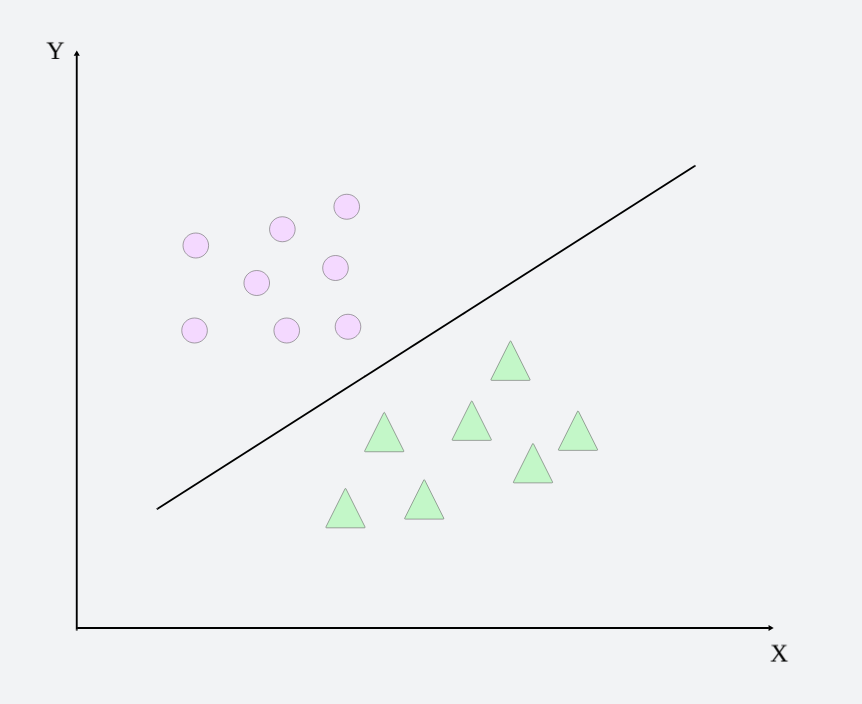
* K-nearest Neighbors or KNN

K-nearest neighbors’ or KNN classifier is a supervised machine learning classification algorithm which is used to locate clusters or groups of similar points. Its supervised nature is due to the fact that the labels for the training samples are already known and sorted. Whenever, a new sample point comes, the algorithm will classify it based on its nearest neighbors and will conclude that if *K* of its nearest neighbor have a particular label, then this new point must also have the same label.

The parameters required to judge the “nearness” of the neighbors is based on various distances such as Euclidean distance, Manhattan distance etc.

* Support Vector Machine or SVM

Support Vector Machine or SVM is a supervised machine learning regression and classification algorithm which works on the principle of dividing the space using a hyperplane. The type of hyperplane depends upon the number of features in consideration. If there are only 2 features then the hyperplane is a simple line (or curve). Similarly, if we have 3 features then the hyperplane is a plane. The objective of SVM is to keep the margin between the closest points of separate classes as large as possible. The hyperplane divides these classes into their respective labels.



* K-means Clustering

K-means Clustering is an unsupervised machine learning algorithm which clusters similar unlabeled data points together using various distances. Initially, it randomly assigns the point a cluster. After that the centroids of the clusters are found and then the point is reassigned to a cluster due to change in distance. This process is repeated several times and stops when no change takes place in cluster assignment.

