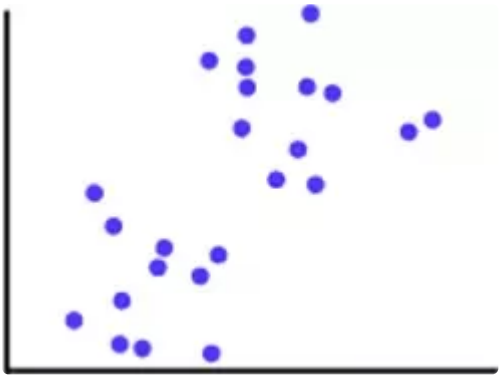
In machine learning, people often confused with k-means (k-means clustering) and KNN (k-Nearest Neighbors).

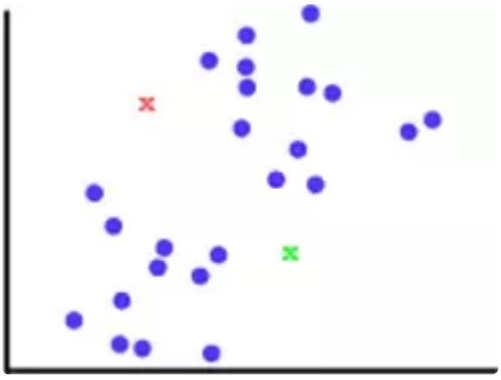
K-means is an unsupervised learning algorithm used for clustering problem whereas KNN is a supervised learning algorithm used for classification and regression problem. This is the basic difference between K-means and KNN algorithm.

How does K-means algorithm work?

In unsupervised learning, the data is not labeled so consider the unlabelled data. Our task is to group the data into two clusters.

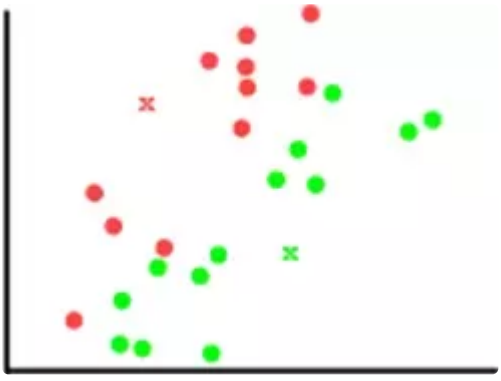


This is our data, the first thing we can do is to randomly initialize two points, called the cluster centroids.



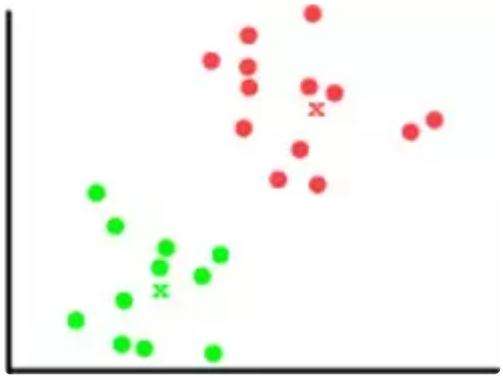
In k-means we do two things. First is a cluster assignment step and second is a move centroid step.

In the first step, algorithm goes to each of the data points and divide the points into respective classes, depending on whether it is closer to the red cluster centroid or green cluster centroid.



In the second step, we move the centroid step. We compute the mean of all the red points and move the red cluster centroid there. We do the same thing for green cluster.

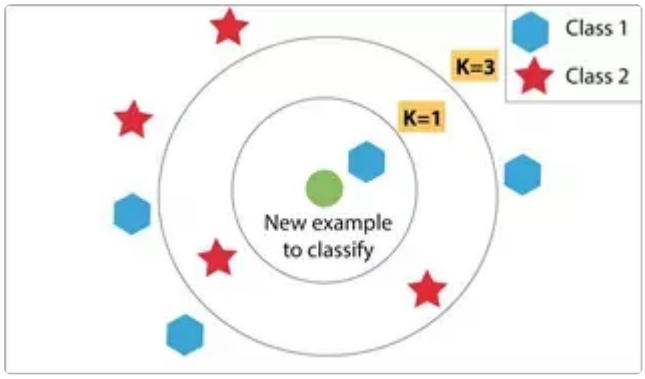
This is an iterative step so we do the above step till the cluster centroid will not move any further and the colors of the point will not change any further.



This is very layman explanation of how k-means works.

Now, let's see how KNN works.

KNN is a supervised learning algorithm which means training data is labeled. Consider the task of classifying a green circle between class 1 and class 2.



If we choose k=1, then green circle will go into class 1 as it is closer to the class 1. If K=3, then there are 'two' class 2 objects and 'one' class one object. So KNN will classify the green circle in class 2 as it forms the majority.