12. Is K sensitive to outliers?

ANS-   K-means clustering is an unsupervised learning algorithm which aims to partition n observations into k clusters in which each observation belongs to the cluster with the nearest centroid. The algorithm aims to minimize the squared Euclidean distances between the observation and the centroid of cluster to which it belongs.But sometime K-Means algorithm does not give best results. It is sensitive to outliers. An outlier is a point which is different from the rest of data points. Let us look at one method for finding outliers of univariate data (one dimensional).The lower quartile 'Q1' is median of first half of data. The upper quartile 'Q3' is median of second half of data. The interquartile range 'IQR' is difference of Q3 and Q1. An outlier is a point that is greater than (Q3 + 1.5*IQR) or lesser than (Q1–1.5*IQR)

13. Why is K means better?

ANS-It is very easy to implement it can Scales to large data sets.Guarantees convergence.it Can warm-start the positions of centroids.it will Easily adapts to new examples.

it can Generalizes to clusters of different shapes and sizes, such as elliptical clusters.

14. Is K means a deterministic algorithm?

ANS-cluster analysis aims to group a set of objects in such a way that objects in the same group (i.e. a cluster) are more similar   to each other than to those in other groups .k-means is a partitioning-based clustering algorithm. k-means method for clustering is an iterative process in which an initial partition of given k clusters is then improved by applying a search algorithm to the data. Simplifying, given a pre-defined number (k) of clusters, the algorithmbegins with an initial set of k cluster centers (i.e. the centroids).assigns objects to the closest centroids.recalculates centroids according to new memberships of the data points.he basic k-means clustering is based on a non-deterministic algorithm. This means that running the algorithm several times on the same data, could give different results. However, to ensure consistent results.