

UNSUPERVISED LEARNING

(Algorithms)

→ K-Means Clustering

Eg) Pizza Parlour Study

Instructs to make 3 pizza stations
→ Identifying the locations

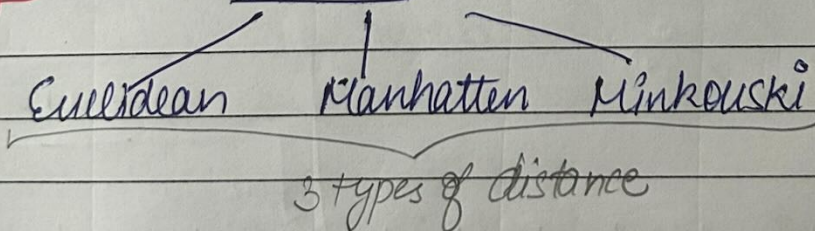
Machine smjhengi clusters ke through, jo k-means bnayega

- 1 cluster ki properties similar hogi
(similar properties isliye hogi, kyunki unka distance same hoi)

Step 1 - Initialise the centroids randomly

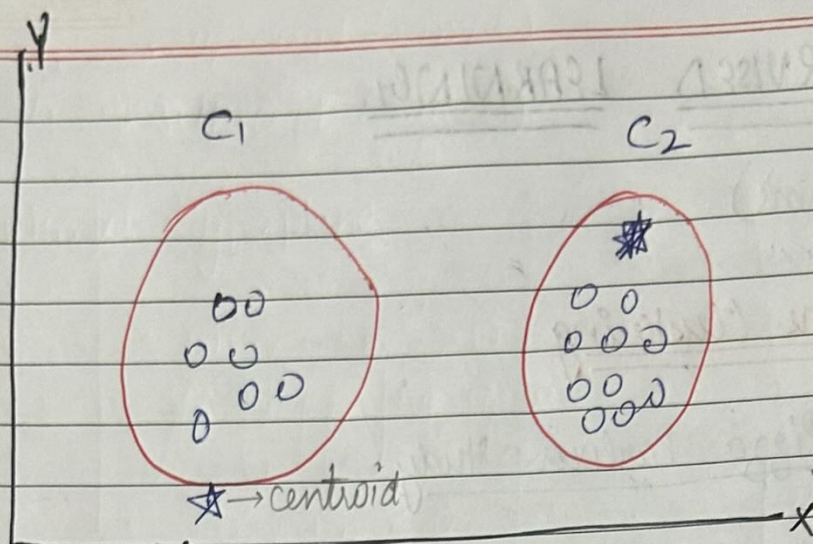
Step 2 -

Distances



13/2/23

- 1) Select an appropriate value of K which is the number of clusters or centroid
- 2) Select random centroid for each cluster
- 3) Assign each data point to its closet centroid
- 4) Adjust the centroid for the newly formed cluster
- 5) Repeat step 4 & 5 till all the data points are perfectly organised within a cluster space.

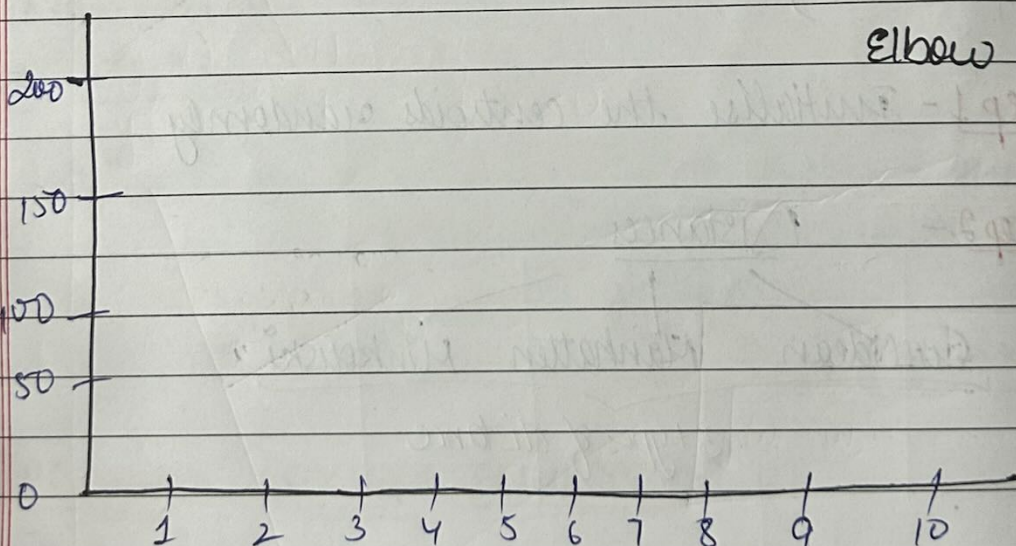


- 1.) Randomly initialise centroids
- 2.) Euclidean distance (points & centroids)
- 3.) Re-calculate centroids by finding mean

$$\Rightarrow (P_1, C_1) = 2$$

$$(P_1, C_2) = 7$$

jiska distance minimum hoga, us cluster ko woh point assign ho jayega.



Elbow Method

$$SS_1 = (C_1 - P_1)^2 + (C_1 - P_2)^2 + (C_1 - P_3)^2 + \dots + (C_1 - P_n)^2$$

$$SS_2 = (C_2 - P_{n+1})^2 + (C_2 - P_{n+2})^2 + (C_2 - P_1)^2$$

$$WCSS(C_{ij}) = \sum_{P_i \in C_j}^{P_m} \text{distance}(C_j, P_i)^2$$

\Rightarrow Evaluation Matrix for unsupervised learning \rightarrow Silhouette Coefficient