# Hierarichal Clustering



$K=3$

No Centroids
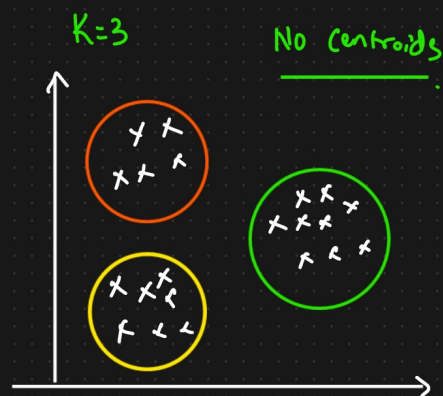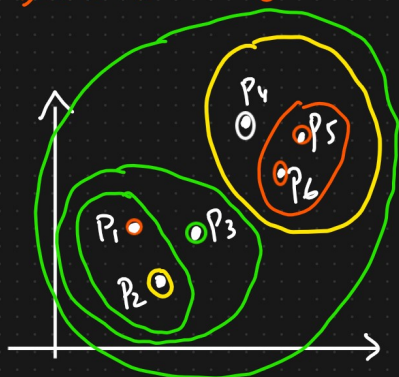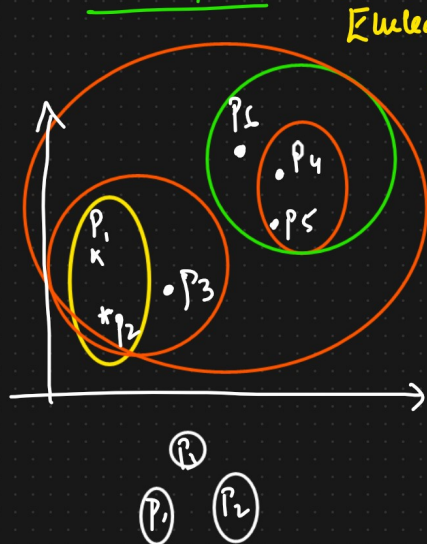
⇒ Hierarichal Clustering

## HC

① Agglomerative
② Divisive   ⇒ Geometric Intuition.



### Steps

① For each point intially will consider it as a Separate Cluster

② Find the nearest point and create a new Cluster

③ Keep on doing the same process until we get a Single Cluster

Dendogram

$K=3$   $K=2$   Agglomerative

No. of Clusters

Eucledian Distance

Euclidian Distance

$P_1, P_2, P_3, P_4, P_5, P_6$

Threshold

$K=2$

↑↑↑↑

$K=4$



$P_1, P_2, P_3$

$P_4, P_5, P_6$

$P_1, P_2$

$P_4, P_5$

$P_3$

Divisive

$P_1$  $P_2$  $P_3$  $P_4$  $P_5$  $P_6$
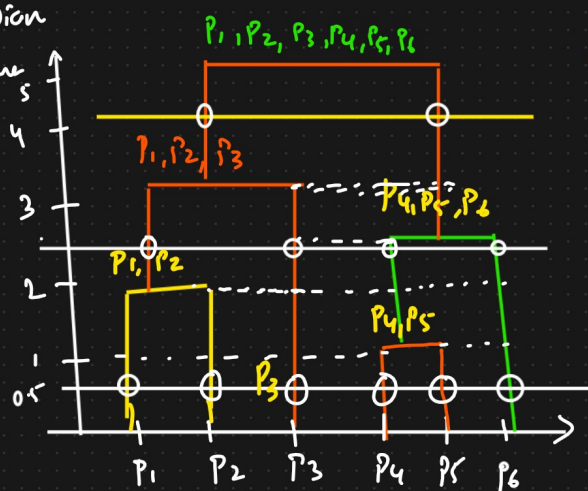
(K)    Select the longest vertical line such that }
       no horizontal line passes through it }

Threshold {Eucledian Distance}.