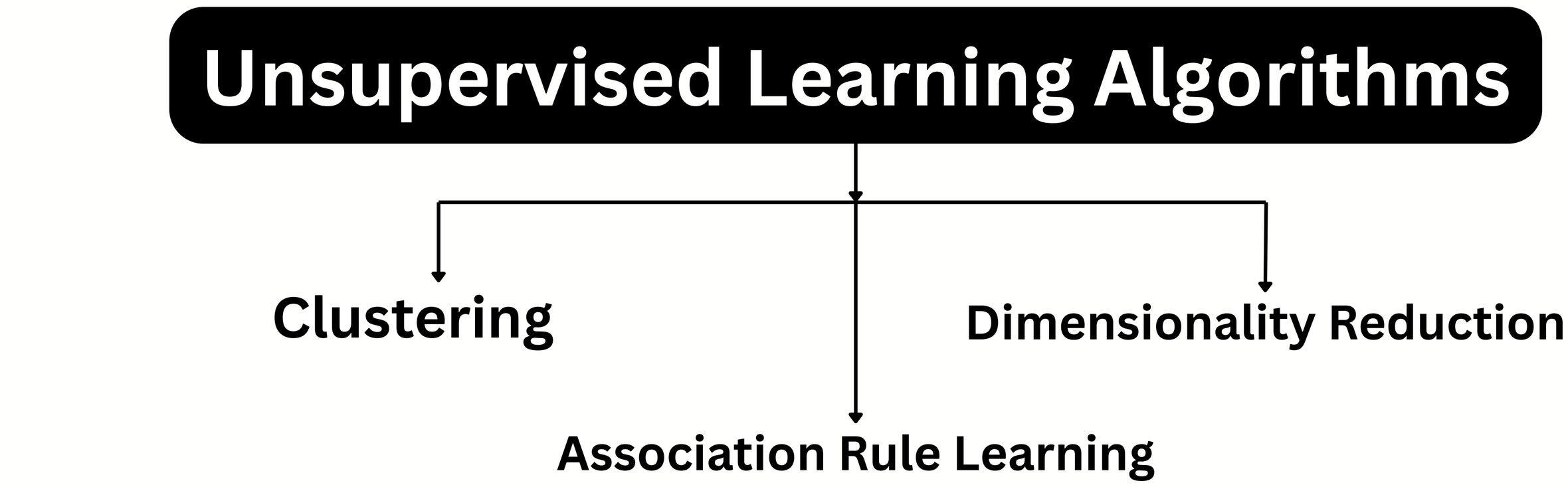
Unsupervised Learning

What is Unsupervised Learning?

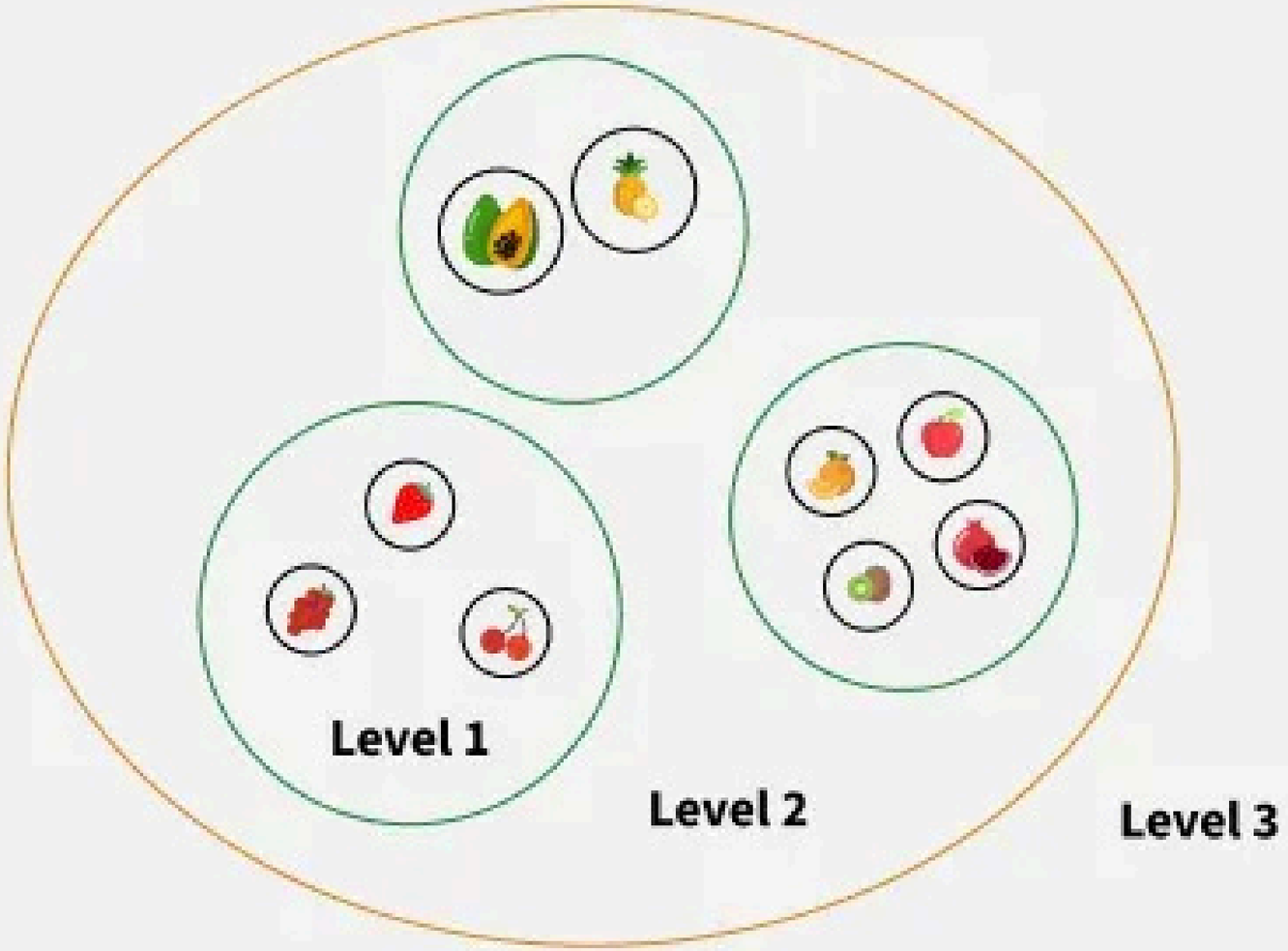
- Unsupervised learning is a type of machine learning where the algorithm learns patterns and structures from unlabeled data. In contrast to supervised learning, there are no explicit labels (targets) provided to the model. The goal is to infer the underlying structure of the data.

Unsupervised Learning Algorithms



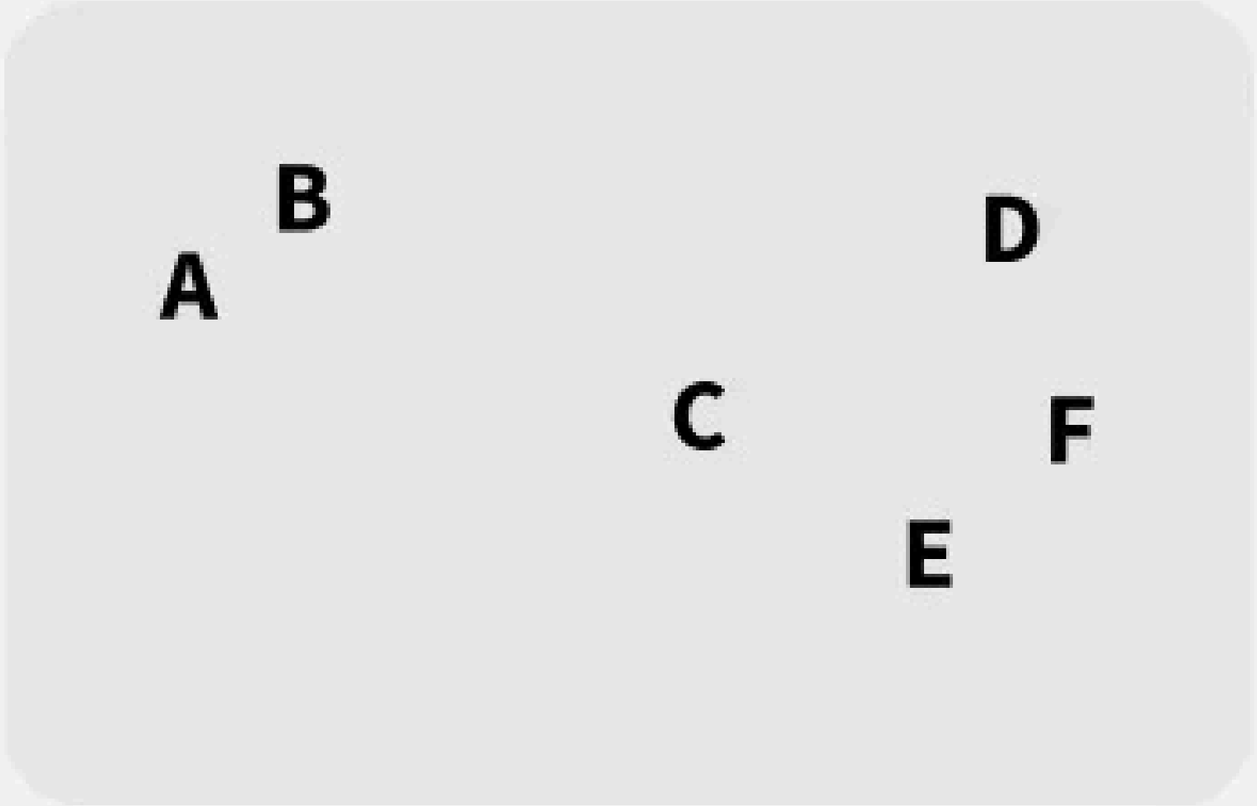
What is Hierarchical Clustering

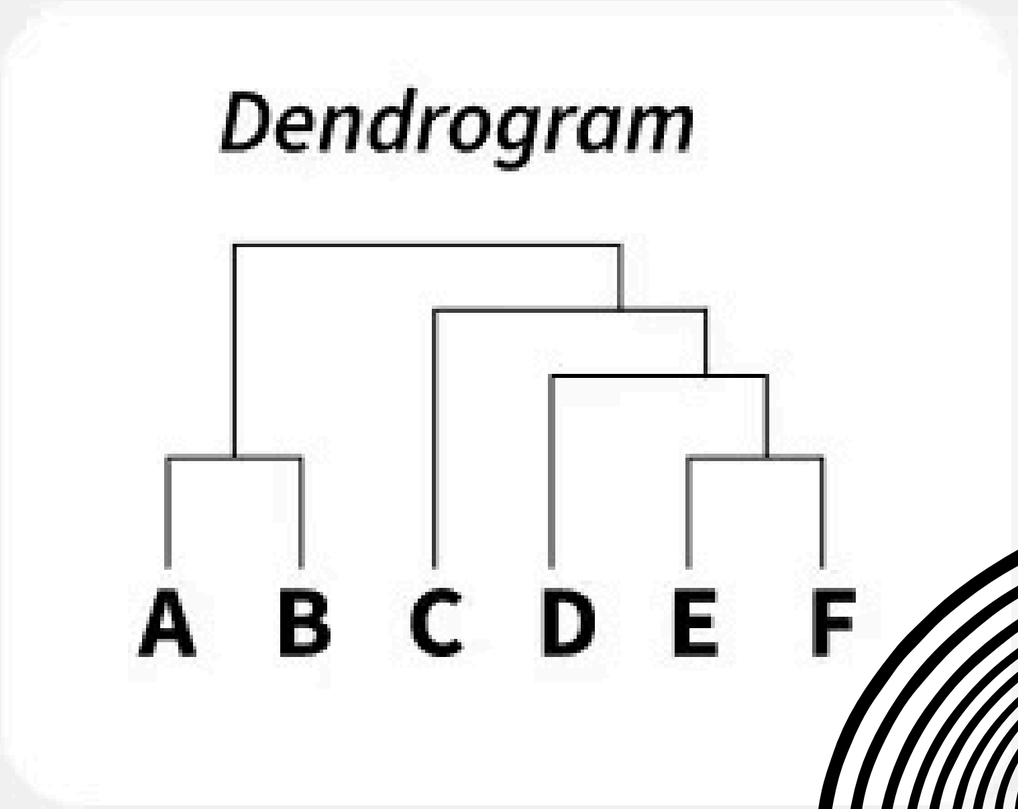
Hierarchical clustering is an unsupervised machine learning algorithm that groups data into a tree of nested clusters



What is a Dendrogram?

A **dendrogram** is a tree that shows how clusters are merged step-by-step.
We **cut** the dendrogram at a certain height to form final clusters.

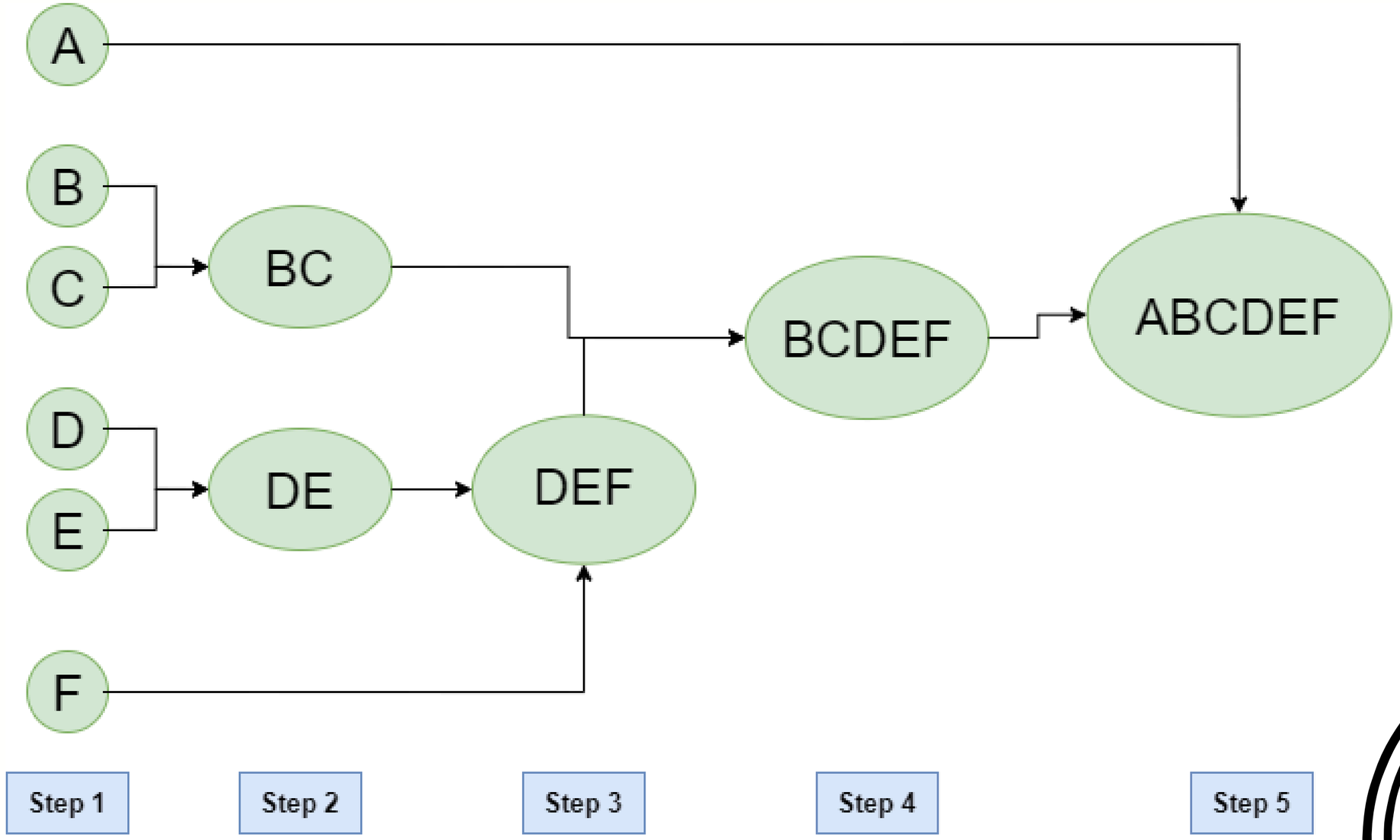




Types of Hierarchical Clustering

1. Agglomerative Clustering
2. Divisive clustering

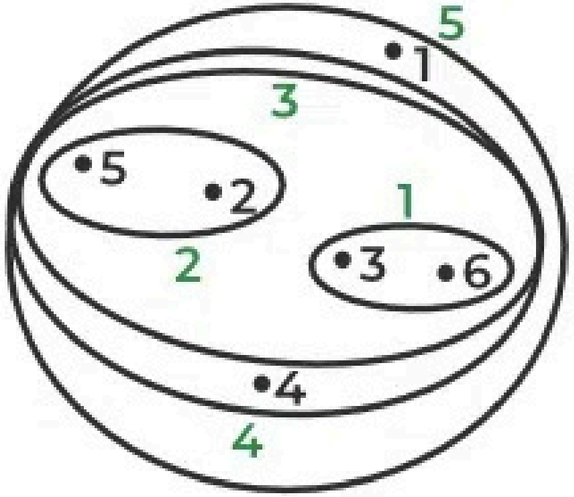
How Agglomerative Clustering Works?



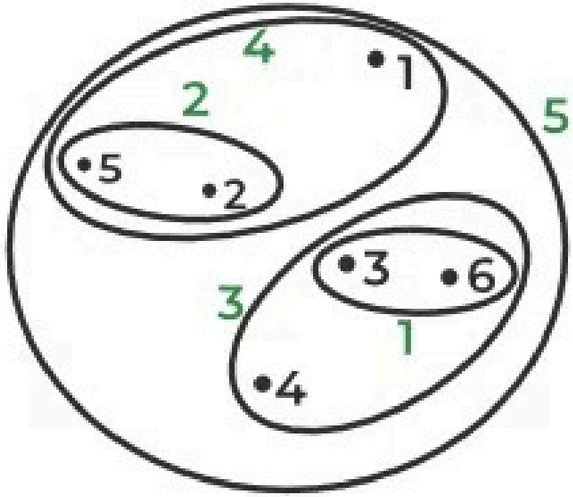
Steps in Agglomerative clustering

1. Start with individual points
2. Calculate distances between clusters
3. Merge the closest clusters
4. Update distance matrix
5. Repeat steps 3 and 4
6. Create a dendrogram

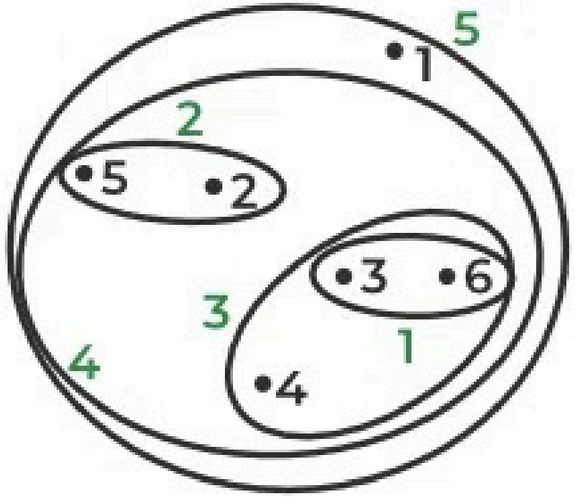
Distance Matrix Comparision in Hierarchical Clustering



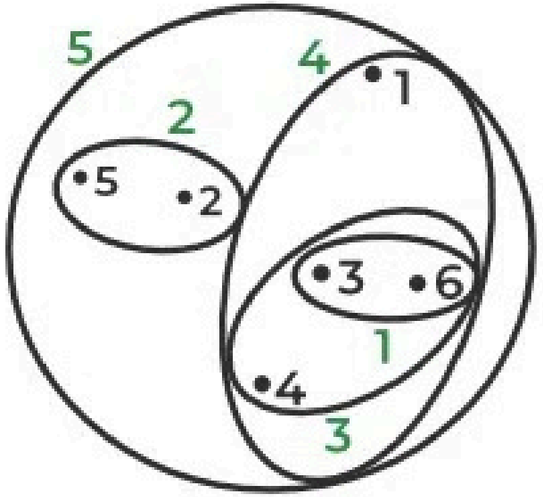
Min



Max



Group Average



Ward's Method