Hierarchical Clustering Methods

Hierarchical clustering is a powerful tool. It organizes data into a hierarchy of clusters. This presentation explores different methods. We will also discuss their applications.

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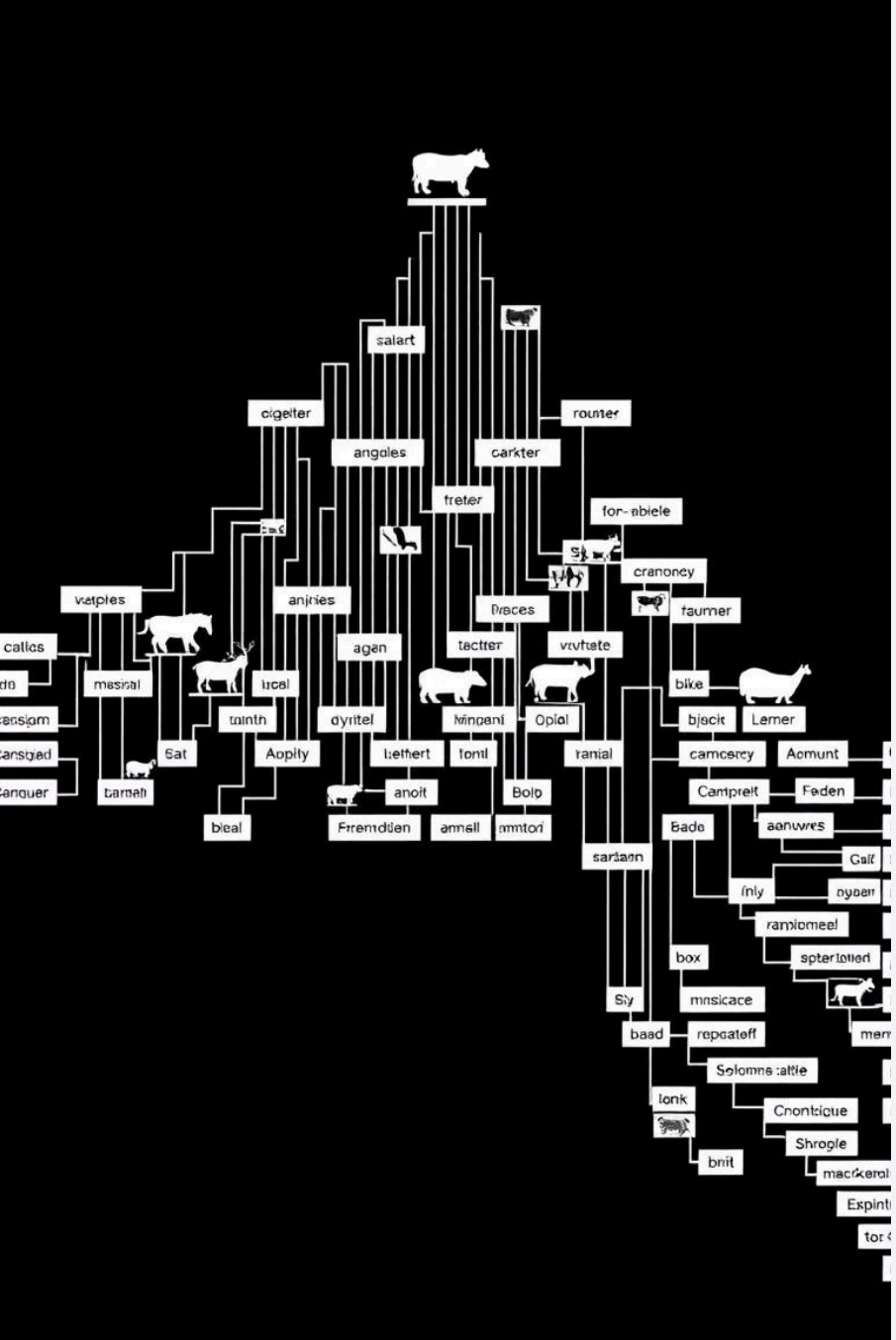


Agglomerative Clustering

Agglomerative clustering is a bottom-up approach. Each data point starts as its own cluster. Then, it merges the closest clusters iteratively.

1

Initialization

Each point is a cluster.

2

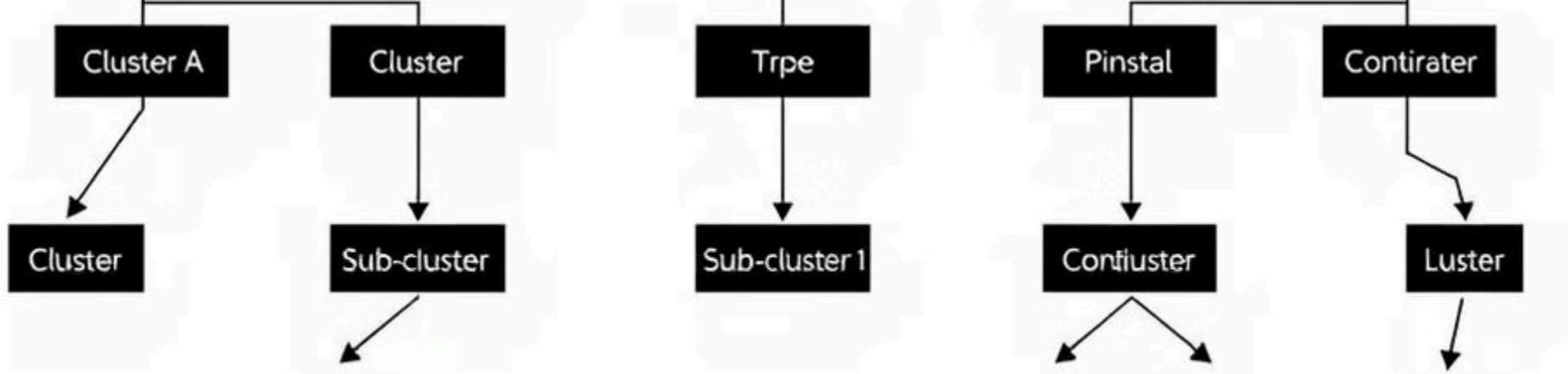
Merge

Combine nearest clusters.

3

Repeat

Continue until one cluster.



Divisive Clustering

Divisive clustering is a top-down approach. It starts with one cluster containing all data points. Then, it recursively divides clusters.

Start

One big cluster.

1

2

Divide

Split into subclusters.

Repeat

Continue dividing.

3

Linkage Methods

Linkage methods define cluster similarity. Common methods include single, complete, and average linkage. Each method affects cluster shape and separation.

Single Linkage

Minimum distance between points.

Complete Linkage

Maximum distance between points.

Average Linkage

Average distance between points.

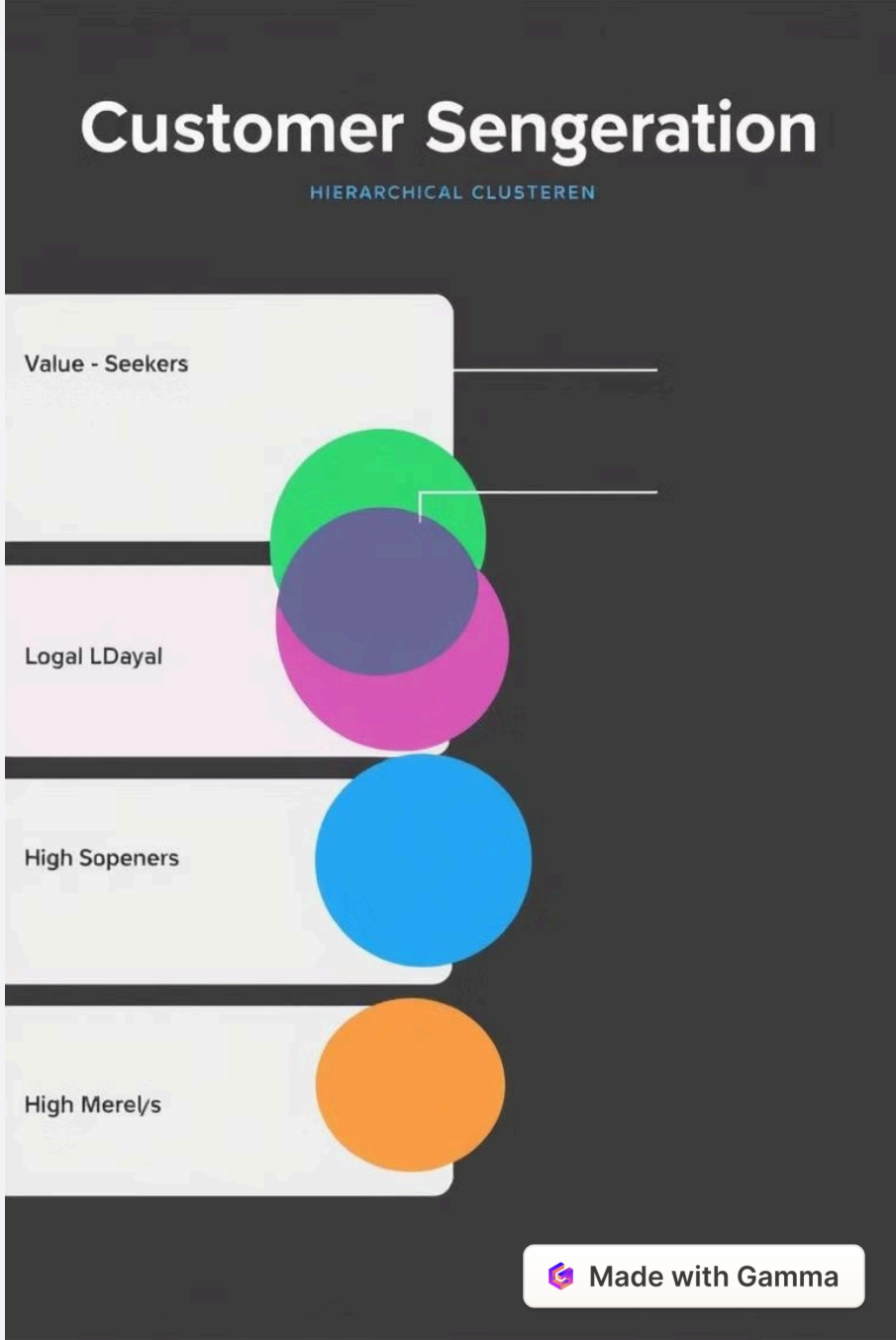
Applications of Hierarchical Clustering

Hierarchical clustering has diverse applications. These include customer segmentation, document clustering, and bioinformatics.

Customer Segmentation

Document Clustering

Bioinformatics



Key Takeaways

Hierarchical clustering offers a rich framework. It helps organize data into meaningful hierarchies. Understanding linkage methods is crucial.

Hierarchical

Builds data hierarchies.

Linkage

Defines cluster similarity.

Applications

Diverse real-world uses.