

CLUSTERING RESULTS REPORT

Clustering Algorithms Used:

1. Hierarchical Clustering

Dendrogram was used to determine the optimal number of clusters. Agglomerative clustering with Ward's linkage and Euclidean distance was applied.

2. K-Means Clustering

Clusters formed by minimizing intra-cluster variance. Principal Component Analysis (PCA) was used for dimensionality reduction and visualization.

Key Metrics and Findings:

1. Hierarchical Clustering

- Number of Clusters Formed: 10
- Davies-Bouldin Index: 0.9997, indicating good compactness and separation.
- Silhouette Score: 0.3125, indicating moderate cohesion with slight overlap between clusters.
- Dendrogram shows clear separations and distinct cluster distances.

2. K-Means Clustering

- Number of Clusters Formed: 10
- Davies-Bouldin Index: **1.0459**, slightly higher than Hierarchical Clustering, indicating less compactness.
- Inertia: 12.3782, reflects tight grouping of data points within clusters.
- Silhouette Score: 0.2874, indicates moderate overlap between clusters, with good separation in the PCA plot.