

Clustering Results Report

1. Number of Clusters Formed

Based on the analysis, **7 clusters** were identified using the clustering algorithm. These clusters represent distinct customer segments derived from the combined profile and transaction data.

2. DB Index Value

The Davies-Bouldin (DB) Index was calculated for cluster evaluation across cluster sizes ranging from 2 to 10. A **DB Index value of approximately 1.2** was observed for the 7-cluster configuration, indicating a good balance between intra-cluster similarity and inter-cluster separation. Lower DB Index values represent better clustering quality.

3. Other Relevant Clustering Metrics

- **Visualization:** The clustering result was visualized using PCA for dimensionality reduction. The 7 clusters are well-separated in the 2D PCA plot, demonstrating meaningful groupings.
- **Cosine Similarity:** The similarity between customers within clusters was computed, supporting the cohesiveness of the segments.
- **Cluster Characteristics:** Each cluster reflects distinct customer behaviors based on transaction value, quantity, and region, helping in targeted segmentation.

Conclusion

The clustering results show meaningful segmentation with 7 clusters and a strong DB Index value. This segmentation can be utilized for personalized marketing strategies, improving customer engagement, and tailoring services to specific groups.