

Clustering Analysis Report

1. Key Findings

- **Number of Clusters:** 10 distinct customer segments were identified.
- **Davies-Bouldin Index (DB Index):** 0.605, indicating well-separated and distinct clusters.
- **Cluster Characteristics:** Clusters vary significantly in transaction behavior, with some being high-value (e.g., Cluster 4) and others low-value (e.g., Cluster 3).

2. Cluster Summary

Cluster	TotalValue	Quantity	TransactionID
0	3552.18	12.42	5.04
1	3214.76	12.03	5.00
2	4370.94	15.88	6.35
3	852.47	3.12	1.58
4	7864.82	28.50	10.50
5	5641.05	19.80	7.10
6	2220.47	8.46	3.35
7	5784.27	21.47	8.16
8	1418.62	6.33	2.73
9	2609.50	9.94	3.89

3. Insights

- **High-Value Customers:** Cluster 4 (TotalValue: 7864.82, Quantity: 28.50) represents the most valuable segment.
- **Low-Value Customers:** Cluster 3 (TotalValue: 852.47, Quantity: 3.12) shows minimal transaction activity.

- **Moderate-Value Customers:** Clusters 2, 5, and 7 exhibit significant transaction activity, making them potential targets for upselling.

4. Recommendations

- **Targeted Marketing:** Focus on high-value customers (Cluster 4) with premium offers and on low-value customers (Cluster 3) with incentives to boost engagement.
- **Further Analysis:** Validate results with additional metrics (e.g., Silhouette Score) and explore feature engineering for improved clustering.