Customer Segmentation Report

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1. Introduction

This report presents the results of customer segmentation using clustering techniques. The goal of this analysis is to group customers into distinct segments based on their profiles and transactional behaviors. These insights can help businesses design targeted marketing strategies and optimize resource allocation.

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2. Clustering Process

1. Preprocessing:

- Merged customer profiles with aggregated transaction data.
- Numerical features (e.g., total revenue, transaction count, and quantity purchased) were normalized using StandardScaler.
- Categorical variables (e.g., Region) were one-hot encoded to ensure compatibility with clustering algorithms.

2. Optimal Clusters:

- The Elbow Method was used to determine the optimal number of clusters. Based on the inertia plot, the optimal number of clusters was identified as 4.

3. Clustering Algorithm:

- The K-Means Clustering Algorithm was applied to segment the customers. Customers were grouped into 4 clusters based on their similarity.

4. Evaluation Metrics:

- **Silhouette Score:** Indicates how well the clusters are separated. The score obtained was [Add Value].
- **Davies-Bouldin Index:** Measures intra-cluster similarity. The value obtained was [Add Value].

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3. Cluster Insights

Cluster 0: High Spenders

- Loyal customers with a high contribution to total revenue.
- They frequently shop and purchase in large quantities.

Cluster 1: Low Spenders

- Infrequent shoppers or new customers with minimal transactions and low spending.

Cluster 2: Mid-Tier Customers

- Customers with consistent spending patterns and moderate transaction frequency.

Cluster 3: Infrequent Buyers

- Occasional shoppers who make limited purchases but might represent potential growth opportunities.

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4. Conclusion

The segmentation analysis successfully grouped customers into four distinct clusters based on their profiles and transactional data. These clusters provide actionable insights to tailor marketing efforts, improve customer retention, and increase revenue.