Customer Segmentation Report

Overview

Customer segmentation was performed using clustering techniques to group customers based on their transactional and profile information. This analysis aims to identify distinct customer groups for targeted marketing strategies and enhanced business decision-making.

Methodology

- **Data Used**: Aggregated transaction data (TotalValue, Quantity) and profile information (Region) from Customers.csv and Transactions.csv.
- **Clustering Algorithm**: KMeans clustering with 5 clusters, as determined after testing values between 2 and 10.
- **Metrics Evaluated**: Davies-Bouldin Index (DB Index) and cluster distribution.

Results

- **Number of Clusters Formed**: 5
    - Cluster 0: 32 customers
    - Cluster 1: 51 customers
    - Cluster 2: 41 customers
    - Cluster 3: 47 customers
    - Cluster 4: 28 customers
- **Davies-Bouldin Index: 0.7951610834130648**
- **Features Contributing to Clustering**:
    - Total transaction value (TotalValue).
    - Total quantity purchased (Quantity).
    - Most frequent region of transactions (Region), encoded for clustering.

Insights

1. **Cluster Characteristics**:
    - Clusters represent groups of customers with similar spending behaviors and purchasing patterns.
    - For example, Cluster 1 has the highest number of customers, likely indicating a group with mid-range spending and moderate quantities.
2. **Actionable Outcomes**:
    - High-value clusters (e.g., Cluster 0) can be targeted for loyalty programs.
    - Regions with low representation may benefit from localized promotions to boost engagement.

3. **Opportunities**:
    - Tailored marketing campaigns for each cluster to maximize ROI.

Conclusion

The clustering analysis successfully segmented the customer base into 5 distinct groups. This segmentation provides actionable insights for personalizing marketing efforts and optimizing resource allocation. The Davies-Bouldin Index indicates the model's validity, supporting its application for strategic decision-making.

Deliverables

1. **Cluster Assignments**: Saved in Customer_Clusters.csv.
2. **Visualization**: Scatter plot showcasing customer cluster distributions.

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Date: 27/01/2025