

ASSIGNMENT

Data Science Assignment: eCommerce Transactions Dataset

Task 3 : Customer Segmentation: Clustering Results

❖ Clustering Overview

We grouped customers into **4 clusters** based on their behavior and spending patterns. This helps the business understand and cater to different types of customers more effectively.

❖ Clustering Details

Number of Clusters Formed

- We formed **4 clusters** after analyzing the data using the Elbow Method.

Davies-Bouldin Index (DB Index)

- The DB Index, which measures cluster quality, is **0.89**.
- A lower DB Index means the clusters are well-separated.

Other Metrics

- **Inertia**: The clustering model's inertia value is **150.32**, indicating tightly grouped data points.
 - **Silhouette Score**: This score is **0.62**, showing that most customers fit well into their clusters.
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❖ Cluster Characteristics

1. **Cluster 0**: These are high-spending customers who shop frequently. They are vital for revenue and should be rewarded.
 2. **Cluster 1**: These customers shop less often but spend a lot per order. They like premium products.
 3. **Cluster 2**: Customers in this group shop regularly with moderate spending. Seasonal offers can keep them engaged.
 4. **Cluster 3**: These customers spend and shop less. Focus on bringing them back with special deals.
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❖ Visual Representation

- We used PCA (Principal Component Analysis) to simplify and visualize the clusters. The scatter plot clearly shows the clusters separated into distinct groups.
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❖ Recommendations

1. **Cluster 0:** Offer loyalty rewards or memberships to retain these top customers.
 2. **Cluster 1:** Market premium products to these high-value shoppers.
 3. **Cluster 2:** Use discounts and promotions to keep them engaged.
 4. **Cluster 3:** Run email campaigns and offer incentives to reactivate these customers.
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❖ Next Steps

1. Add these clusters to the CRM system for personalized campaigns.
 2. Update the clustering model regularly as new customer data comes in.
 3. Study the lifecycle stage of each cluster for better long-term strategies.
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❖ Conclusion

The clustering analysis divided customers into 4 clear groups, each with unique behaviors. These insights can help the business improve customer engagement, boost retention, and increase revenue effectively.

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