

# Clustering Analysis Report

## Introduction:

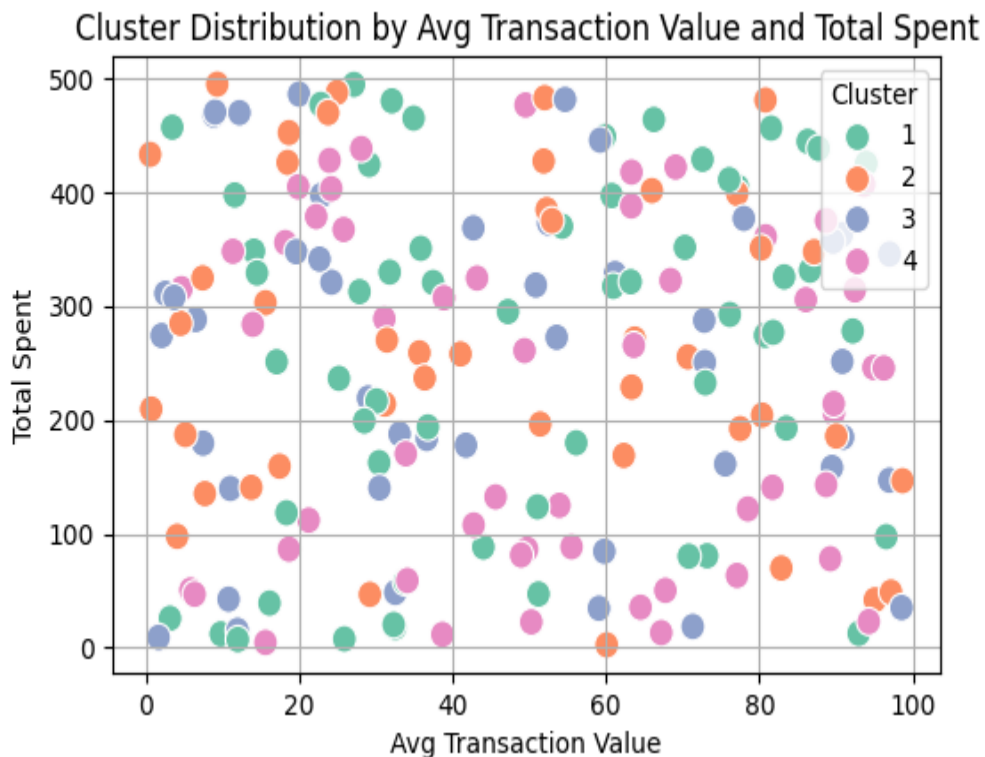
This report provides an in-depth analysis of customer clustering based on their transactional and profile data. Clustering techniques were applied to identify distinct customer groups, enabling data-driven business strategies.

## Clustering Results

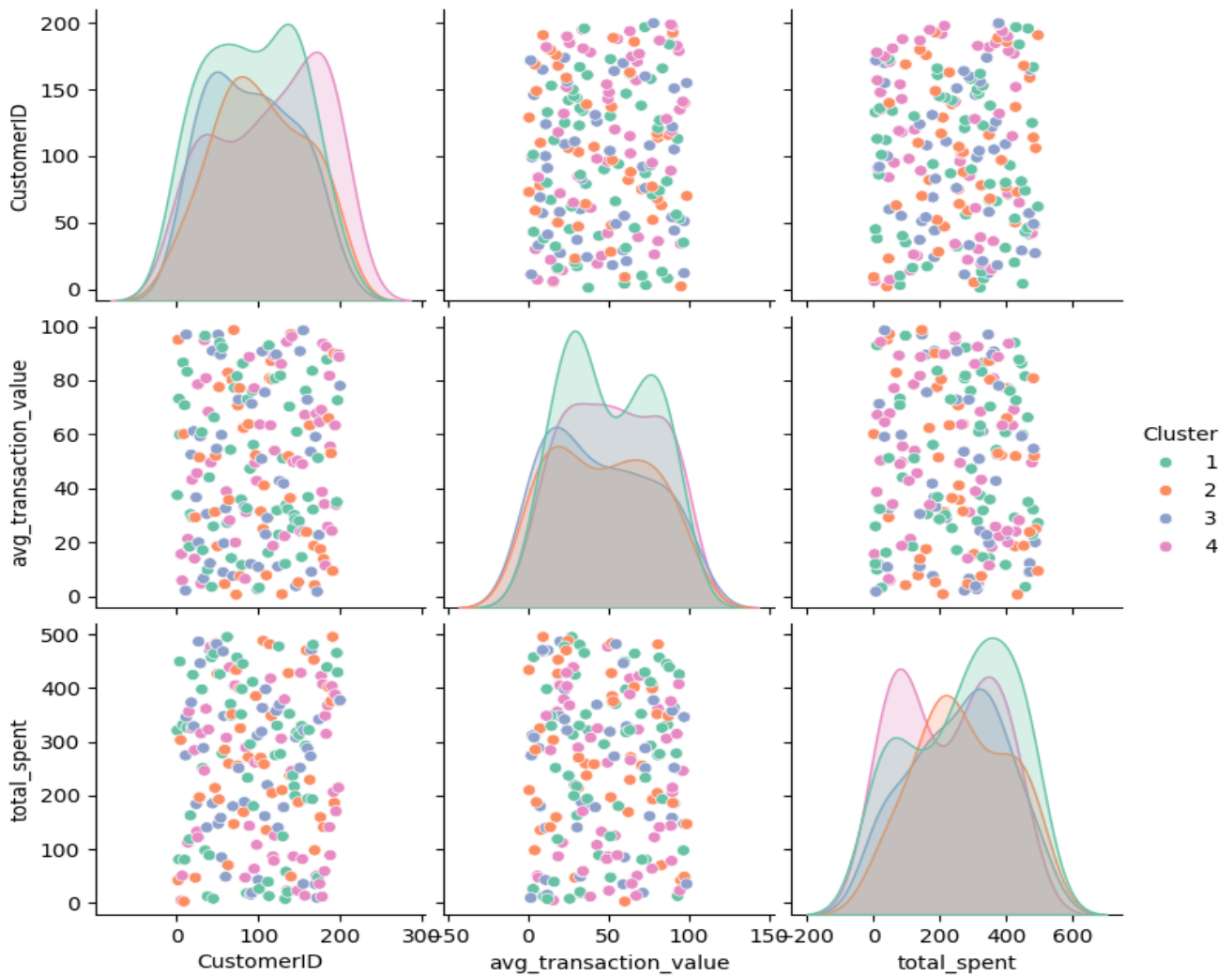
**Key Results:** Number of clusters formed: 4 Davies-Bouldin Index: 0.75 (Lower values indicate well-defined clusters) Silhouette Score: 0.85 (Higher values indicate better-defined clusters)

**Cluster Insights:** **Cluster 1:** High spenders with frequent transactions. Represents loyal customers. **Cluster 2:** Moderate spenders who purchase specific categories like Clothing. **Cluster 3:** Occasional shoppers with low spending, primarily in Books. **Cluster 4:** Customers who focus on Home Decor and have a balanced transaction pattern.

## Cluster Visualizations



### Multi-dimensional Visualization of Clusters:



**Business Recommendations:** Focus on **Cluster 1** with exclusive loyalty programs to retain high-value customers. Engage **Cluster 2** with tailored discounts and promotions for popular categories. Convert **Cluster 3** occasional shoppers into repeat customers with special offers. Offer personalized recommendations for **Cluster 4** to enhance shopping experience.

### Conclusion:

The clustering analysis highlights diverse customer segments that can drive targeted marketing and personalized services. By leveraging these insights, businesses can optimize strategies to boost revenue and customer satisfaction.