

# Customer Segmentation Report

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### 1. Feature Engineering:

- Aggregated transaction data by customers to calculate TotalSpent, TotalTransactions, and AvgTransactionValue.

### 2. Standardization:

- Applied StandardScaler to normalize features before clustering.

### 3. Elbow Method:

- Determined the optimal number of clusters using the Sum of Squared Errors (SSE).

### 4. K-Means Clustering:

- Performed clustering with K=3 (optimal clusters based on Elbow Method).
- Assigned cluster labels to each customer.

### 5. Clustering Metrics:

- Davies-Bouldin Index: Used to evaluate clustering quality. A lower value indicates better-defined clusters.

### 6. Visualization:

- Generated scatter plot to visualize the clusters.

### Summary:

## **Customer Segmentation Report**

- Customer segmentation helps identify distinct customer groups, enabling targeted marketing strategies and personalized experiences.