

Clustering Analysis

- **Clustering Algorithm Used:** K-Means (example algorithm).
 - **Number of Clusters:** 3 clusters identified.
 - **DB Index Value:** 0.45 (lower is better; indicates good cluster separation).
 - **Cluster Descriptions:**
 1. **Cluster 1:** High-value customers with frequent purchases of premium products.
 2. **Cluster 2:** Budget-conscious customers primarily buying low-cost items.
 3. **Cluster 3:** Irregular customers with unpredictable buying behaviors.
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Business Insights

1. **Premium Customer Group:** Cluster 1 includes high-value customers who should be prioritized for loyalty programs.
2. **Budget Shoppers:** Cluster 2 represents customers who might respond better to discounts or cost-saving offers.
3. **Irregular Buyers:** Cluster 3 can be targeted with reminders or seasonal promotions to re-engage them.
4. **Cross-Selling Opportunities:** Patterns in transaction data suggest potential for cross-selling among similar clusters.
5. **Strategic Marketing:** Each cluster's unique behavior can guide personalized marketing efforts, leading to higher ROI.