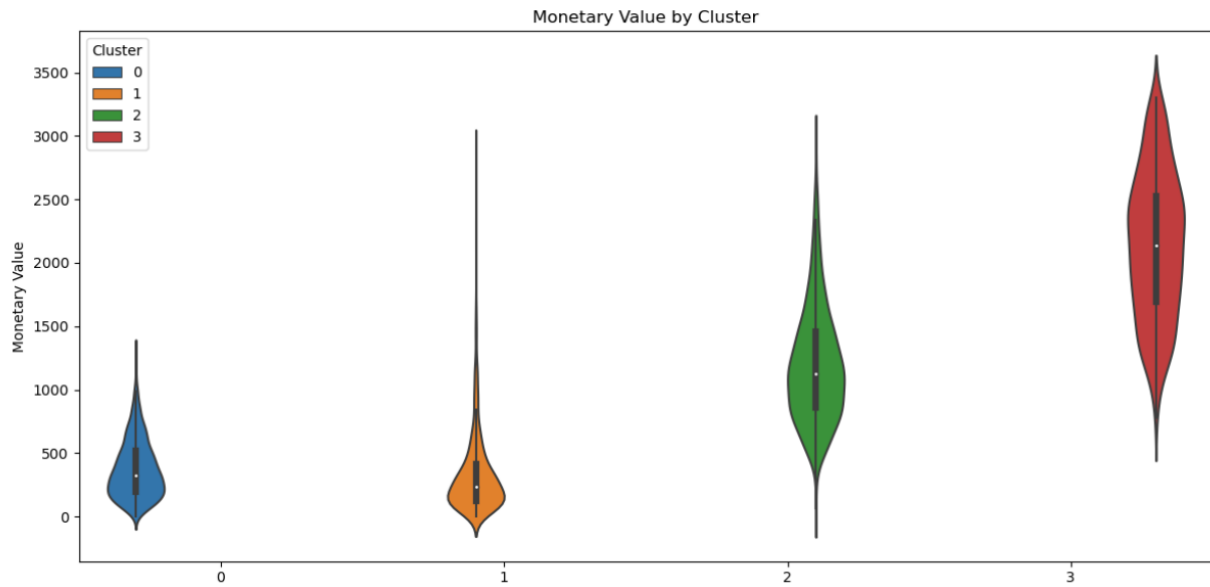# Cluster Analysis

Monetary Value by Cluster

- **Cluster 0 (Blue):** Customers in this cluster have lower monetary value compared to others.

- **Cluster 1 (Orange):** The monetary value is the lowest in this cluster, possibly representing low-spending, inactive customers.

- **Cluster 2 (Green):** Moderate monetary value is observed.

- **Cluster 3 (Red):** This cluster has the highest monetary value, indicating high-value customers who contribute significantly to revenue.

Frequency by Cluster
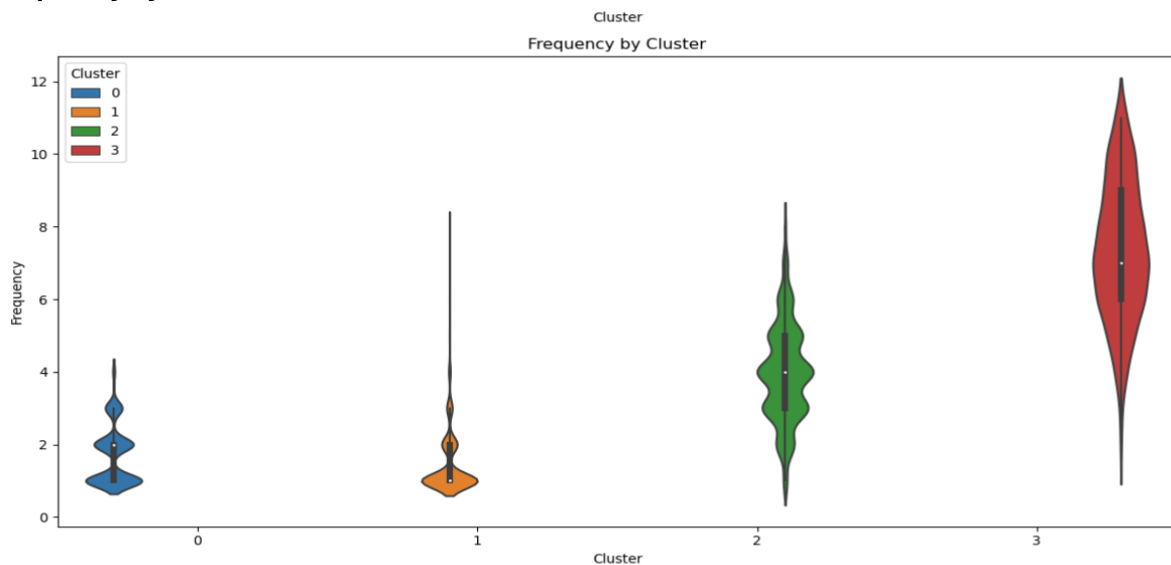
- **Cluster 0 (Blue):** Low purchase frequency; occasional buyers.

- **Cluster 1 (Orange):** The lowest frequency; likely one-time buyers or dormant customers.

- **Cluster 2 (Green):** Moderate frequency; regular but not highly frequent buyers.

- **Cluster 3 (Red):** High frequency; frequent buyers and likely loyal customers.

Recency by Cluster
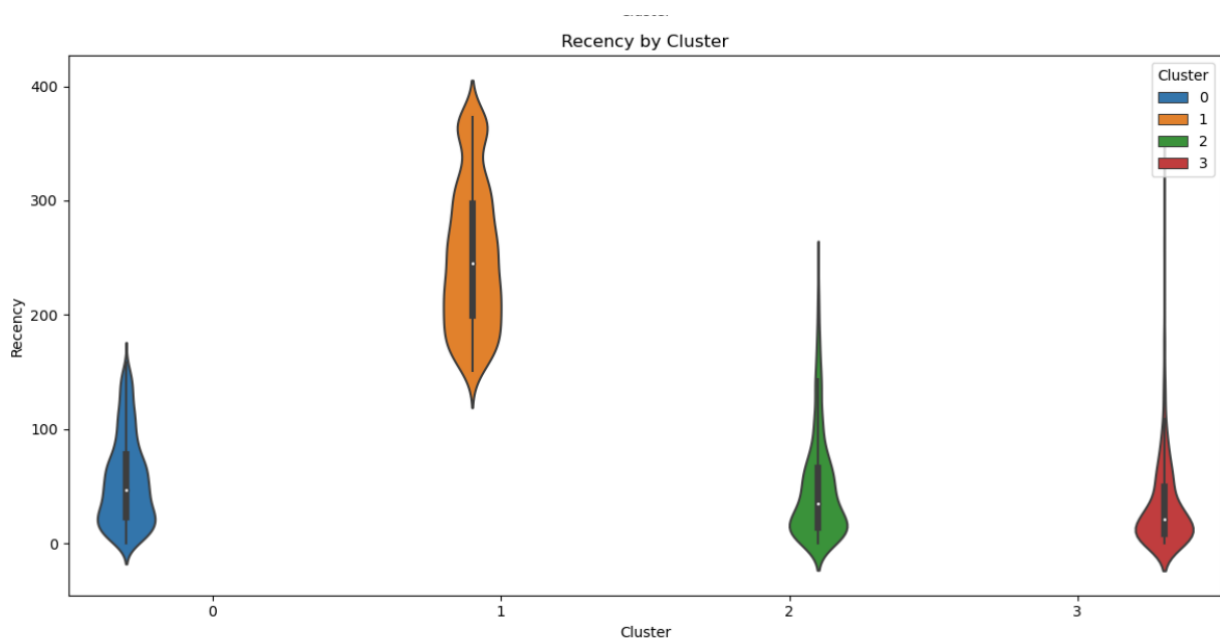
- **Cluster 0 (Blue):** Customers are relatively recent buyers, indicating engagement within a short timeframe.

- **Cluster 1 (Orange):** Long recency, suggesting these customers are inactive and haven't engaged recently.

- **Cluster 2 (Green):** Moderate recency; not the most recent buyers, but still reasonably engaged.

- **Cluster 3 (Red):** Fairly recent buyers, highlighting active and engaged customers.

Recommendations

Cluster 0: Low Value, Moderate Engagement

- **Retention Strategy:**
    - Send personalized discount offers to encourage higher spending.
    - Highlight new product launches to re-engage.
- **Upselling:** Promote mid-tier products to increase average order value.

Cluster 1: Inactive and Low-Value Customers

- **Reactivation Strategy:**
    - Launch win-back campaigns with exclusive discounts.
    - Use reminders or incentives like free shipping for their next order.
- **Reduce Costs:** Limit marketing investments toward this cluster if ROI is low.

Cluster 2: Moderate Value, Moderate Engagement

- **Loyalty Building:**
    - Implement loyalty programs to encourage repeat purchases.
    - Offer targeted promotions for higher frequency and upselling.
- **Engagement:**
    - Provide personalized product recommendations based on purchase history.

Cluster 3: High Value, High Engagement

- **Retention & Rewarding:**
    - Focus on maintaining loyalty through VIP programs or early access to sales.
    - Offer exclusive perks such as free gifts or premium support.
- **Referral Programs:** Leverage their loyalty by incentivizing them to refer others.

Outlier Analysis:

1. Cluster -3

- **Monetary Value**: Extremely high compared to the other clusters, indicating these customers contribute significantly to revenue.
- **Frequency**: Moderately high; these customers purchase fairly often but not the most frequently.
- **Recency**: Low; these customers made purchases recently, suggesting they are actively engaged.

Category: Top-tier VIP Customers

- These customers are high-value contributors and actively engaged.
- They are likely loyal and spend significantly on each purchase.

Recommendations:

- **Retention Strategies**: Offer exclusive perks or loyalty rewards to retain them.
- **Upsell/Cross-sell**: Promote premium or complementary products/services.
- **Personalized Engagement**: Send personalized messages, VIP events, or premium support.

2. Cluster -2

- **Monetary Value**: Low compared to Cluster -3, but higher than Cluster -1.
- **Frequency**: Moderate; purchases are consistent but not very frequent.
- **Recency**: High; it has been a long time since they made a purchase.

Category: Dormant or Disengaged Customers

- These customers were once valuable but have recently become less active.

Recommendations:

- **Win-back Campaigns**: Send re-engagement offers, such as discounts or limited-time deals.
- **Feedback Collection**: Understand why their activity has declined (e.g., surveys or feedback forms).
- **Targeted Marketing**: Share value-driven content or reminders of past purchases.

3. Cluster -1

- **Monetary Value**: Lowest among the clusters; they generate minimal revenue.

- **Frequency**: Very low; these customers rarely make purchases.

- **Recency**: Moderate; they are neither very recent nor very old customers.

Category: Low-value/ Occasional Customers

- These customers exhibit low engagement and spend.

Recommendations:

- **Cost-efficient Engagement**: Use automated, low-cost marketing strategies to maintain light communication (e.g., emails, newsletters).

- **Promotions**: Offer entry-level discounts to encourage purchases.

- **Segmentation Experimentation**: Consider segmenting further to understand if some can be nurtured into higher-value customers.

Cluster	Monetary Value	Frequency	Recency	Suggested Action-Based Name
Cluster -3	Very High	Moderately High	Recent	VIP Retention Focus
Cluster -2	Moderate	Moderate	Long Ago	Win-Back Campaign Target
Cluster -1	Low	Very Low	Moderate	Minimal Engagement – Passive Nurturing
Cluster 0	Low	Low	Recent	Encourage Growth – Upsell & Frequency Boost
Cluster 3	High	High	Recent	Loyalty & Referral Expansion
Cluster 2	Moderate	High	Recent	Consistent Spenders – Strengthen Relationship
Cluster 0	Low	Moderate	Recent	Develop into Repeat Buyers