Exploratory Data Analysis and Business Insights Report

1. Introduction

This report provides insights derived from the exploratory data analysis (EDA) of an eCommerce transactions dataset. The dataset includes customer details, product information, and transaction records. The primary goal is to uncover patterns, trends, and actionable business insights to guide strategic decision-making.

2. Summary of Insights

Customer Insights

1. **Count of Unique Customer Signups by Year**:

   - In 2022, 64 customers signed up, followed by 56 in 2023, and 79 in 2024. Signups show an upward trend, with 2024 being the year with the highest growth.

2. **Customers with the Highest Lifetime Value (CLV)**:

   - The top customer, **C0141**, contributes a CLV of $10,673.87, followed by **C0054** with $8,040.39. Retaining these high-value customers is critical for business growth.

3. **Customer Recency**:

   - The average recency (days since the last purchase) is approximately **100 days**, indicating that many customers may require re-engagement.

4. **Frequent Customers**:

   - Frequent customers include **C0109**, **C0156**, **C0141**, **C0175**, and **C0065**, showing strong customer loyalty.

Product Insights

5. **Best-Selling Products**:

   - Top-selling products include **Activewear Smart Watches**, **Soundwave Headphones**, and **Home Sense Desk Lamp**.

6. **Highest Revenue-Generating Products**:

   - Products generating the most revenue are **Activewear Smart Watches**, **Soundwave Headphones**, and **Activewear Jacket**.

7. **Revenue by Product Category**:

Revenue distribution across categories:

- **Books**: 27.8%
- **Electronics**: 26.2%
- **Clothing**: 24.1%
- **Home Decor**: 21.9%

8. **Average Product Prices by Category**:

- **Books**: $292.21, **Electronics**: $275.35, **Clothing**: $263.72, **Home Decor**: $235.02

Sales and Revenue Insights

9. **Monthly Revenue Trends**:

- Revenue trends highlight peaks in December (~~$70k) and dips in early months~~ ($40k-$50k).

10. **Revenue by Region**:

- **South America** leads with $220,000, followed by **Europe** ($170,000), **Asia** ($150,000), and **North America** ($150,000).

11. **Time of Day Trends**:

- Transactions are highest during **Night (36.5%)**, followed by **Morning (24.8%)**, **Afternoon (21.4%)**, and **Evening (17.3%)**.

12. **Day of the Week Trends**:

- The highest transaction days are **Wednesday**, **Tuesday**, and **Monday**.

13. **Average Revenue Per Transaction**:

- Monthly averages range from $600 (March) to $940 (December).

14. **Repeat Customers**:

- **94%** of customers are repeat buyers, showing strong customer loyalty.

15. **Average Revenue Per Customer by Region**:

- **South America**: $3,700, **Asia**: $3,500, **Europe**: $3,400, **North America**: $3,300

4. Recommendations

Based on the analysis, the following actions are recommended:

1. **Retain High-Value Customers**: Focus on loyalty programs and personalized offers for customers with high CLV, such as **C0141** and **C0054**.
2. **Re-Engage Inactive Customers**: Target customers with high recency to encourage repeat purchases through promotions or discounts.
3. **Leverage Regional Insights**: Invest in marketing efforts in **South America**, which contributes the most revenue, while identifying strategies to grow revenue in other regions.
4. **Optimize Inventory**: Stock more of the best-selling and high-revenue products to ensure availability.
5. **Time-Specific Promotions**: Schedule marketing campaigns during high-traffic times (e.g., nights and weekends) to maximize impact.

5. Conclusion

The EDA has provided actionable insights into customer behavior, product performance, and revenue trends. By leveraging these insights, the business can make data-driven decisions to enhance customer satisfaction, improve sales, and maximize profitability.