E-Commerce Data Science Analysis Report

Task 1: Exploratory Data Analysis (EDA) and Business Insights

Data Overview

The analysis was performed on three interconnected datasets:

- Customers.csv: Customer demographic and signup information

- Products.csv: Product catalogue and pricing data

- Transactions.csv: Detailed transaction records

Key Business Insights

1. **Regional Market Dominance** South America leads customer distribution with approximately 29% of the customer base (58 customers), followed by Europe (25%), and equal representation in North America and Asia (22.5% each). This suggests successful penetration in emerging markets while maintaining strong presence in developed regions.

2. **Customer Acquisition Trends** Analysis of signup patterns reveals a significant acceleration in customer acquisition from mid-2023 onwards, following a temporary slowdown in early 2023. The sharp upward trajectory indicates successful marketing initiatives and suggests strong market momentum going into 2024.

3. **Product Portfolio Balance** The product catalog shows remarkable equilibrium across categories:

- Books: 26.0%

- Electronics: 26.0%

- Clothing: 25.0%

- Home Decor: 23.0% This even distribution indicates strategic product diversity and broad market appeal.

4. **Transaction Value Analysis** With an average transaction value of $690.00 and total revenue of $689,995.56, the platform demonstrates strong performance in the medium to high-value transaction segment. The platform has achieved significant revenue while maintaining a focused customer base of 200 users.

5. **Customer Retention Metrics** The average customer age on the platform of 558 days indicates strong customer retention and platform stickiness. This suggests effective customer engagement strategies and satisfactory user experience.

Visual Analysis Results

Customer Distribution

The geographic distribution visualization shows:

- Clear leadership in South American market

- Balanced presence across other regions

- Opportunity for expansion in Asian markets

Product Pricing Strategy

The price distribution histogram reveals:

- Primary concentration in $100-150 range

- Secondary clusters around $300-400

- Premium product presence up to $500

- Strategic price point positioning across segments

Customer Growth Trajectory

The signup trends graph demonstrates:

- Initial stability in early 2022

- Strategic realignment period in early 2023

- Accelerated growth phase from mid-2023

- Strong momentum into 2024