**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.

1. **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.
2. **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