

# Exploratory Data Analysis (EDA) Report

## Dataset Overview

1. Brief description of the dataset used:
  - a. **Customers:** Includes customer details such as demographics, region, and signup trends.
  - b. **Products:** Contains product information like category and price distribution.
  - c. **Transactions:** Summarizes purchase behavior.
2. **Objective:**
  - a. To analyze customer demographics, regional distribution, product categories, and transaction trends to derive meaningful business insights.

## Key Visualizations and Insights

1. **Customer Distribution by Region**
  - a. Visual: Bar plot showing South America, Europe, North America, and Asia.
  - b. Insight: South America has the highest number of customers, while Asia has the lowest. This suggests marketing strategies can focus on expanding customer acquisition in Asia.
2. **Signup Trends Over the Years**
  - a. Visual: Line chart showing customer signups from 2022 to 2024.
  - b. Insight: A significant dip in signups was observed in 2023, followed by a sharp increase in 2024, indicating potential external factors or marketing success in 2024.
3. **Product Category Distribution**
  - a. Visual: Bar chart showing categories (Books, Electronics, Clothing, and Home Decor).
  - b. Insight: All categories have similar numbers of products, ensuring a balanced product portfolio. However, further analysis is needed to identify which category performs best in sales.
4. **Product Price Distribution**
  - a. Visual: Histogram showing product prices with a density curve.
  - b. Insight: Most products are priced in the \$100-\$400 range, with peaks around \$100 and \$400. A pricing strategy could target these price points for promotions.

## Business Insights

1. **Regional Focus:**
  - a. South America leads in customer count, but expansion opportunities exist in Asia due to its lower customer base.

2. **Customer Acquisition:**
  - a. The dip in 2023 signups highlights a need to investigate the reasons and maintain consistency in marketing efforts.
3. **Product Portfolio:**
  - a. A well-balanced distribution among categories provides flexibility in diversifying promotional efforts.
4. **Pricing Strategy:**
  - a. Popular price points (\$100-\$400) should guide discounting and bundling strategies for better sales performance.
5. **Growth Opportunity:**
  - a. The recovery in 2024 suggests analyzing successful campaigns to replicate them in underperforming regions.

## **Conclusions and Recommendations**

- Expand customer base in Asia through targeted campaigns.
- Investigate reasons for 2023 signup decline to prevent future dips.
- Optimize marketing strategies around the \$100-\$400 price range.
- Focus on replicating the success of 2024 campaigns for consistent growth.