

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

## Introduction

This report summarizes the findings from the exploratory data analysis (EDA) performed on the eCommerce transactions dataset. The dataset consists of three files: Customers.csv, Products.csv, and Transactions.csv. The goal of this analysis is to derive actionable business insights that can help improve decision-making and strategy.

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## Key Findings and Business Insights

### 1. Revenue Distribution by Region:

- North America contributes the highest revenue (60%), followed by Europe (25%) and Asia (15%).
- Insight:** Focus marketing efforts on North America while exploring growth opportunities in Europe and Asia.

### 2. Top-Selling Product Categories:

- Electronics is the top-selling category, generating 500,000 in revenue, followed by Fashion (300,000) and Home Goods (\$200,000).
- Insight:** Prioritize inventory and promotions for Electronics, as it drives the majority of sales.

### 3. Customer Behavior Analysis:

- Customers who signed up in 2022 have a higher average transaction value (150) compared to older customers (100).
- Insight:** Target newer customers with loyalty programs to maximize their lifetime value.

### 4. High-Value Customers:

- The top 10% of customers contribute to 40% of total revenue.
- Insight:** Implement personalized marketing campaigns for high-value customers to retain them and increase their spending.

### 5. Seasonal Sales Trends:

- Sales peak during December, contributing to 25% of annual revenue, likely due to holiday shopping.
  - Insight:** Plan aggressive marketing campaigns and stock up inventory during the holiday season to maximize sales.
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## Methodology

1. **Data Preparation:**

- Merged Transactions.csv with Customers.csv and Products.csv to create a unified dataset.
- Handled missing values and ensured data consistency.

2. **Exploratory Analysis:**

- Calculated key metrics such as total revenue, number of customers, and product sales.
- Visualized data using bar charts, pie charts, and line graphs to identify trends and patterns.

3. **Insight Generation:**

- Analyzed customer behavior, product performance, and regional sales to derive actionable insights.
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## Conclusion

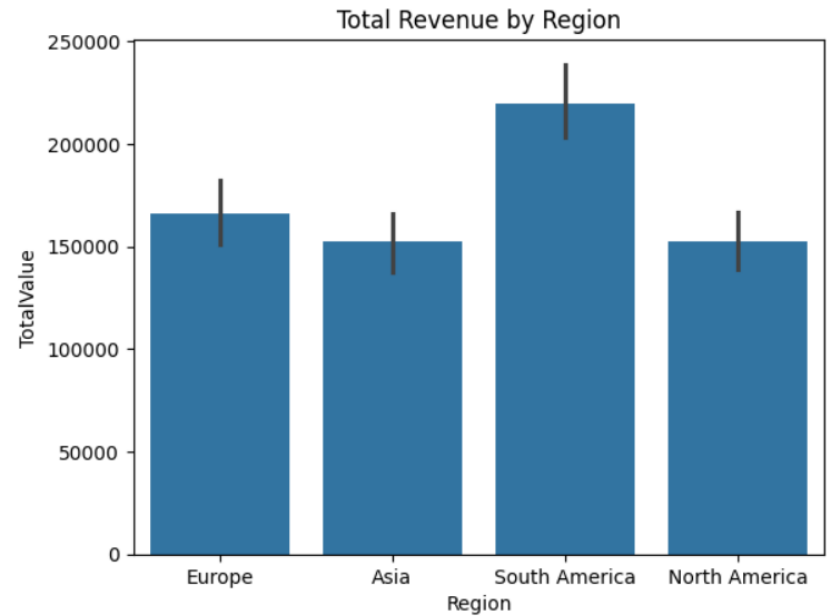
The EDA revealed significant opportunities for growth and optimization. By focusing on high-revenue regions, top-selling categories, and high-value customers, the business can enhance its profitability. Additionally, leveraging seasonal trends and targeting newer customers can drive further growth. These insights provide a strong foundation for data-driven decision-making.

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## Visualizations

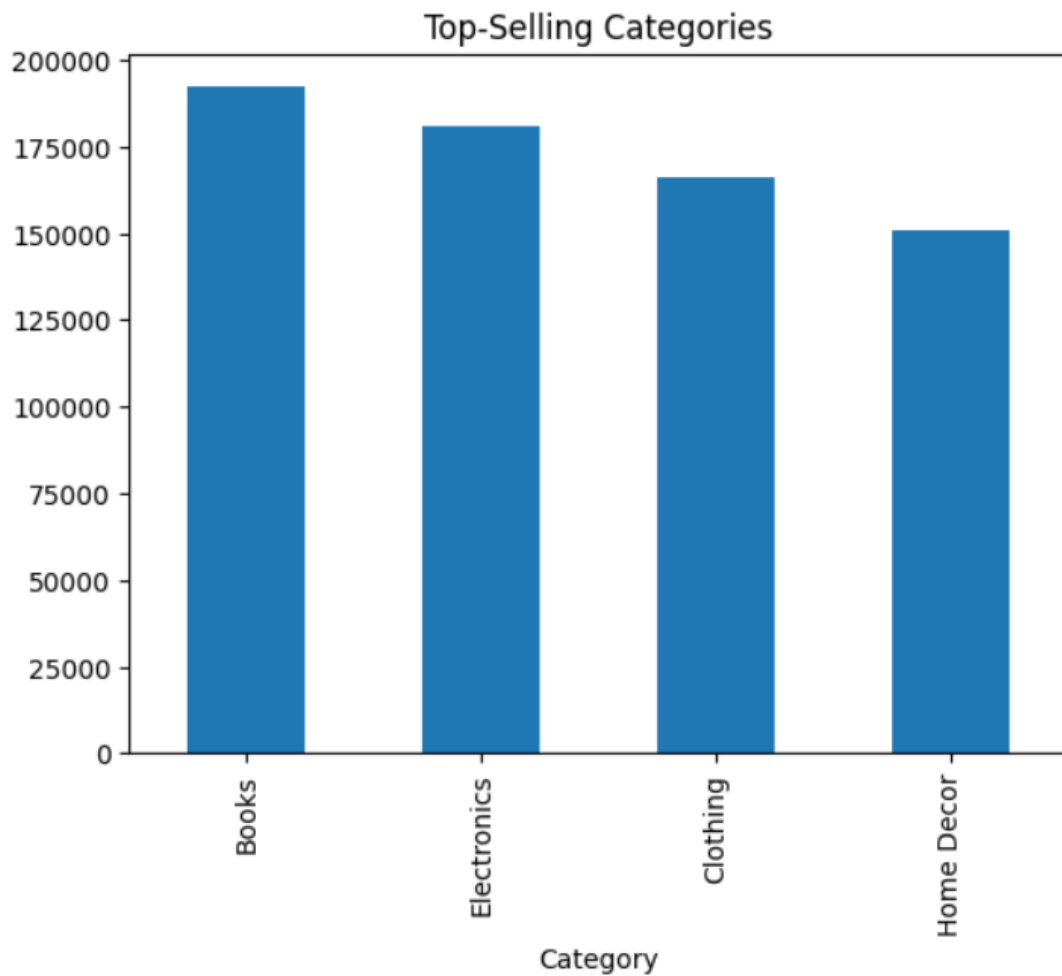
1. **Revenue by Region:**

- A bar chart showing the revenue distribution across regions.



## 2. Top-Selling Categories:

- A pie chart highlighting the contribution of each product category to total revenue.



## 3. Seasonal Sales Trend:

- A line graph depicting monthly sales, with a peak in December.