Zeotap Assignment

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

1. Customer Region Distribution

Insight:

South America has the highest **number of customers (59),** followed by Europe (50) and North America (46).

Asia has the **smallest customer base (45),** suggesting an opportunity for growth in this region through **targeted marketing strategies**.

```
Customer Region Distribution:
Region
South America    59
Europe           50
North America    46
Asia             45
Name: count, dtype: int64
```


Customer Distribution by Region
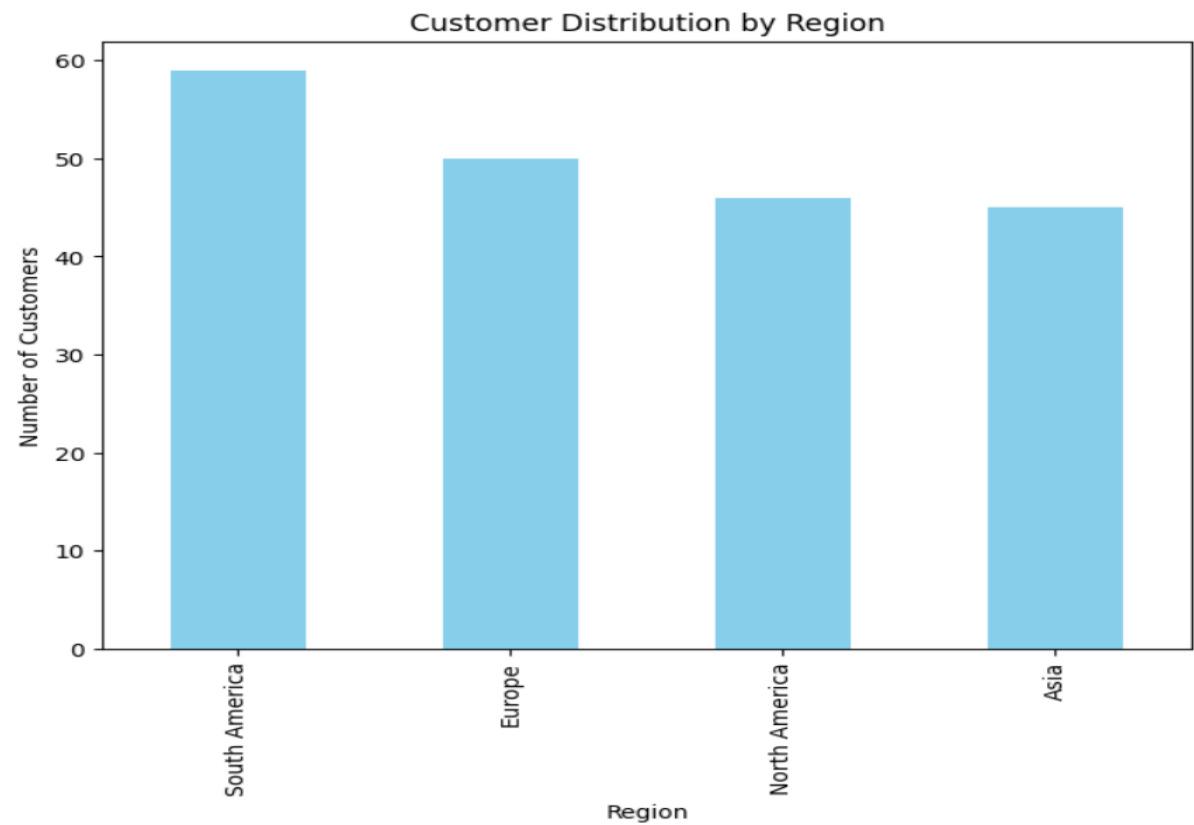
2. Product Category Distribution:

- The **Books** and **Electronics** categories each dominate in product count, both having 26 products. This indicates that these categories are the primary focus of the product portfolio.

- **Home Decor** has the fewest products, with only 23, suggesting that it could be an area for potential expansion. Expanding the product range in this category could help balance the portfolio and meet customer demands for more variety.

**2.1 Revenue Contribution by Product Category:**

Insight:

The Electronics category contributes the highest revenue, showcasing its prominence in sales and profit margins.

Books follow closely, suggesting a strong customer base for intellectual and entertainment-related products.

Home Decor ranks lowest in revenue contribution, highlighting an opportunity to optimize offerings or marketing strategies for this category.

```
Product Category Distribution and Revenue:
Category
Books          192147.47
Electronics    180783.50
Clothing       166170.66
Home Decor     150893.93
Name: Revenue, dtype: float64
```

Revenue Contribution by Product Category
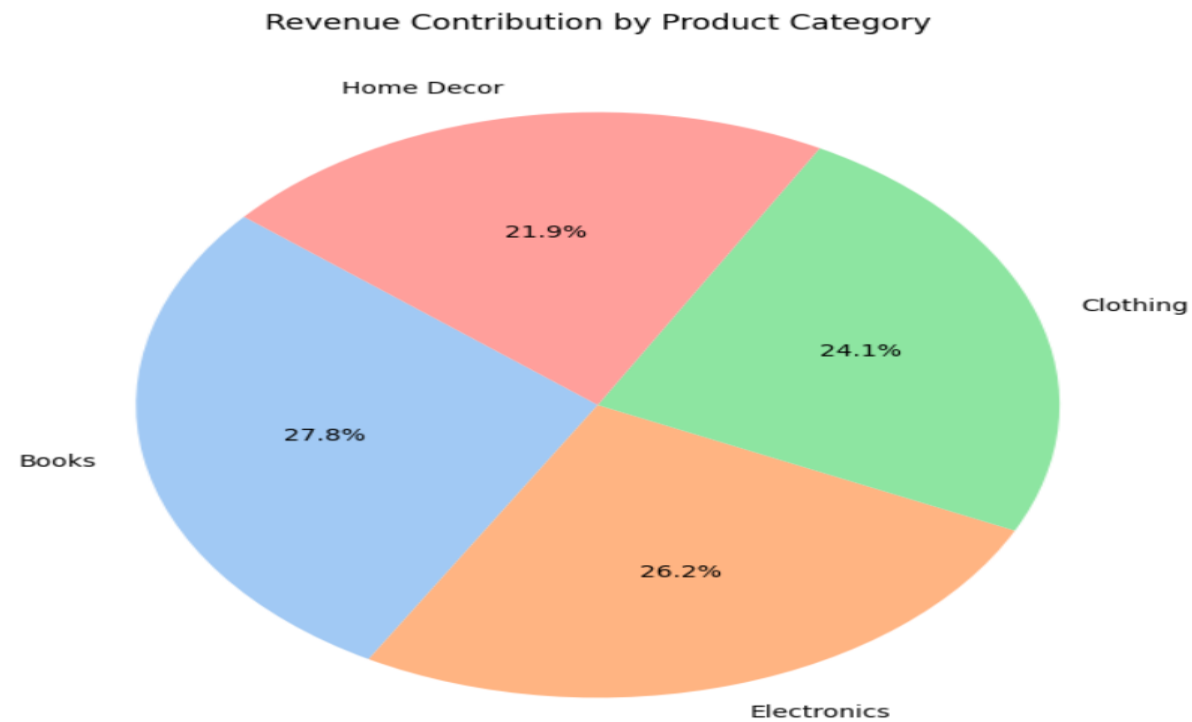
3. Transaction Trends Over Time

Insight:

Transactions are steadily increasing from **December 30, 2023, to January 3, 2024**.

This could reflect **post-holiday shopping activity**, highlighting the importance of promotions during this period.

```
Transaction Trends Over Time:
TransactionDate
2023-12-30    1
2023-12-31    3
2024-01-01    4
2024-01-02    4
2024-01-03    4
dtype: int64
```


Transaction Trends Over Time
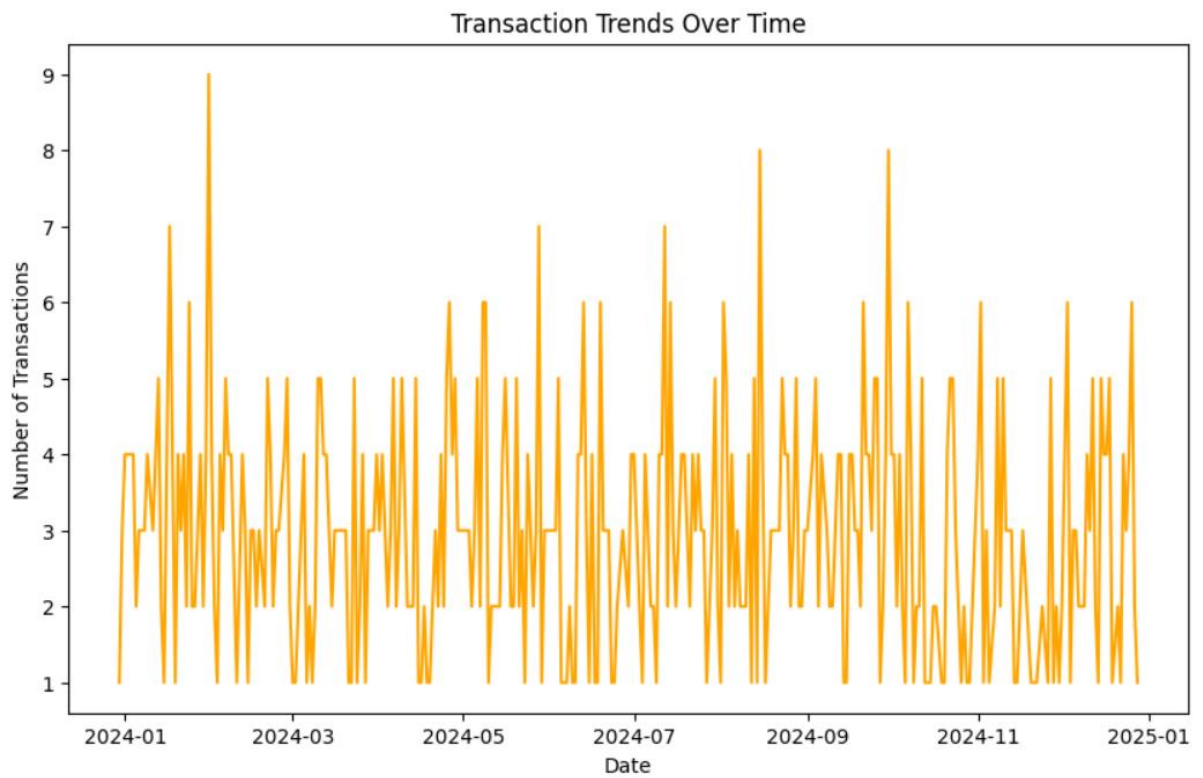
4. High-Value Customers

Insight:

Customer **C0141 is the highest spender**, contributing **$10,673.87** in revenue, followed by Customer **C0054 with $8,040.39.**

The top 5 customers represent a significant portion of revenue. **Implementing loyalty programs or exclusive deals** for these customers could enhance retention and increase their lifetime value.

```
Top 5 High-Value Customers:
 CustomerID
C0141     10673.87
C0054      8040.39
C0065      7663.70
C0156      7634.45
C0082      7572.91
Name: TotalValue, dtype: float64
```


Top 10 High-Value Customers
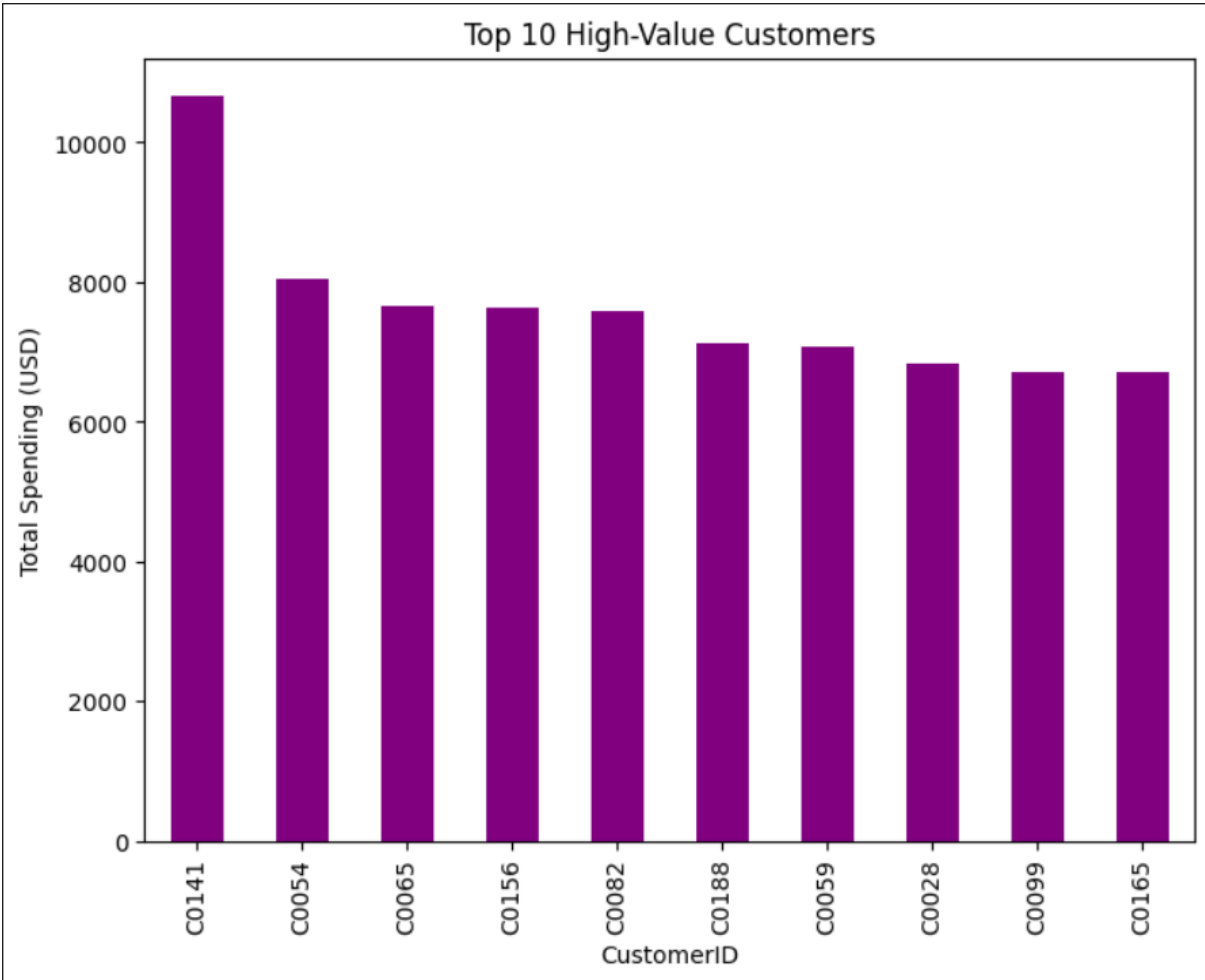
5. Popular Products

Insight:

The most popular product is the **SoundWave Cookbook (46 units sold)**, followed by **SoundWave Jeans (46 units sold)**.

Electronics (e.g., TechPro Headphones) and **Books** are among the **most frequently** purchased products, suggesting **strong demand for tech and reading-related items**.

Cross-promotional strategies, such as bundling high-demand products with less popular items, could maximize sales.

```
Top 10 Popular Products:
   ProductID  Quantity         ProductName     Category    Price
0       P054        46    SoundWave Cookbook       Books    57.30
1       P059        46       SoundWave Jeans    Clothing   303.20
2       P029        45    TechPro Headphones  Electronics  433.64
3       P048        43       TechPro Cookbook       Books   416.40
4       P057        43  ActiveWear Smartphone  Electronics  239.70
5       P061        43    HomeSense Desk Lamp   Home Decor  156.96
6       P079        43        ActiveWear Rug    Home Decor  417.37
7       P062        39       HomeSense Novel         Books  374.16
8       P020        38      ActiveWear Jacket     Clothing  396.34
9       P028        38    HomeSense Desk Lamp   Home Decor  235.58
```


Top 10 Popular Products by Quantity Sold