

ShopEase Business Analysis Report

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| Project Title | Week 1 - Project - Data Analysis for Business Insights |

Week 1 - Project: Data Analysis for Business Insights

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1. Executive Summary

This report presents an in-depth analysis of ShopEase's sales data to identify key trends, customer behavior, and opportunities for business growth. Our Exploratory Data Analysis (EDA) has revealed insights into sales trends, customer preferences, and payment methods, which have been leveraged to provide actionable recommendations. The findings emphasize the importance of focusing on high-performing product categories, improving customer engagement strategies, and optimizing payment methods to enhance the overall business performance.

Dataset Info:

```
<class 'pandas.core.frame.DataFrame'>
```

RangeIndex: 20 entries, 0 to 19

Data columns (total 10 columns):

| # | Column | Non-Null Count | Dtype |
|---|----------------|----------------|---------|
| 0 | Transaction_ID | 20 non-null | int64 |
| 1 | Date | 20 non-null | object |
| 2 | Customer_ID | 20 non-null | object |
| 3 | Product | 20 non-null | object |
| 4 | Category | 20 non-null | object |
| 5 | Quantity | 20 non-null | int64 |
| 6 | Price | 20 non-null | int64 |
| 7 | Total_Amount | 19 non-null | float64 |
| 8 | Payment_Method | 20 non-null | object |
| 9 | Region | 20 non-null | object |

dtypes: float64(1), int64(3), object(6)

memory usage: 1.7+ KB

None

First 5 Rows:

| | Transaction_ID | Date | Customer_ID | Product | Category | Quantity \ |
|---|----------------|------------|-------------|------------|-------------|------------|
| 0 | 1001 | 2024-01-05 | C001 | Laptop | Electronics | 1 |
| 1 | 1002 | 2024-01-10 | C002 | Smartphone | Electronics | 2 |
| 2 | 1003 | 2024-01-12 | C003 | Headphones | Electronics | 1 |
| 3 | 1004 | 2024-02-05 | C004 | Tablet | Electronics | 1 |
| 4 | 1005 | 2024-02-08 | C005 | Book | Books | 3 |

| | Price | Total_Amount | Payment_Method | Region |
|---|-------|--------------|----------------|--------|
| 0 | 800 | NaN | Credit Card | North |
| 1 | 600 | 1200.0 | Cash | South |
| 2 | 100 | 100.0 | PayPal | West |
| 3 | 500 | 500.0 | Debit Card | East |
| 4 | 20 | 60.0 | Credit Card | North |

Missing Values Count:

| | |
|----------------|---|
| Transaction_ID | 0 |
| Date | 0 |
| Customer_ID | 0 |
| Product | 0 |
| Category | 0 |
| Quantity | 0 |
| Price | 0 |
| Total_Amount | 1 |
| Payment_Method | 0 |
| Region | 0 |

dtype: int64

Duplicate Rows Count: 0

Duplicate Rows Count: 0

Summary Statistics:

| | Transaction_ID | Date | Customer_ID | Product | Category \ |
|--------|----------------|------------|-------------|---------|-------------|
| count | 20.00000 | 20 | 20 | 20 | 20 |
| unique | NaN | 20 | 18 | 8 | 3 |
| top | NaN | 2024-01-05 | C001 | Laptop | Electronics |
| freq | NaN | 1 | 2 | 3 | 13 |
| mean | 1010.50000 | NaN | NaN | NaN | NaN |
| std | 5.91608 | NaN | NaN | NaN | NaN |
| min | 1001.00000 | NaN | NaN | NaN | NaN |
| 25% | 1005.75000 | NaN | NaN | NaN | NaN |
| 50% | 1010.50000 | NaN | NaN | NaN | NaN |
| 75% | 1015.25000 | NaN | NaN | NaN | NaN |
| max | 1020.00000 | NaN | NaN | NaN | NaN |

| | Quantity | Price | Total_Amount | Payment_Method | Region |
|--------|-----------|------------|--------------|----------------|--------|
| count | 20.000000 | 20.000000 | 19.000000 | 20 | 20 |
| unique | NaN | NaN | NaN | 4 | 4 |
| top | NaN | NaN | NaN | Credit Card | North |
| freq | NaN | NaN | NaN | 6 | 6 |
| mean | 1.550000 | 325.500000 | 375.263158 | NaN | NaN |
| std | 0.887041 | 302.484884 | 389.067524 | NaN | NaN |
| min | 1.000000 | 20.000000 | 25.000000 | NaN | NaN |
| 25% | 1.000000 | 43.750000 | 77.500000 | NaN | NaN |
| 50% | 1.000000 | 200.000000 | 200.000000 | NaN | NaN |
| 75% | 2.000000 | 600.000000 | 550.000000 | NaN | NaN |
| max | 4.000000 | 800.000000 | 1200.000000 | NaN | NaN |

Objective: To analyze sales data for ShopEase to improve sales performance and customer satisfaction.

Cleaned Dataset

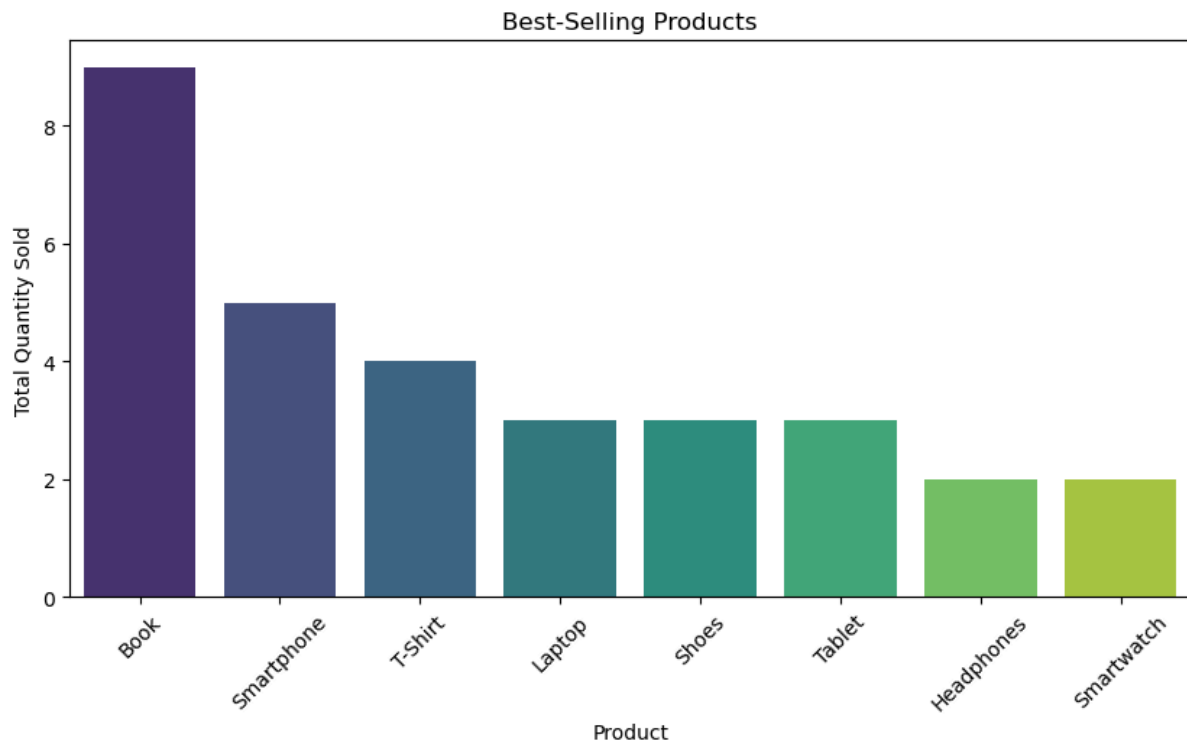
Steps Completed:

- Inspected dataset structure and identified columns.
- Removed duplicates (none found).
- Handled missing values in the **Total_Amount** column.
- Standardized date formats to YYYY-MM-DD.

Summary:

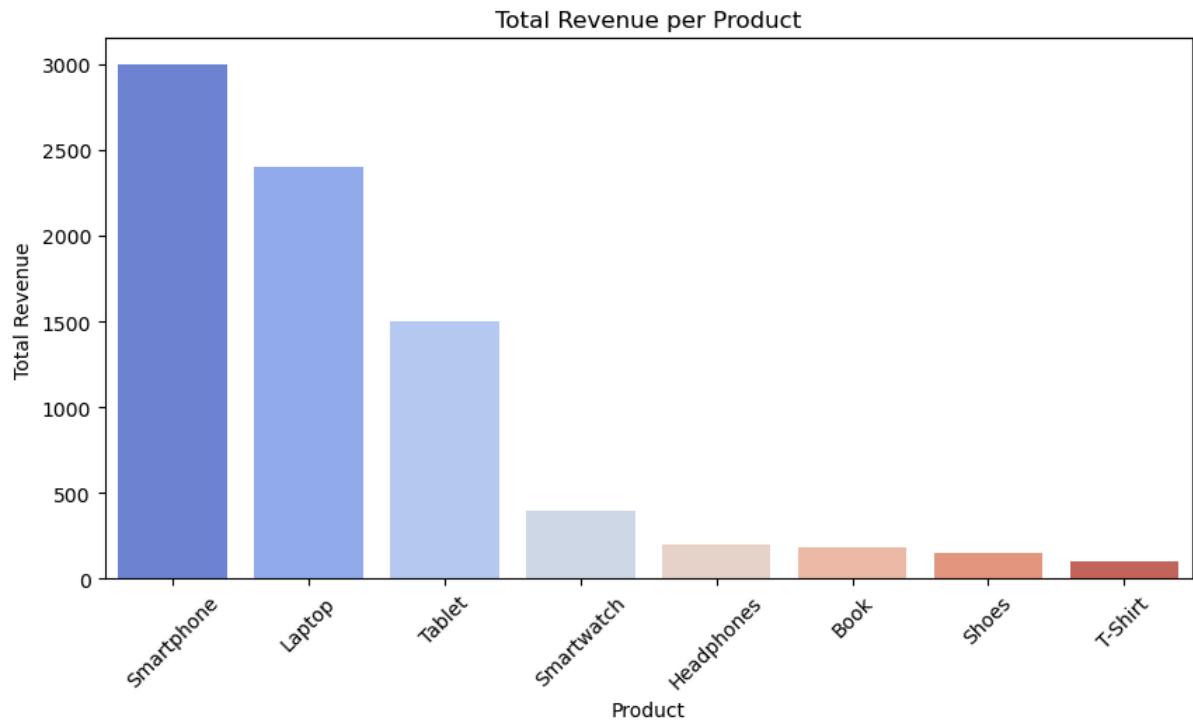
- The dataset is clean, with no duplicates and missing values addressed.
- Dates standardized for consistency.

2. Sales Trends Analysis



Best-Selling and High-Revenue Products:

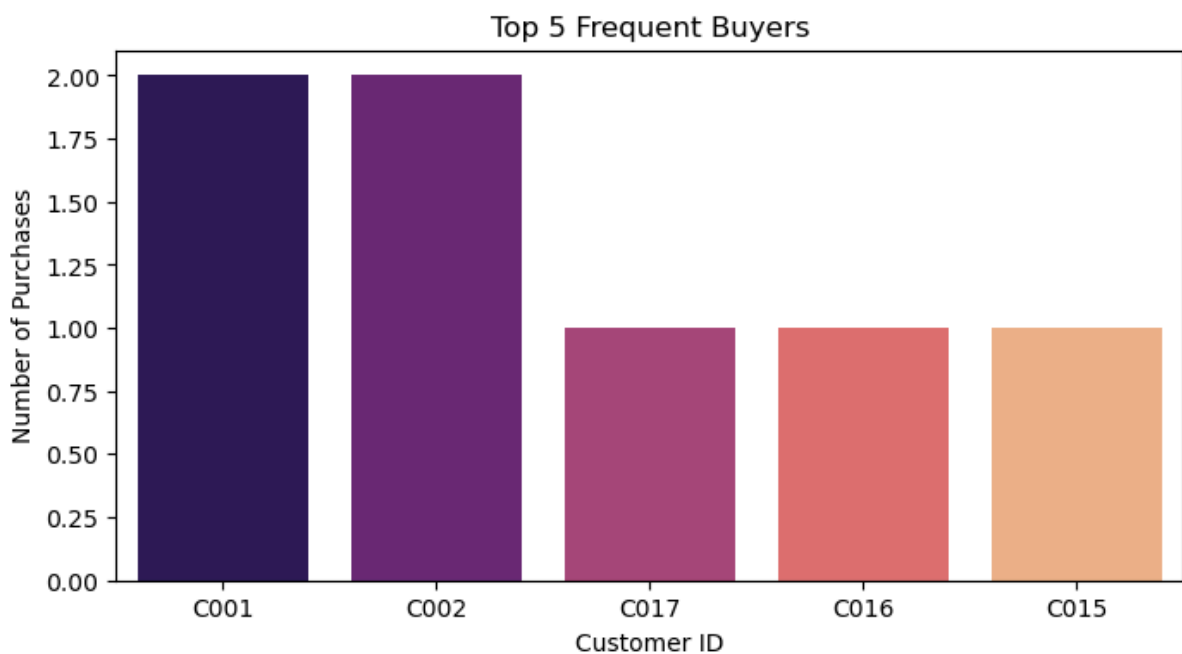
- Smartphones: Highest-selling product and top revenue generator, indicating strong customer demand and profitability.
- Laptops & Tablets: Generate high revenue despite moderate sales, suggesting premium pricing impacts revenue positively.
- Books & T-Shirts: High in sales volume but lower in revenue, indicating the need for pricing or bundling strategies to enhance profitability.



Observation of Total Revenue per Product

- **Smartphone:** Generates the highest total revenue among all products, indicating its strong demand and profitability.
- **T-Shirt:** Generates the lowest total revenue, suggesting it may have lower demand or a lower price point compared to other products.

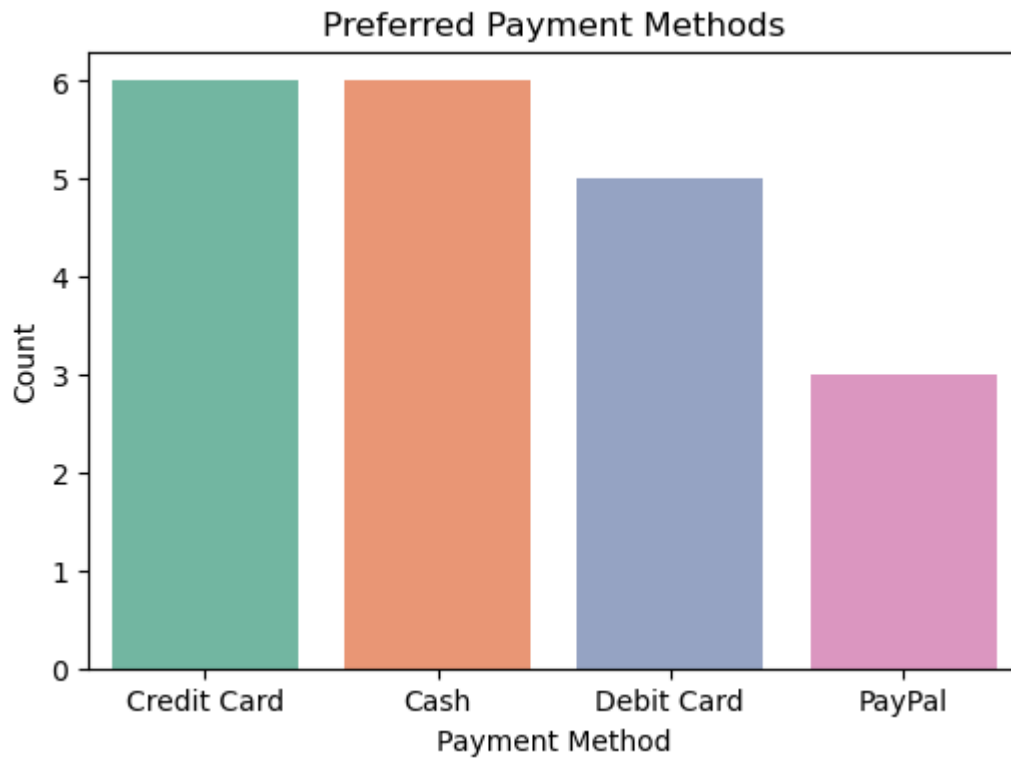
3. Customer Insights & Payment Preferences



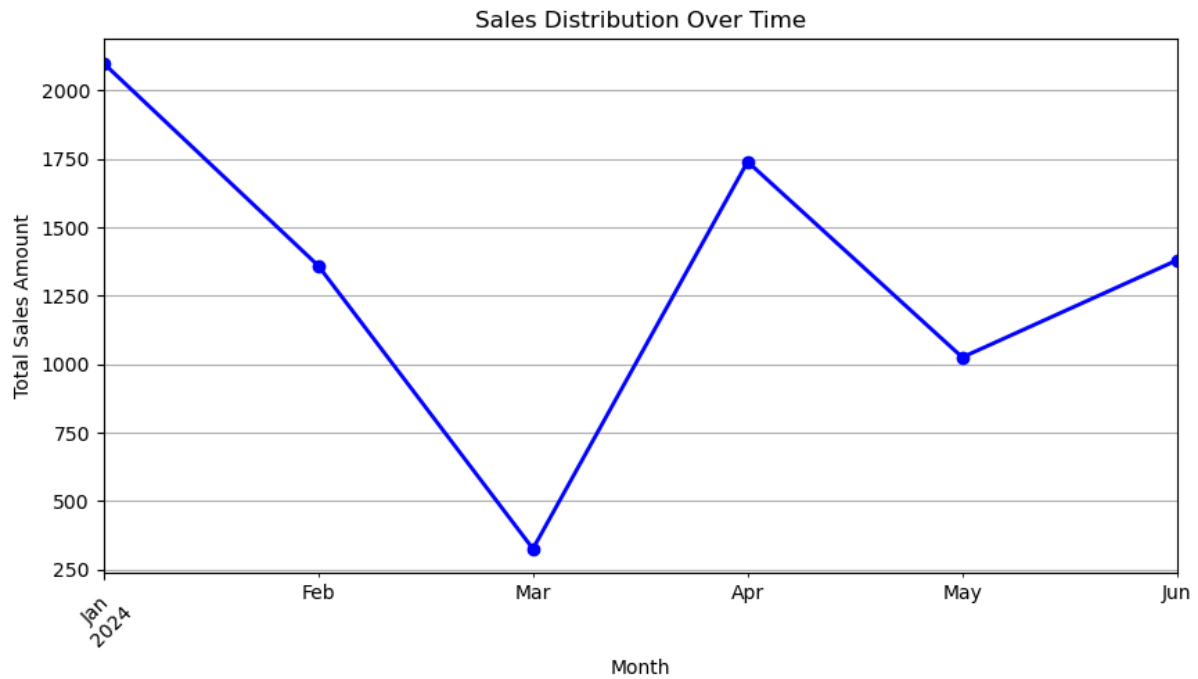
Top Frequent Buyers:

- C001 & C002: Most engaged customers, making repeat purchases. Rewarding their loyalty could enhance retention.
- C017, C016 & C015: Moderate engagement, requiring targeted marketing to increase purchase frequency.

Preferred Payment Methods:



- Credit Card & Cash: Equally preferred, indicating a need for seamless transaction experiences.
- Debit Card: Second most used method, showing strong traditional banking reliance.
- PayPal: Least preferred, requiring improvements in ease of use or promotional incentives to increase adoption.



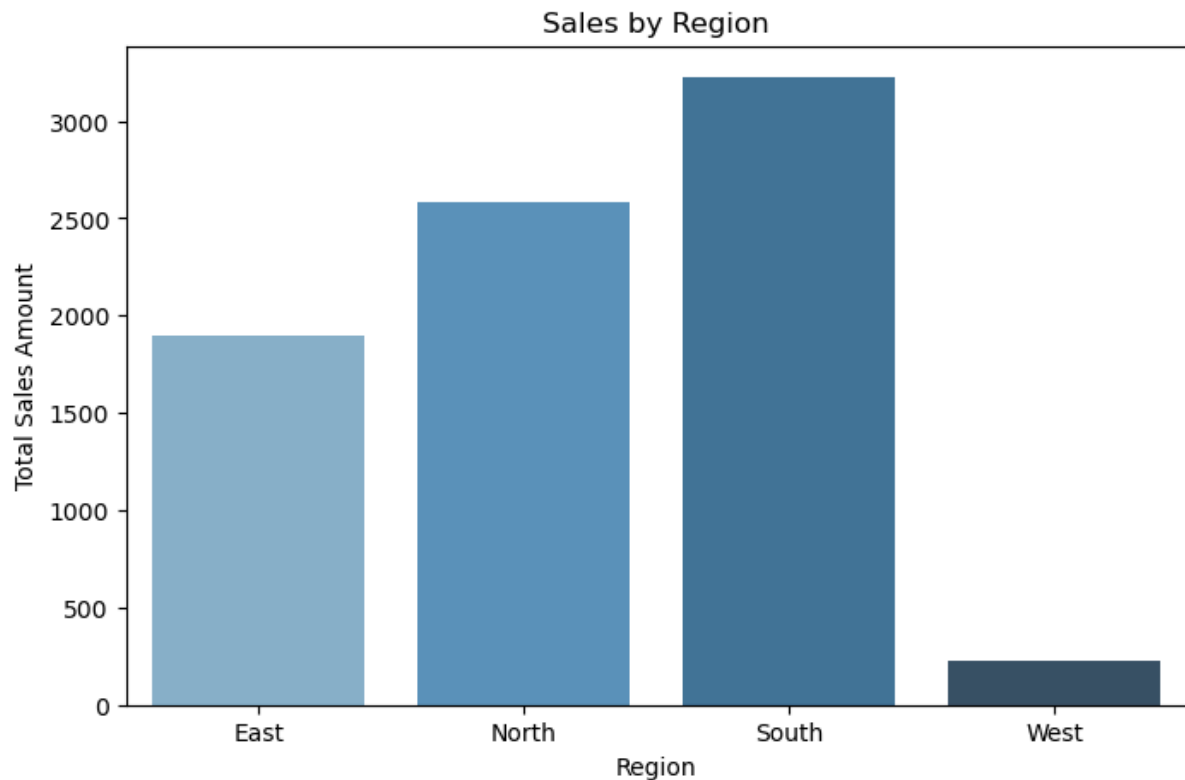
Sales Distribution Over Time

Peak Sales in January:

- Sales reached their highest point at 2000 in January 2024, indicating a strong start to the year, likely driven by New Year promotions and consumer spending.

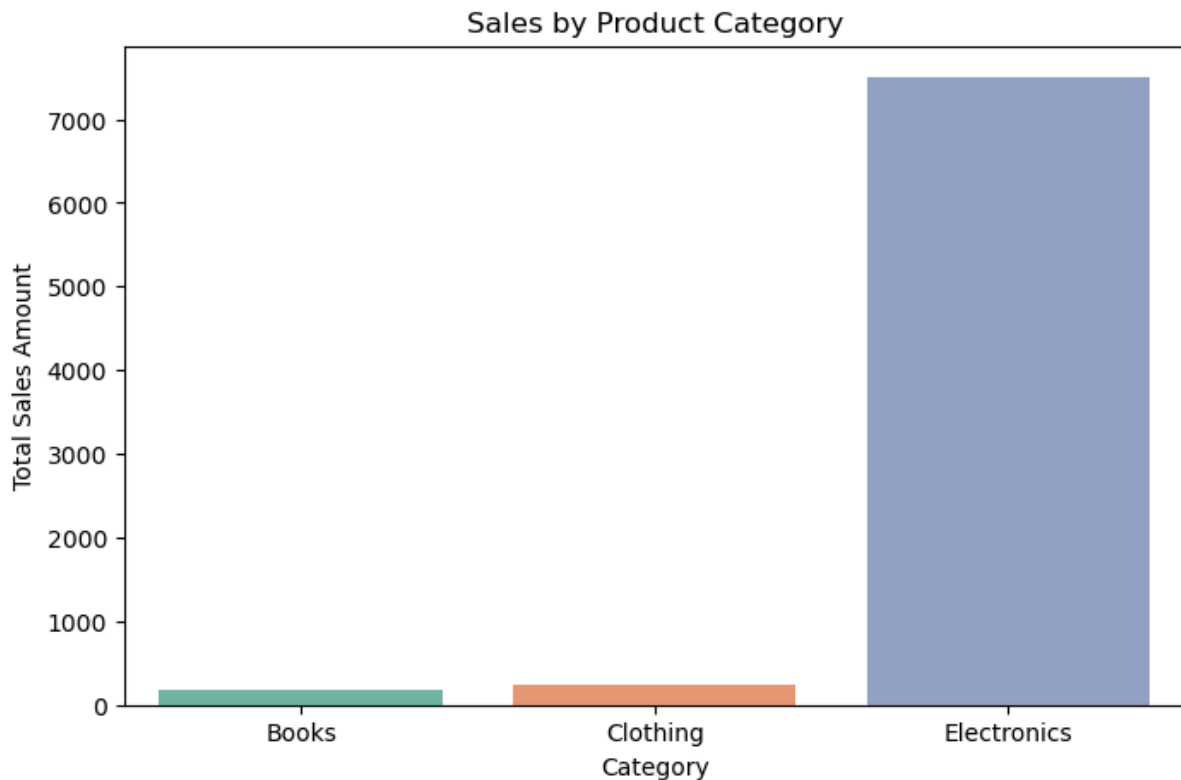
Significant Sales Drop in February and March:

- Sales decreased to 1250 in February and dropped significantly to 250 in March, suggesting a post-holiday slump and a need for strategies to maintain consistent revenue during these months.



Sales by Region

- Highest Sales Region:
 - South Region: The South region has the highest total sales amount, exceeding 3000 units.
- Lowest Sales Region:
 - West Region: The West region has the lowest total sales amount, with sales just above 500 units.



Sales by Product Category

- Electronics: This category has the highest sales amount, significantly higher than Books and Clothing. The total sales amount for Electronics is over 7000.
- Books and Clothing: Both categories have sales amounts below 1000, indicating they are less popular or generate less revenue compared to Electronics.

4. Key Business Insights

- Smartphones: Drive both volume and revenue, making them a key focus area for inventory and marketing strategies.
- Laptops and Tablets: Contribute significantly to revenue, justifying premium pricing strategies.
- Books and Clothing: Popular but have lower revenue impact, requiring strategic bundling or upselling.
- Regional Variations: The South region is the strongest market, suggesting further investment in localized marketing.
- Loyal Customers: Can be leveraged for repeat purchases through rewards, loyalty programs, and personalized marketing.
- Payment Method Diversity: Ensuring smooth processing for Credit Card and Cash transactions is crucial.

5. Recommendations & Strategic Actions

1. Focus on High-Performing Products & Inventory Optimization:
 - Increase inventory for smartphones, laptops, and tablets to meet demand.
 - Introduce strategic bundling of books and T-shirts with premium products to improve revenue.
2. Regional Marketing & Expansion:
 - Enhance promotions in the South region to capitalize on strong sales.
 - Explore region-specific pricing and discounts to drive engagement in underperforming regions.
3. Seasonal Promotions to Stabilize Revenue:
 - Maximize January sales with promotional campaigns and stock readiness.
 - Boost sales in February and March through limited-time offers, flash sales, and targeted discounts.
4. Customer Engagement & Loyalty Programs:
 - Implement personalized loyalty rewards for frequent buyers (C001 & C002) to encourage continued purchases.
 - Design targeted marketing campaigns for less frequent buyers to increase retention and engagement.
5. Payment Method Optimization:
 - Ensure seamless transactions for Credit Card and Cash payments as they are the most preferred methods.
 - Improve PayPal experience or offer incentives to drive adoption among customers preferring digital payments.

6. Conclusion

By leveraging these insights, ShopEase can enhance its product strategy, marketing approach, and customer engagement initiatives. Focusing on high-performing products, optimizing payment experiences, and implementing data-driven promotions will contribute to long-term revenue growth and improved customer satisfaction.