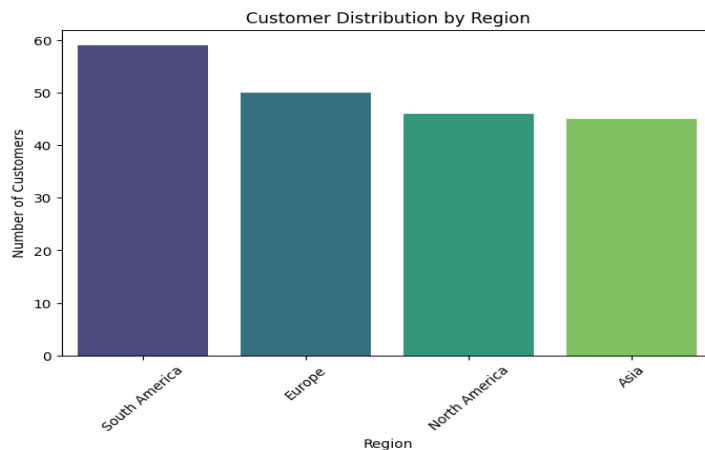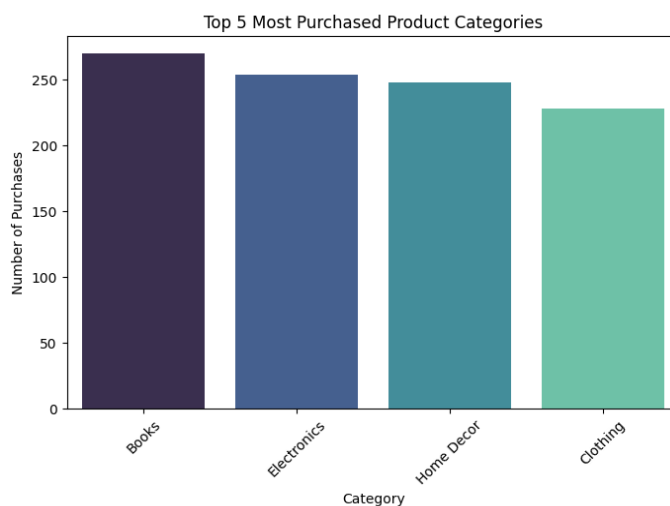# Business Insights from EDA on E-Commerce Transactions Dataset

## 1. Regional Distribution:



- Customers are unevenly distributed across regions.
- Targeted regional campaigns can help increase market share in underrepresented areas.

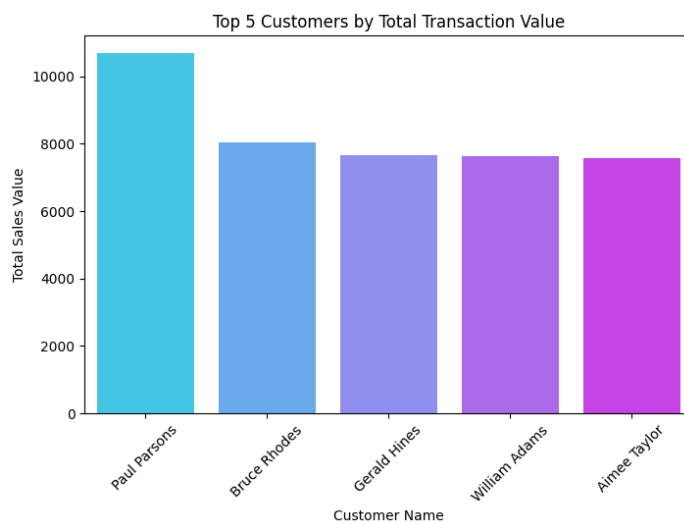## 2. Popular Product Categories:



- The top 5 purchased product categories indicate strong consumer preferences.
- Increasing inventory and promotions for these categories can boost sales.

## 3. Monthly Sales Trends:
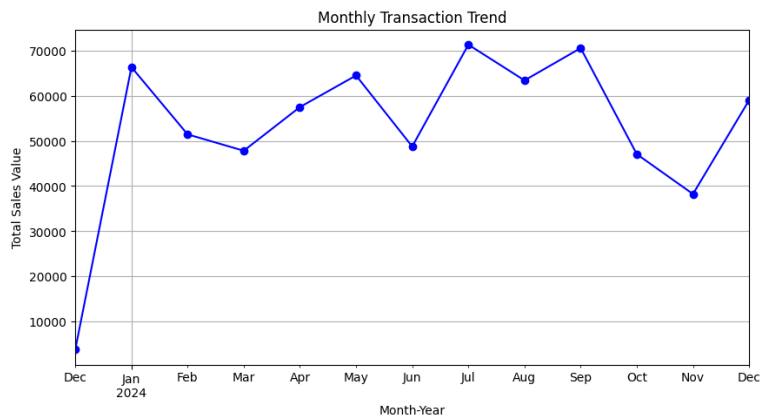


- Sales show seasonal fluctuations.
- Analyzing peak months can guide the timing of promotions and stock replenishment.

## 4. High-Value Customers:



- The top 5 customers contribute significantly to revenue.
- Offering loyalty rewards to these customers can enhance retention and drive further purchases.

## 5. Average Transaction Value:

```
average_transaction_value = transactions_df['TotalValue'].mean()
print(f"Average Sales Value Per Transaction: {average_transaction_value}")
✓ 0.0s
Average Sales Value Per Transaction: 689.9955600000001
```

- The average sales value per transaction is ₹690, serving as a benchmark for evaluating future sales strategies and performance.

## 6. Product Performance Analysis:

*Identify underperforming products (below the 25th percentile in sales)*

```
     ProductID  TotalRevenue  QuantitySold
2        P003       1367.72            31
3        P004       1722.42            18
7        P008       2790.15            19
11       P012       2394.00            15
13       P014        367.64            14
14       P015       2860.74            18
25       P026       1223.22            19
30       P031       1767.60             9
32       P033       1413.50            22
34       P035        795.34            26
43       P044        244.66            13
50       P051       1694.16            26
53       P054       2635.80            46
55       P056        337.68            21
59       P060       2023.45            13
62       P063        839.75            25
68       P069       2419.44            24
69       P070        730.35            15
70       P071       2547.20            20
72       P073        647.76            24
77       P078       1070.68            26
80       P081       2188.56            33
81       P082       1063.81            19
89       P090       2314.20            14
99       P100       1895.10            15
```

- By recognizing underperforming products, we can adjust stock levels, avoid overstocking, and allocate resources to better-performing products.
- Investigate why products are underperforming (e.g., low customer demand, ineffective marketing). Take corrective actions like improving product features, running promotional campaigns, or making pricing adjustments.

## 7. Customer Retention Metrics

```
Retention Rate: 93.97%
Average Days Between Purchases: 55.38
```

- **Retention Rate: 93.97%**
  This indicates that 93.97% of customers continue to make purchases over a specific period, showing strong customer loyalty and satisfaction.

- **Average Days Between Purchases: 55.38**
  On average, customers are returning to make a new purchase every 55.38 days, which suggests a steady level of customer engagement and suggests that customers are relatively active and satisfied with their previous purchase.