Sameer Ahmed ML Assignment

Business Insights

1. Customer Signups Over Time (Bar Chart)

Key Insights from Customer Growth Trend:

- Consistent year-over-year growth in customer signups
- 2022: ~63 signups
- 2023: ~57 signups
- 2024: ~78 signups
- Significant growth spike in 2024 (approximately 37% increase from 2023)
- Potential factors: improved marketing, market expansion, or successful referral programs
- Slight dip in 2023 suggests possible market challenges or reduced marketing efforts that year

2. Most Popular Product Categories (Bar Chart)

Key Insights from Product Categories:

- Books leads with ~26 count
- Electronics follows closely with ~25 count
- Clothing at ~24 count
- Home Decor trails at ~22 count
- Relatively even distribution across categories suggests:
 - Balanced inventory management
 - Diverse product mix strategy
 - Opportunity to boost Home Decor performance
 - Strong performance in knowledge products (Books)

3. Monthly Revenue Trend (Line Graph)

Key Insights from Revenue Trends:

- Significant revenue volatility throughout the year
- Peak revenue periods:
 - July 2024 (~70,000 USD)
 - September 2024 (~70,000 USD)
- Notable low points:
 - December 2023 (~5,000 USD)
 - November 2024 (~38,000 USD)
- Clear seasonal patterns with summer months showing stronger performance
- Concerning end-of-year decline in November-December.

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4. Customer Distribution by Region (Pie Chart)

Key Insights from Regional Distribution:

- South America: 29.5% (largest market share)

- Europe: 25.0%

- North America: 23.0%

Asia: 22.5%Observations:

- Well-balanced global presence
- Surprisingly strong South American market
- Relatively lower Asian market share despite population size
- Almost even split between western (NA + EU = 48%) and eastern markets

5. Top 10 Customers by Total Spending (Bar Chart)

Key Insights from Customer Spending:

- Highest spender (C0141): ~10,000 USD
- Second highest (C0054): ~8,000 USD
- Significant gap between top and bottom spenders:
 - Top spender: ~10,000 USD
 - 10th place (C0165): ~6,500 USD
- Clear spending hierarchy with gradual decline
- Top 3 customers account for disproportionate revenue share
- Suggests need for:
 - VIP customer retention program
 - Strategy to develop more high-value customers
 - Risk management for revenue concentration

SUMMARY:

Customer Signups Over Time:

- The customer signups have shown consistent growth each year. In 2024, there was a notable 37% increase from 2023, likely due to better marketing efforts, market expansion, or referral programs. The slight dip in 2023 could indicate some challenges, possibly related to reduced marketing or market conditions. Sameer Ahmed ML Assignment

Most Popular Product Categories:

- The product distribution is fairly even, with Books leading at ~26, followed by Electronics (~25), and Clothing (~24). Home Decor is trailing (~22), suggesting an opportunity for improvement in that category. This balance reflects strong inventory management and a diverse product mix, with a particular strength in knowledge-based products (Books).

Monthly Revenue Trend:

- Revenue fluctuated throughout the year, with significant peaks in July (~70,000 USD) and September (~70,000 USD). However, December 2023 (~5,000 USD) and November 2024 (~38,000 USD) saw considerable drops, with a clear seasonal pattern where summer months performed better. The end-of-year decline is a concern and may warrant further investigation into factors causing these dips.

Customer Distribution by Region:

- The global presence is relatively well-balanced, with South America (29.5%) holding the largest share, followed by Europe (25%), North America (23%), and Asia (22.5%). The surprising strength in South America and the relatively small share in Asia despite its large population calls for deeper market exploration. The split between Western (NA + EU) and Eastern markets (Asia) is almost even, indicating diverse regional engagement.

Top 10 Customers by Total Spending:

- The customer spending data shows a clear hierarchy, with the top spender contributing ~10,000 USD. There's a significant gap between the top and bottom spenders. The top 3 customers account for a large portion of the revenue, which emphasizes the need for a VIP customer retention program and strategies to cultivate more high-value customers to reduce the risk of revenue concentration.