

Analytical Summary

Project Title: UrbanMart Retail Optimization Analysis

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Tool: Python (Pandas, Matplotlib, Seaborn)

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1. Introduction

This document presents the exploratory analysis and KPI calculations performed as part of the UrbanMart Retail Optimization Project. Using Python, I examined patterns in sales, customer behavior, and discounting. The analysis was conducted on a cleaned and enriched version of the Sample Superstore dataset.

2. Exploratory Data Analysis

See: `EDA.ipynb` and `EDA_Superstore.xlsx` for code

The EDA was structured to answer key business questions:

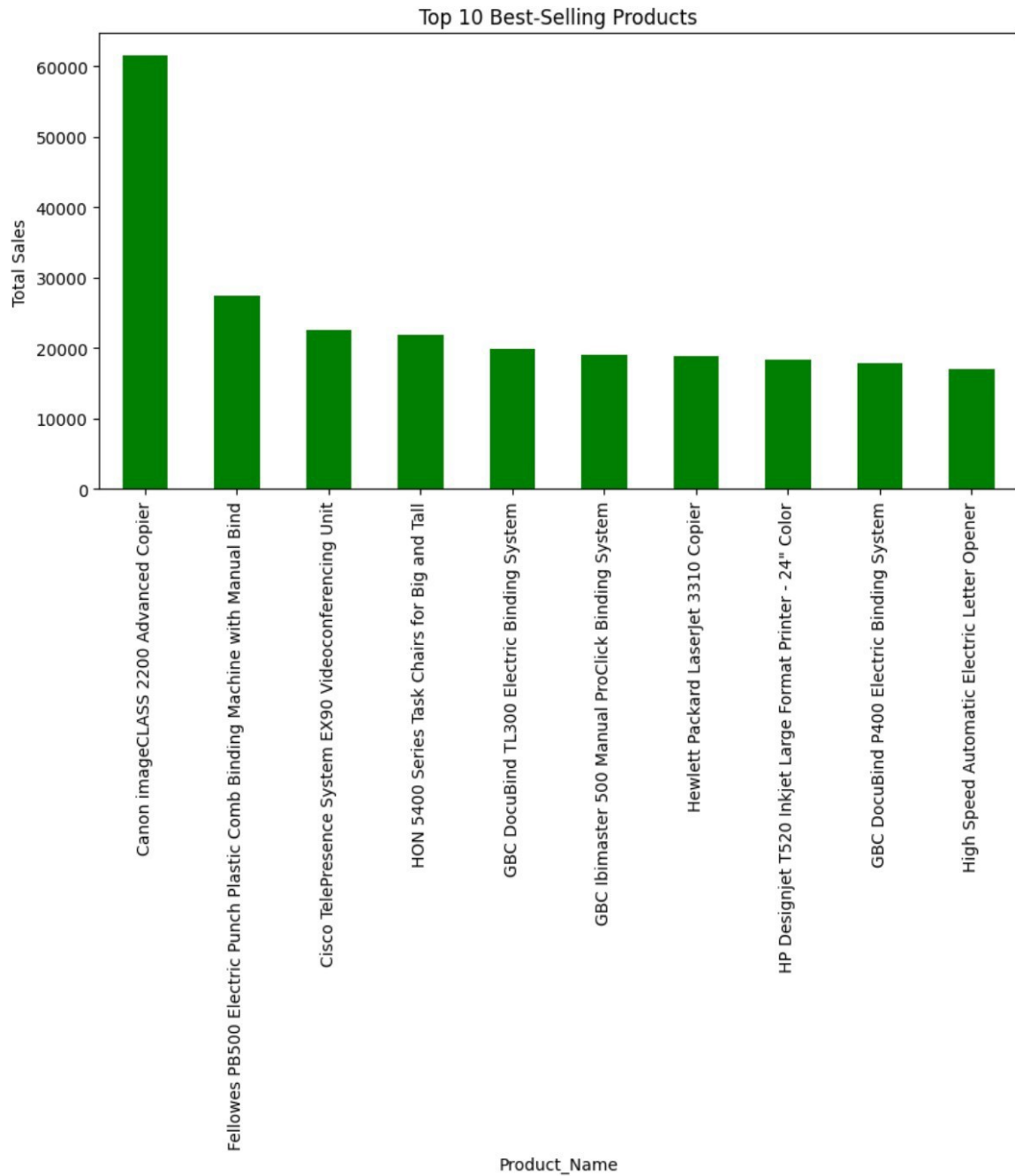
- **Top-Selling Products**

The **Canon imageCLASS 2200 Advanced Copier** generated over **\$61K** in total sales – significantly outperforming all other products and indicating clear market demand. Most of the remaining top sellers are high-value office equipment, particularly binding and printing systems, suggesting strong traction with the corporate customer segment. These products should be prioritized for inventory planning, promotional campaigns, and potential bundling strategies to maximize revenue impact.

Top 10 Best-Selling Products:

Product_Name	
Canon imageCLASS 2200 Advanced Copier	61599.824
Fellowes PB500 Electric Punch Plastic Comb Binding Machine with Manual Bind	27453.384
Cisco TelePresence System EX90 Videoconferencing Unit	22638.480
HON 5400 Series Task Chairs for Big and Tall	21870.576
GBC DocuBind TL300 Electric Binding System	19823.479
GBC Ibimaster 500 Manual ProClick Binding System	19024.500
Hewlett Packard LaserJet 3310 Copier	18839.686
HP Designjet T520 Inkjet Large Format Printer – 24" Color	18374.895
GBC DocuBind P400 Electric Binding System	17965.068
High Speed Automatic Electric Letter Opener	17030.312

Name: Sales, dtype: float64



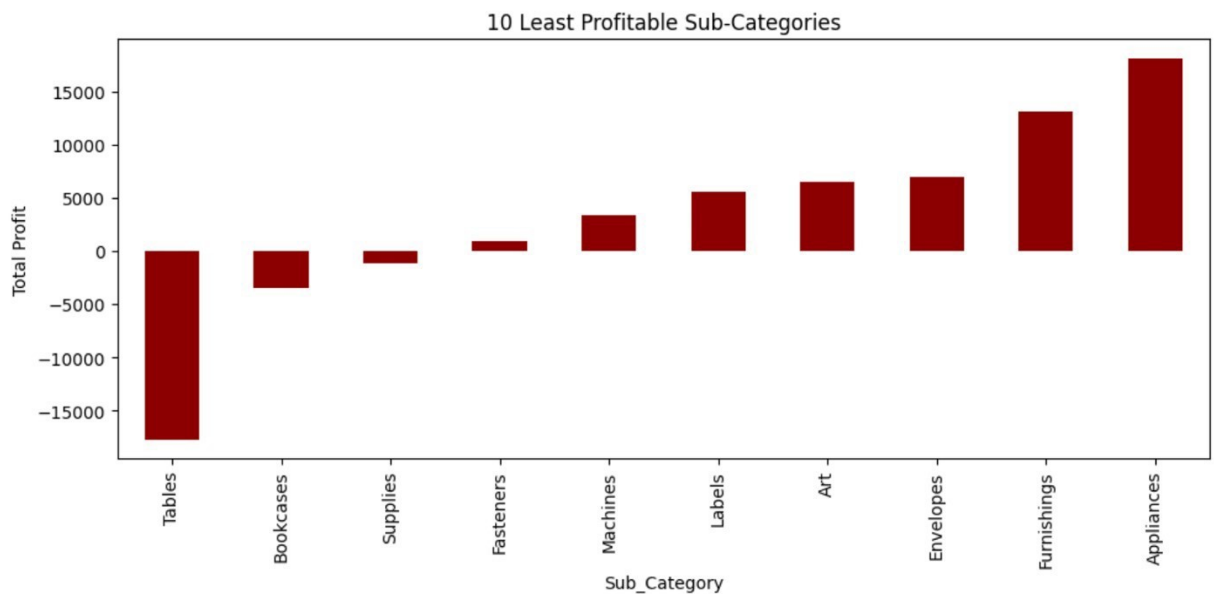
- **Least Profitable Sub-Categories**

Despite contributing to overall sales, **Tables**, **Bookcases**, and **Supplies** resulted in **net losses**, with Tables alone showing a negative profit of over **\$17,700**. These losses are likely driven by high discount rates, low margins, or inventory inefficiencies. These sub-categories should be prioritized for review — either through pricing strategy revision, supplier renegotiation, or potential phase-out to avoid continued margin erosion.

Least Profitable Sub-Categories:

Sub_Category	Profit
Tables	-17725.4811
Bookcases	-3472.5560
Supplies	-1189.0995
Fasteners	949.5182
Machines	3384.7569
Labels	5546.2540
Art	6527.7870
Envelopes	6964.1767
Furnishings	13059.1436
Appliances	18138.0054

Name: Profit, dtype: float64



- **Customer Segment Analysis**

The **Consumer segment** generated the highest total sales (\$1.16M) and profit (\$134K), making it the company's primary revenue engine. The **Home Office segment** demonstrated a strong profit-to-sales ratio, with ~\$60K in profit from ~\$430K in sales — indicating healthy margins and pricing efficiency.

In contrast, the **Corporate segment** brought in ~\$706K in sales but only ~\$92K in profit, which is proportionally lower than the other segments. This suggests **lower profitability per dollar sold**, likely due to **bulk discounts, negotiated pricing, or higher return rates** typical

in B2B contracts. A focused review of pricing policies and customer-specific deal structures in this segment could improve its profit contribution.

Segment Performance:

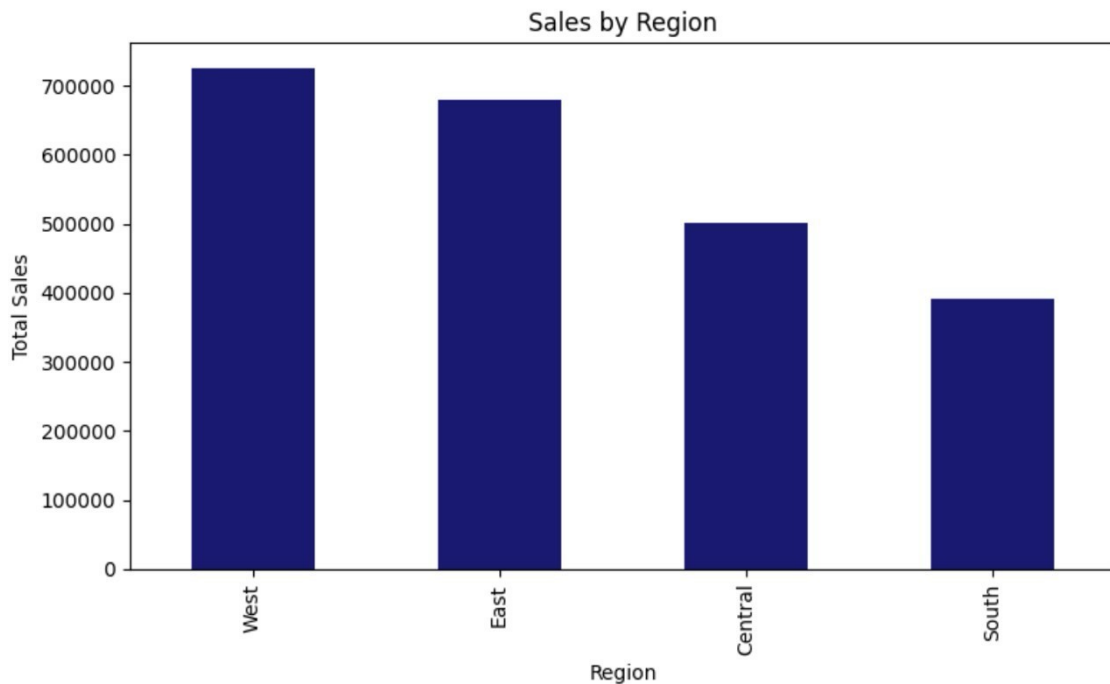
	Sales	Profit
Segment		
Consumer	1.161401e+06	134119.2092
Corporate	7.061464e+05	91979.1340
Home Office	4.296531e+05	60298.6785



- Regional Sales Performance

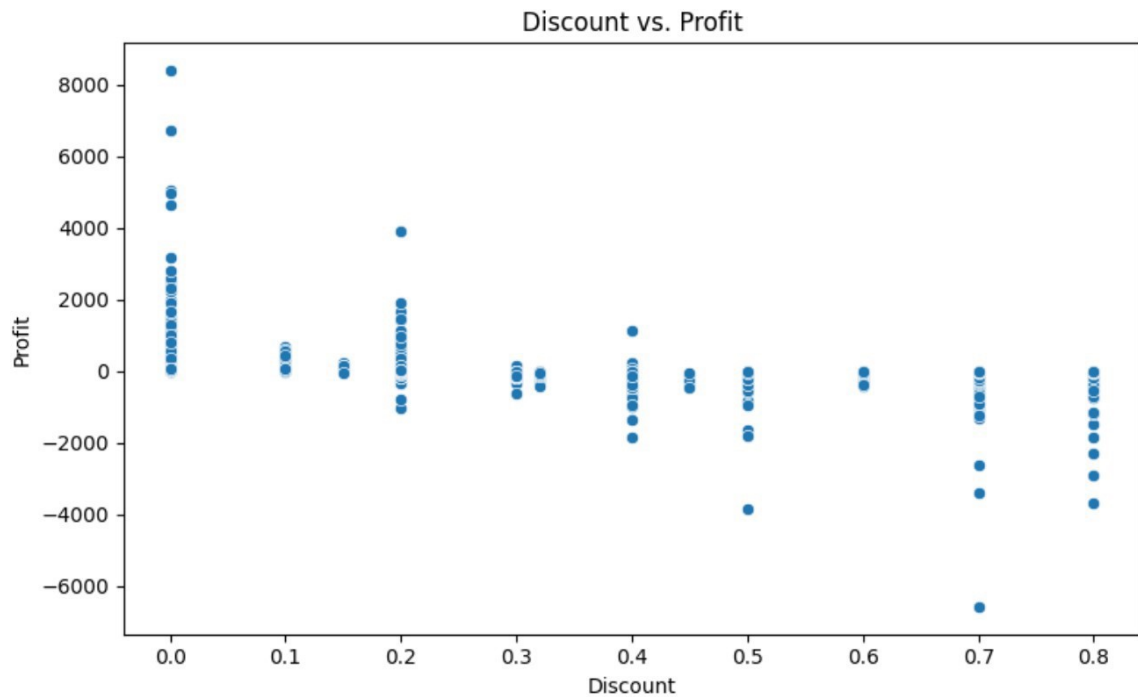
The **West region** leads all markets with over **\$725K** in total sales, followed closely by the **East** at ~\$678K. In contrast, the **South region** lags significantly behind with only ~\$392K in revenue. This geographic gap highlights a potential **underperformance or untapped market** opportunity in the South. A focused regional strategy — including deeper analysis of customer preferences, pricing competitiveness, and marketing reach in the South — could help rebalance regional performance and uncover missed revenue.

```
Sales by Region:
Region
West      725457.8245
East      678781.2400
Central   501239.8908
South     391721.9050
Name: Sales, dtype: float64
```



- **Discount vs Profit**

The scatter plot reveals a clear negative relationship between **discount levels** and **profitability**. While modest discounts (~0.1–0.2) yield mixed outcomes, higher discounts — especially above **30%** — are consistently associated with **negative profit margins**. This suggests that aggressive discounting strategies are eroding margins rather than driving profitable volume. A data-driven discount policy is recommended, including **setting discount ceilings** and **tracking profit impact** across products and customer segments.



3. KPI Calculations

See: `'KPI_Calculation.ipynb'` for full code and logic

KPI	Formula	Result
Gross Revenue	<code>`df['Sales'].sum()`</code>	~\$2.3M
Total Profit	<code>`df['Profit'].sum()`</code>	~\$286K
Profit Margin	<code>`Profit / Sales`</code>	~12.5%
Average Order Value (AOV)	<code>`sum(Sales) / number of orders`</code>	~\$458
Sales by Category	<code>`groupby('Category')['Sales'].sum()`</code>	Tech > Furniture > Supplies

Key performance indicators (KPIs) were computed to evaluate UrbanMart's overall financial health and operational efficiency.

- **Gross Revenue** totaled approximately **\$2.3 million**, confirming strong top-line performance.
- **Total Profit** was calculated at **~\$286K**, resulting in a **profit margin of ~12.5%**, which is solid but could benefit from margin protection strategies.

- The **Average Order Value (AOV)** stood at approximately **\$458**, suggesting that most transactions are driven by **bulk or high-ticket items** — consistent with B2B buying behavior.
- Category-level KPIs confirmed that **Office Supplies** and **Technology** are revenue leaders, while **Furniture** showed weaker performance both in revenue and turnover.