# Sales and Profit Analysis of a Superstore

## Objective

The objective of this project is to analyze the sales and profit data of a superstore using Python and the Exploratory Data Analysis (EDA) process. The goal is to identify trends, key drivers of revenue, and areas of improvement while providing actionable insights to improve business performance.

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## Dataset Overview

The dataset contains 9,994 rows and 21 columns, including details such as order date, ship date, customer information, product categories, sub-categories, sales, quantity, discounts, and profits.

Key Columns:

- **Sales**: Total revenue generated from each order.
- **Profit**: The profit margin for each transaction.
- **Category** and **Sub-Category**: Classifications of products sold.
- **Segment**: Customer segments (Consumer, Corporate, Home Office).

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## Analysis and Findings

### 1. Monthly Sales and Profit Analysis

- Monthly sales trends showed a gradual increase, with peaks in specific months like **November and December** due to holiday shopping.
- The highest monthly profit of **$43,369.19 (18.5%)** was recorded in **December**, while the lowest profit of **$9,134.45 (3.9%)** was in January.
- Seasonal sales spikes suggest increased demand during the holiday season.

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### 2. Yearly Sales and Profit Trends

- Sales consistently grew year over year:
    - **2014**: $484,247.48
    - **2015**: $531,566.93 (**9.8% increase**)
    - **2016**: $656,016.41 (**23.4% increase**)
    - **2017**: $733,215.87 (**11.8% increase**)
- This indicates strong business expansion and increased customer reach over the years.

### 3. Sales and Profit by Category

- **Sales Distribution**:
    - **Technology**: $836,154.03 (36.4%)
    - **Furniture**: $741,999.80 (32.3%)
    - **Office Supplies**: $719,047.03 (31.3%)
- **Profit Contribution**:
    - **Technology**: $145,454.95 (50.8%)
    - **Office Supplies**: $122,490.80 (42.8%)
    - **Furniture**: $18,451.27 (6.4%)
- Despite high sales, Furniture's profit margin was significantly lower, indicating possible inefficiencies or higher discounting.

### 4. Sub-Category Insights

- **Top Performing Sub-Categories by Sales**:
    - **Phones**: $330,007.05
    - **Chairs**: $328,449.10
    - **Storage**: $223,843.61
- **Underperforming Sub-Categories by Sales and Profit**:
    - **Fasteners**: $3,024.28 (lowest sales, negligible profits).
    - **Tables**: Significant losses of **-$383,031.00**, contributing negatively to overall profitability.
    - These sub-categories require optimization in pricing, inventory, or marketing strategies.

### 5. Customer Segment Analysis

- **Sales and Profit Distribution**:
    - **Consumers**: $1,310,000.00 sales, $151,343.96 profit (8.7% sales-to-profit ratio).
    - **Corporate**: $721,000.00 sales, $94,000.00 profit (7.7% ratio).
    - **Home Office**: $467,000.00 sales, $65,600.00 profit (7.1% ratio).
- Consumers generated the highest sales and profit, but the sales-to-profit ratio was slightly lower, highlighting room for improvement in cost efficiency.

### 6. Visual Insights

- **Line Graphs** for monthly and yearly trends clearly illustrated the seasonal and yearly performance growth.

- **Pie Charts** showed proportional sales and profit contributions by category, highlighting the dominance of Technology.
- **Bar Charts** detailed sub-category performance, pinpointing areas of success and concern.

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**Key Insights and Recommendations**

1. **Focus on Technology**:
   - Technology accounts for the highest profit (50.8%). Marketing and inventory for this category should be prioritized to further boost revenue.
2. **Address Furniture's Low Profitability**:
   - Furniture's profit contribution (6.4%) is disproportionately low compared to its sales share (32.3%). Investigate causes like pricing strategies, high discounts, or operational inefficiencies.
3. **Improve Loss-Making Sub-Categories**:
   - Sub-categories like **Tables** and **Fasteners** need strategic intervention to reduce losses, potentially by reviewing pricing or discontinuing low-demand items.
4. **Leverage Seasonal Peaks**:
   - Maximize marketing campaigns during **November and December**, as they account for the highest sales and profits.
5. **Enhance Profitability in Consumer Segment**:
   - The Consumer segment drives the most sales but has a slightly lower profit efficiency (8.7%). Evaluate costs and optimize pricing strategies for better margins.

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**Conclusion**

This project effectively utilized Python and EDA to provide actionable insights into the sales and profit performance of a superstore. By identifying trends and underperforming areas, it offers a data-driven foundation for strategic business decisions. The visualizations created further simplify understanding and communication of these insights, making it easier to implement targeted improvements.