Sales Data Analysis with Python

Super-Market Sales Report

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Overview

In this project, I analyzed sales data using **Python (pandas, matplotlib, seaborn)** to uncover trends, customer behavior, and product performance. The analysis focused on actionable insights for business growth.
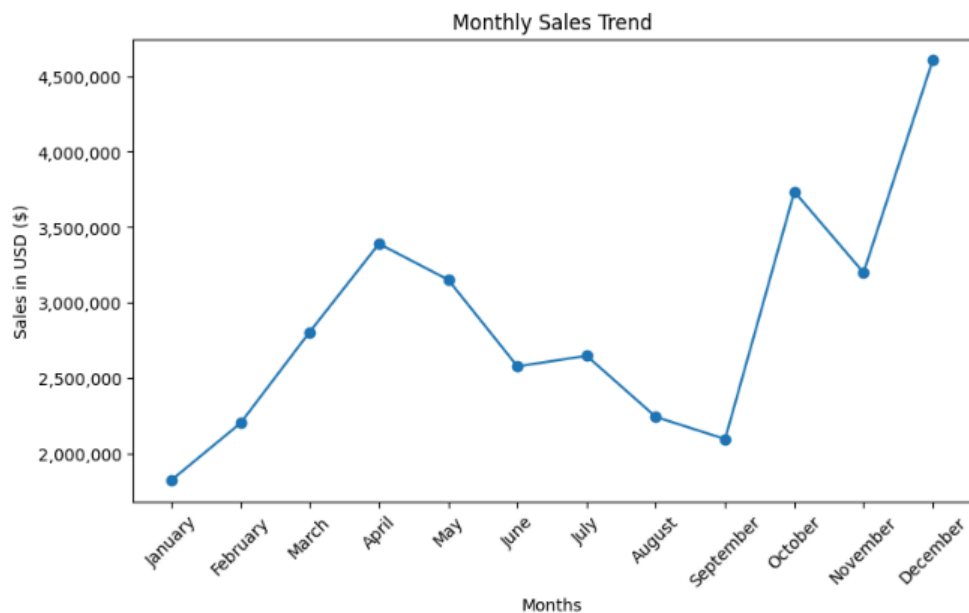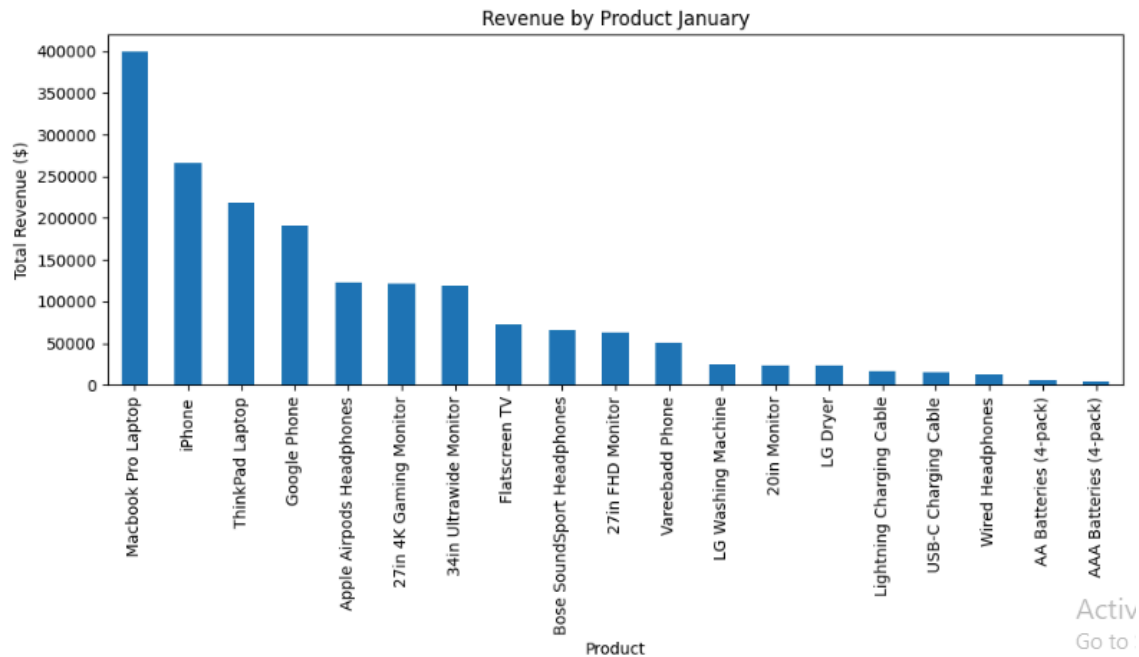
About the Dataset:

- Source: Downloaded from **Kaggle**
- Data: **Yearly supermarket sales** (12 monthly CSV files merged into a single DataFrame)
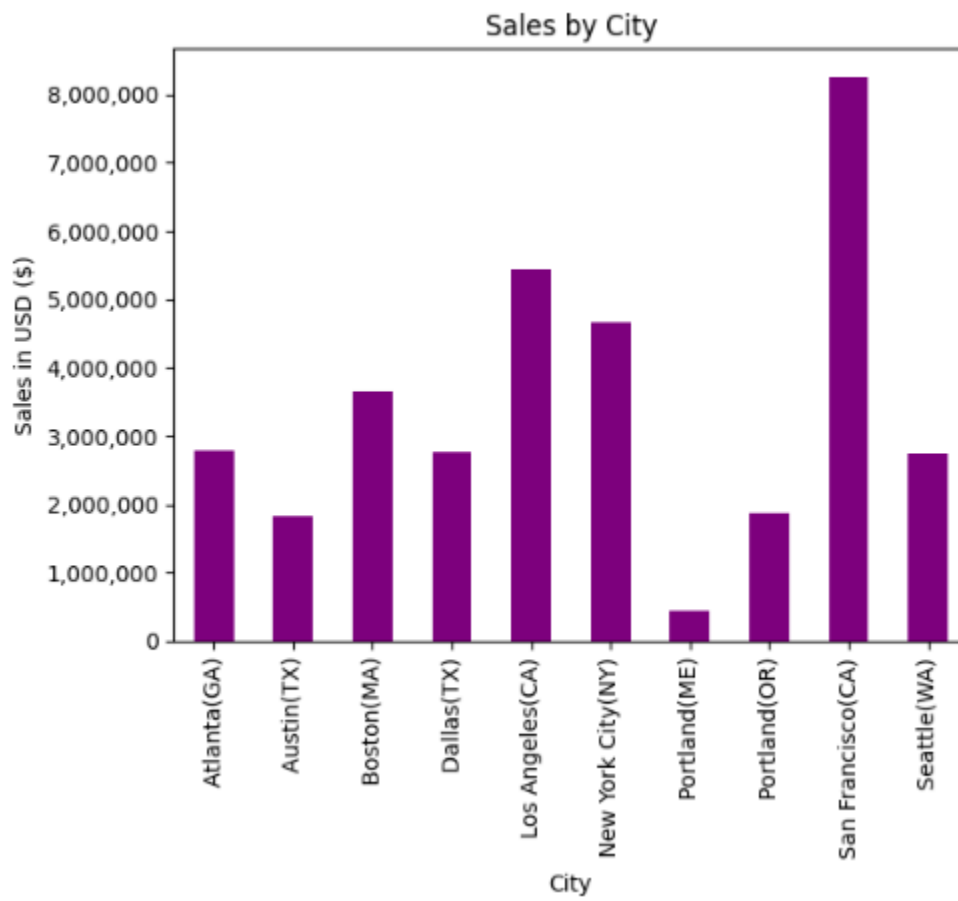- Size: 186850 rows & 6 columns

Business Questions Answered

Which was the best month for sales? How much was earned that month?

- ● *Insight:* December had the highest sales with revenue of $4608295.7

Revenue by Product January

Monthly Sales Trend

Which was the best month for sales? How much was earned that month?
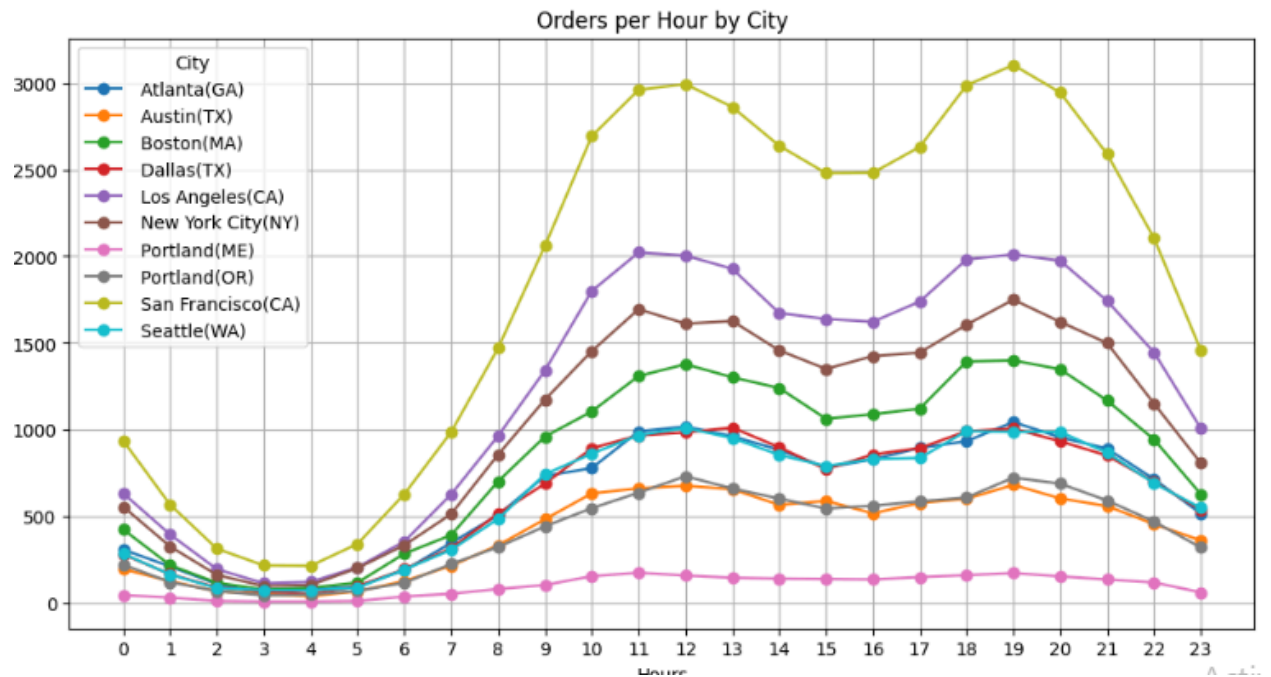
Insight: San Francisco generated the most sales.

Sales by City

San Francisco (CA) had total sales of $8254743.55.

What time should we display ads to maximize purchases?

● *Insight:* Peak sales occurred around 11AM and 7 PM ➜ best time for ads.

Orders per Hour by City

The plot suggests that the highest number of orders that come are either between 11am-12am or 6pm-7pm which makes sense, the customers are either shopping early in the morning or after work.
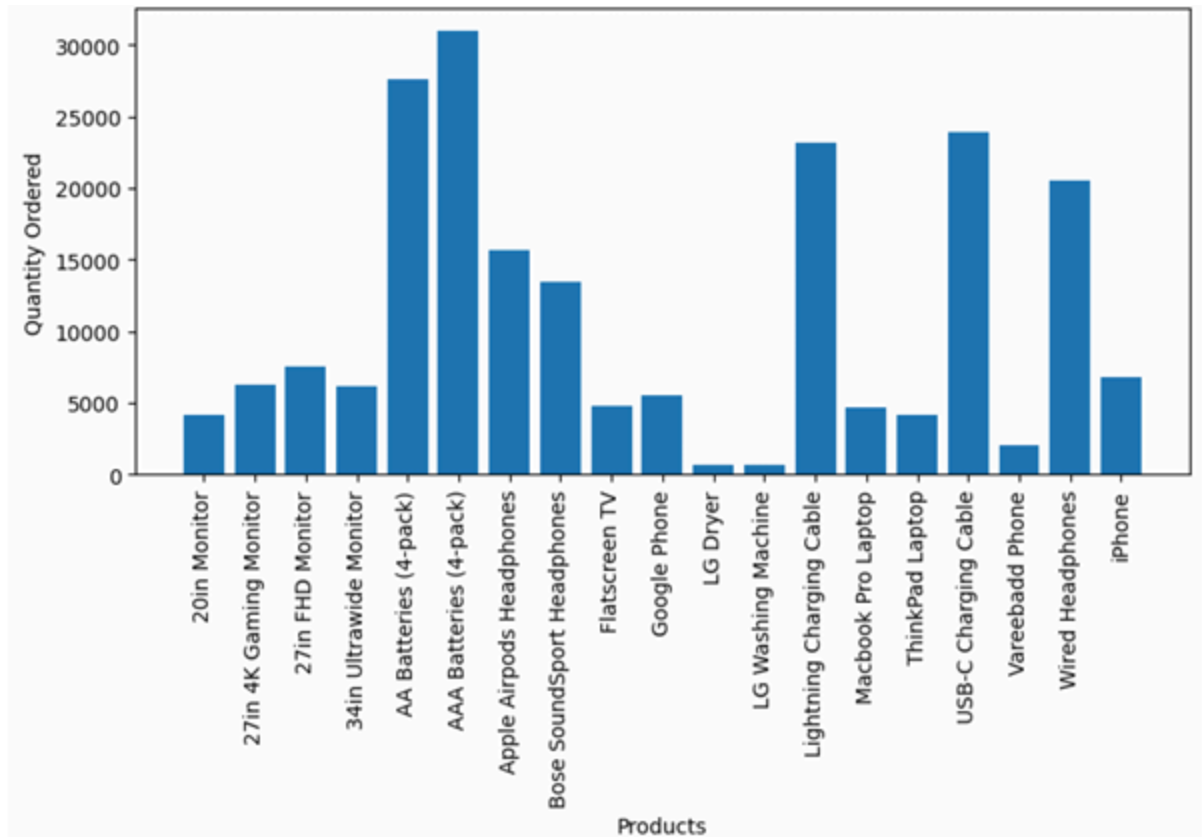
What products are often sold together?

- *Insight:* IPhone and Lightning Charging Cable were most frequently purchased together.

```
('iPhone', 'Lightning Charging Cable') 1002
('Google Phone', 'USB-C Charging Cable') 985
('iPhone', 'Wired Headphones') 447
('Google Phone', 'Wired Headphones') 413
('Vareebadd Phone', 'USB-C Charging Cable') 361
('iPhone', 'Apple Airpods Headphones') 360
('Google Phone', 'Bose SoundSport Headphones') 220
('USB-C Charging Cable', 'Wired Headphones') 159
('Vareebadd Phone', 'Wired Headphones') 143
('Lightning Charging Cable', 'Wired Headphones') 92
('Lightning Charging Cable', 'Apple Airpods Headphones') 81
('Vareebadd Phone', 'Bose SoundSport Headphones') 80
('USB-C Charging Cable', 'Bose SoundSport Headphones') 77
('Apple Airpods Headphones', 'Wired Headphones') 69
('Lightning Charging Cable', 'USB-C Charging Cable') 58
('Lightning Charging Cable', 'AA Batteries (4-pack)') 55
('Bose SoundSport Headphones', 'Wired Headphones') 53
('AA Batteries (4-pack)', 'Lightning Charging Cable') 51
('AAA Batteries (4-pack)', 'USB-C Charging Cable') 50
('Apple Airpods Headphones', 'AAA Batteries (4-pack)') 48
('AA Batteries (4-pack)', 'AAA Batteries (4-pack)') 48
('USB-C Charging Cable', 'AAA Batteries (4-pack)') 45
('Wired Headphones', 'USB-C Charging Cable') 44
('AA Batteries (4-pack)', 'Wired Headphones') 44
('AAA Batteries (4-pack)', 'Lightning Charging Cable') 44
('AAA Batteries (4-pack)', 'Wired Headphones') 43
('Wired Headphones', 'AAA Batteries (4-pack)') 43
('USB-C Charging Cable', 'Lightning Charging Cable') 42
('AA Batteries (4-pack)', 'Apple Airpods Headphones') 41
('AAA Batteries (4-pack)', 'AA Batteries (4-pack)') 39
```

What product was sold the most, and why?

- *Insight:* Product AAA batteries sold the most due to affordability and high demand.

Tools & Skills Demonstrated:

- **Python:** pandas, matplotlib, seaborn

- **Data Cleaning:** merging, duplicates removal, missing value handling

- **Visualization:** bar charts, time series plots, co-occurrence analysis

- **Business Insight:** answered real-world sales questions