SUPERMARKET SALES DATA ANALYSIS PRESENTATION

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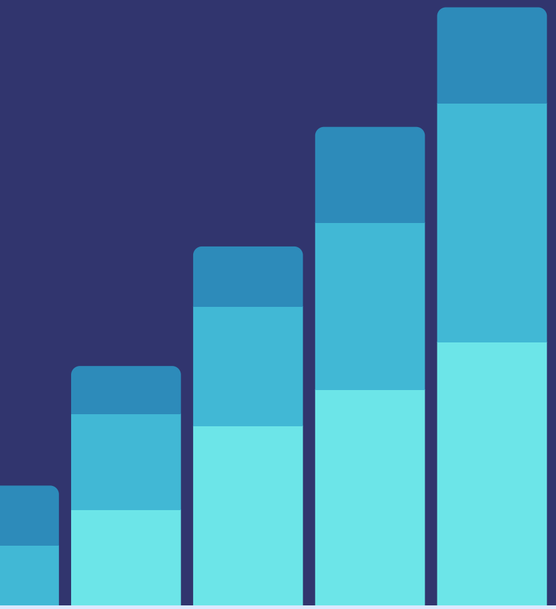
PROJECT OVERVIEW



🐍 Python، 📊 Charts، 💡 Insights

This project analyzes supermarket sales data to understand customer behavior, sales trends, and profitability.
Tools used: Python, Pandas, Matplotlib, Seaborn

DATASET INFORMATION

According to the data cleanliness formula"

$$\frac{duplicates^{N}missing^{+N}}{total^{N}} - 1 = C$$

".the dataset achieved a score of **1.0 (100%)**, indicating that it is fully clean and ready for analysis

DATASET: 1000 SALES RECORDS

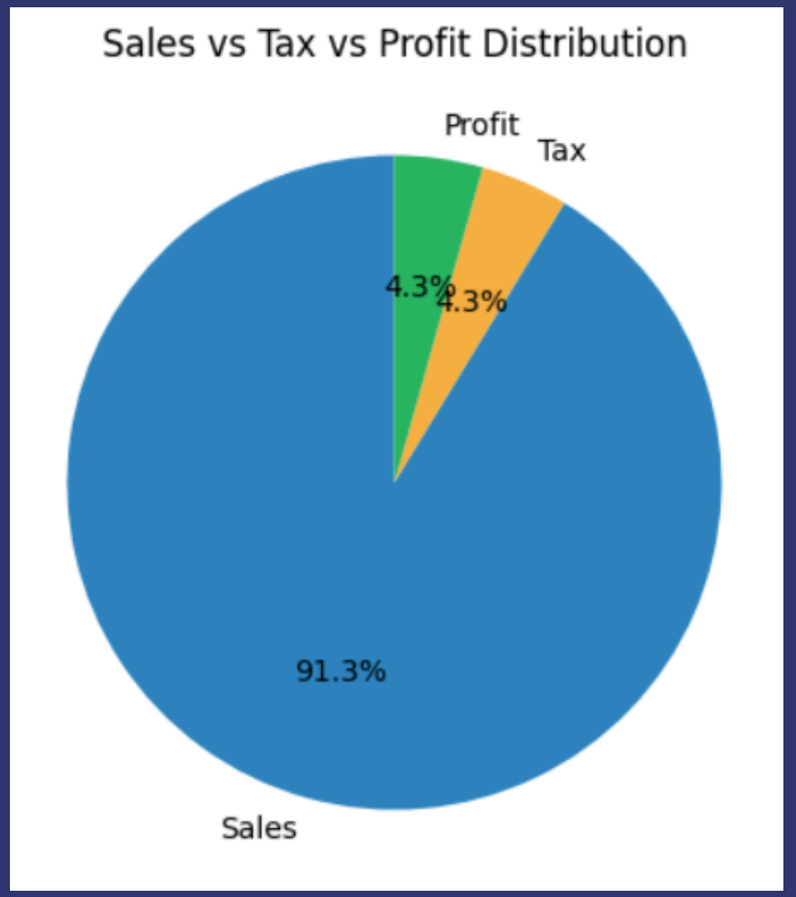
NO MISSING VALUES

COLUMNS: 12 (CITY, BRANCH, PRODUCT LINE, TOTAL, RATING, ETC.)

CLEAN AND READY FOR ANALYSIS

Sales, Profit & Tax Analysis

THIS ANALYSIS PRESENTS THE STORE'S KEY FINANCIAL METRICS.
TOTAL SALES REACHED €322,000,
WITH €15,380 PROFIT AND A 4.7% PROFIT MARGIN.
THE 5% TAX RATE REMAINS CONSISTENT ACROSS ALL TRANSACTIONS,
INDICATING A STABLE AND PROPORTIONAL FINANCIAL STRUCTURE.
SALES ARE BALANCED ACROSS BRANCHES WITH SLIGHT DOMINANCE OF NAYPYITAW.



$$(_i\text{Quantity} \times {}_i\text{Unit Price}) \sum_{i=1}^{n} = \text{Total Sales}$$

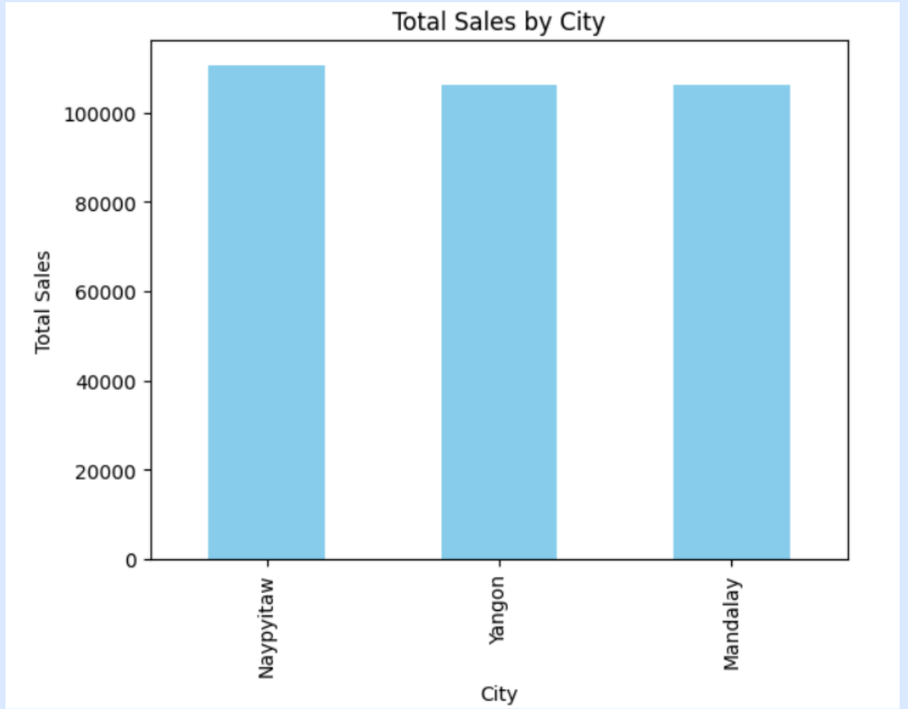
$$\text{Tax Rate} \times \text{Total Sales} = \text{Total Tax}$$

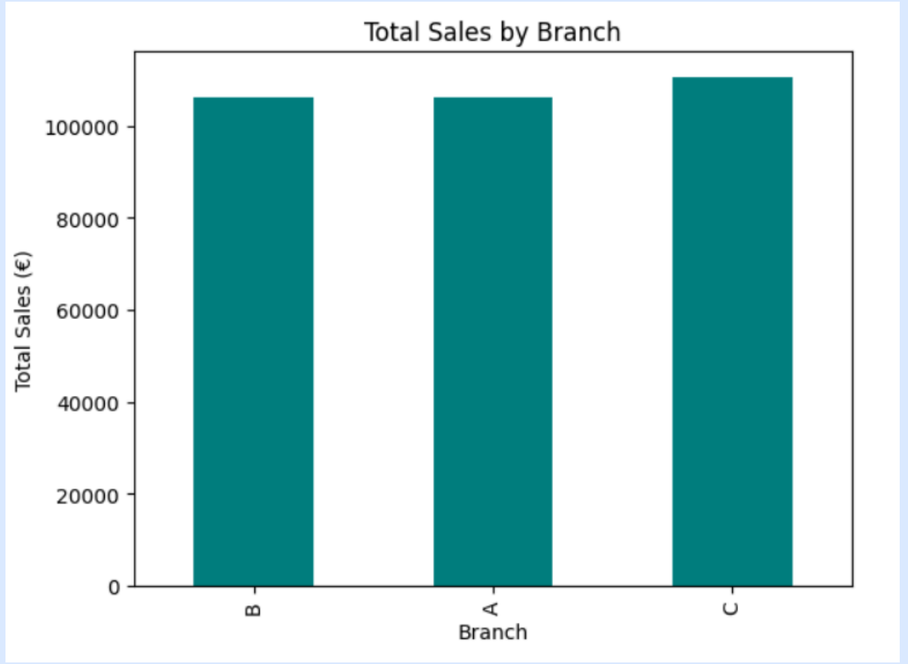
$$100\% \times \frac{\text{Gross Income}}{\text{Total Sales}} = \text{Profit Margin}$$

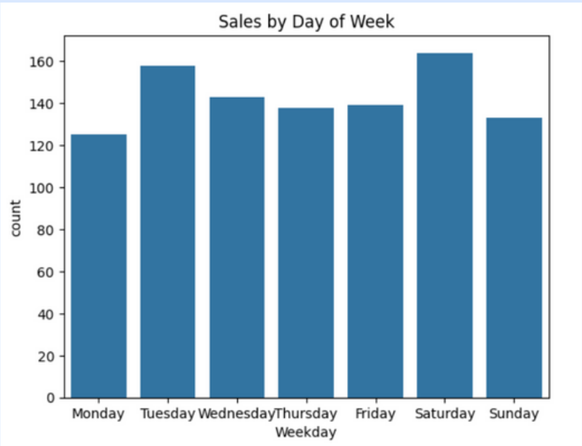
$$100\% \times \frac{\text{Total Tax}}{\text{Total Sales}} = \text{Tax Rate}$$

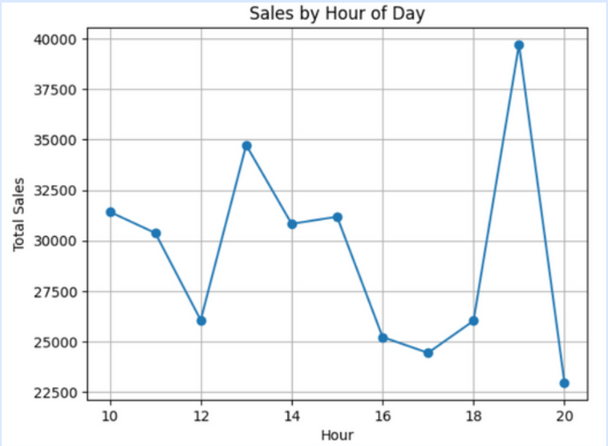
TOTAL SALES BY CITY AND BRANCH

Naypyitaw achieved the highest sales (~110K), followed by Yangon and Mandalay. Sales are balanced across branches with slight dominance of Naypyitaw.

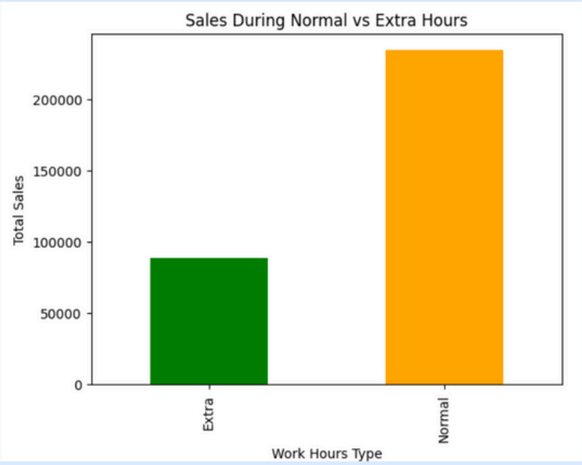


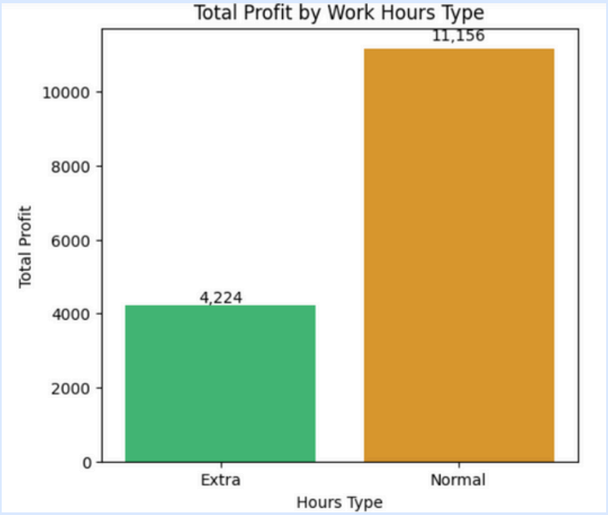






$$\text{if } (t < 8 \text{ or } t > 17) \quad \text{,"Extra"} \\ \text{otherwise} \quad \text{,"Normal"} \Big\} = \text{Extra\_hours}(t)$$





SALES BY DAY AND HOUR

Sales peak on Fridays and Saturdays, especially during evening hours (Extra Hours).
Suggestion: Extend working hours to cover peak demand.

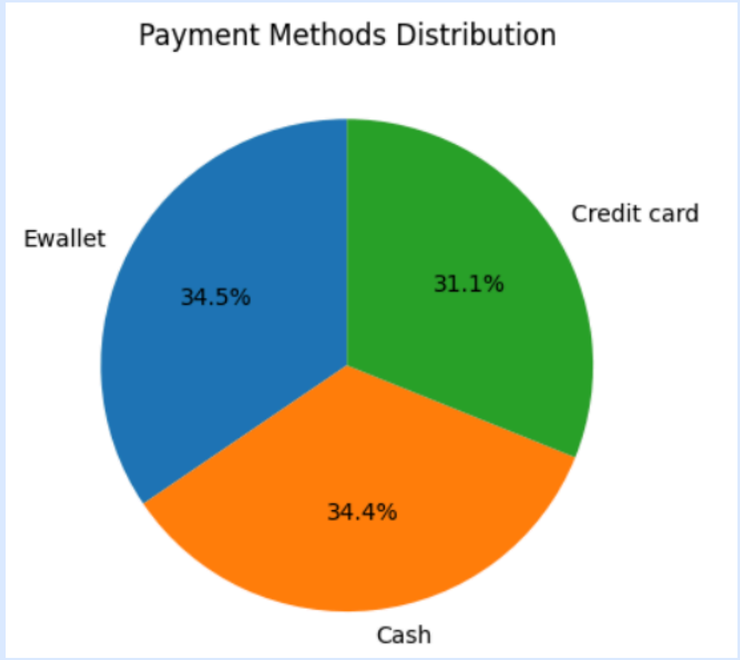
A new column Extra_hours was added to classify each transaction time into:

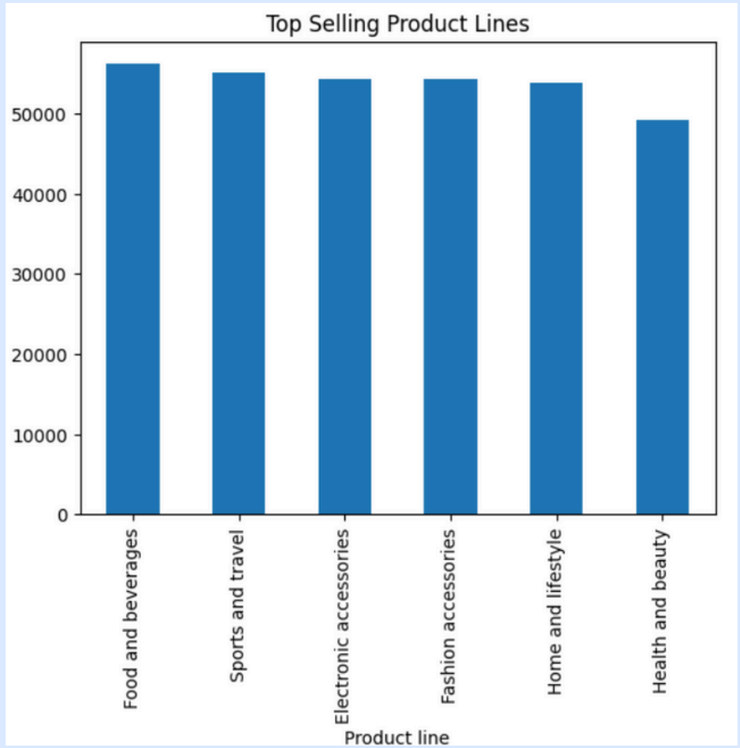
- Normal hours (8 AM – 5 PM)
- Extra hours (before or after working time)

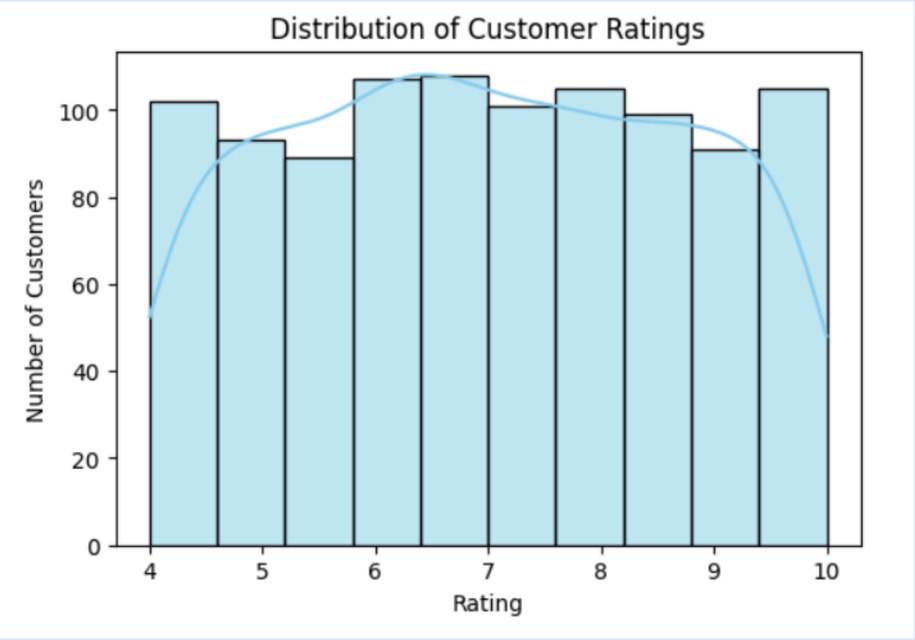
The analysis revealed that sales during Extra hours were slightly higher,
highlighting the potential benefit of extending store hours to capture evening demand.

PRODUCT & PAYMENT ANALYSIS

Ewallet is the most popular payment method.
Food & Beverages and Health & Beauty have the highest sales and profits.





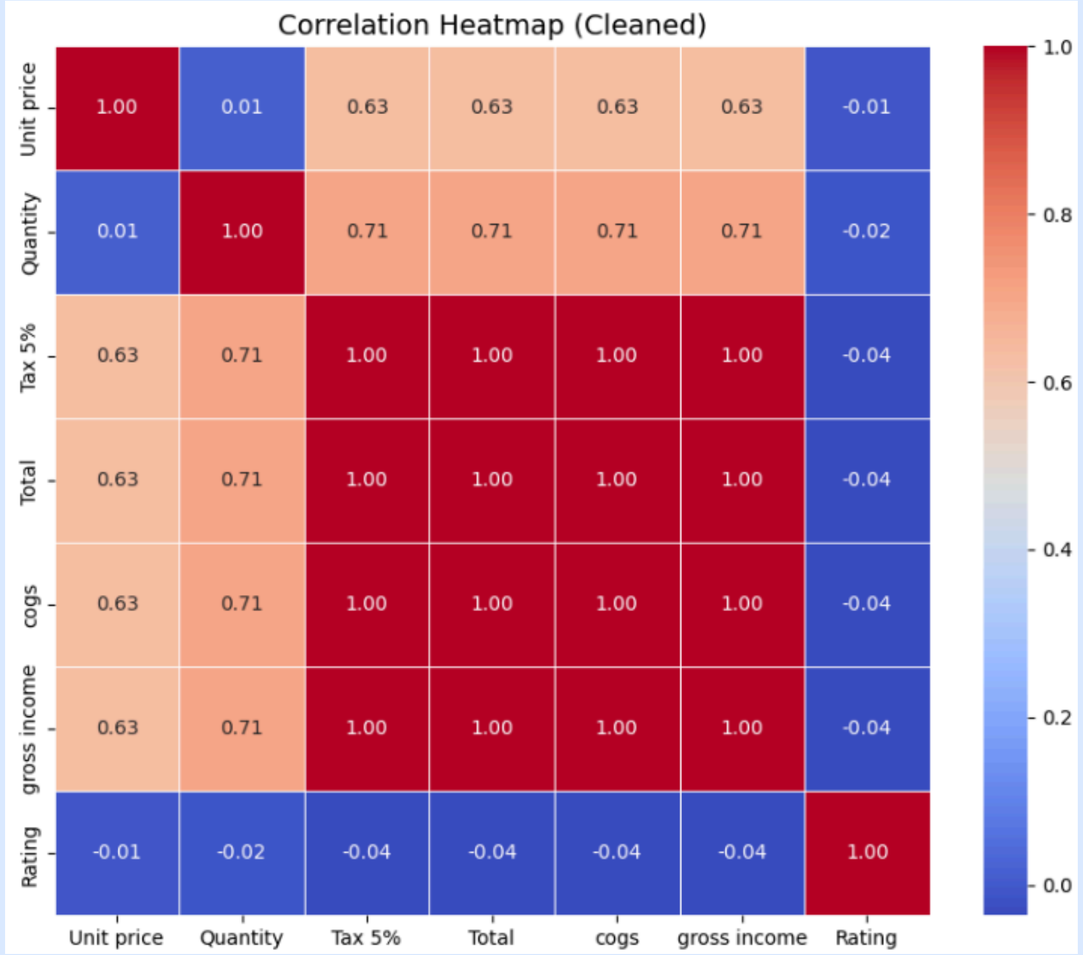


CUSTOMER BEHAVIOR

Members spend more than normal customers.
Average ratings are between 7–9, showing overall satisfaction.
Ratings are not affected by total sales value — service quality matters most.
Gender:
Sales levels are nearly equal between males and females,
with slightly higher spending among female customers.
Sales vs Rating:
Very weak correlation — customer satisfaction is driven by service quality, not purchase amount.

CORRELATION HEATMAP

Strong positive relationship between Total, Tax, and Profit.
Ratings show weak correlation with sales — customer satisfaction is independent from price.



المعادلة الرياضية لمعامل الارتباط (Pearson Correlation Coefficient)

$$\frac{(y - {}_{i}y)(x - {}_{i}x)^{n}_{i=1}\sum}{\sqrt{{}^{2}(y - {}_{i}y)^{n}_{i=1}\sum}\ \sqrt{{}^{2}(x - {}_{i}x)^{n}_{i=1}\sum}} = r$$

CONCLUSION & RECOMMENDATIONS

Conclusion

- The supermarket shows stable and healthy financial performance with a 4.7 % profit margin.
- Evening hours and weekends generate higher sales volumes.
- Weak correlation between sales and ratings → satisfaction depends on service quality, not price.
- Food & Beverages and Health & Beauty remain the most profitable categories.

Recommendations

- Extend operating hours during peak periods (evenings & weekends).
- Improve customer experience to enhance satisfaction and ratings.
- Focus marketing efforts on high-profit product lines.
- Promote digital payment methods and strengthen loyalty programs.

THANK YOU FOR YOUR ATTENTION!

I'LL BE HAPPY TO ANSWER ANY QUESTIONS OR DISCUSS FURTHER INSIGHTS.