



Analyzing the Correlation between Supershop Sales and Weather Patterns in Myanmar: A Data-Driven Investigation



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Introduction

Supermarkets in the retail industry are significantly affected by external factors like weather conditions. This project investigates the correlation between temperature and Supershop sales in Yangon, Mandalay, and Naypyitaw, aiming to transform conventional strategies in inventory management, pricing, and marketing. Unveiling the interplay enables businesses to use predictive analytics effectively for demand fluctuations.

Project Goals

Within the project scope, I'm curious about the following questions :

- 1. How does the temperature vary in Yangon, Mandalay and Naypyitaw cities during Jan to March in 2019?**
- 2. How does the supermarket sales in those cities vary during the exact time frame?**
- 3. Does temperature affect supermarket sales?**

Dataset



Weather Data

- Metadata URL:
<https://dev.meteostat.net/bulk/daily.html>
- Data URL:
https://bulk.meteostat.net/v2/daily/station_id.csv.gz%20;%20station_id%20=%2048097,%2048042,%20VYNT0
- Data Type: CSV



Supershop Sale Data

- Metadata URL:
<https://www.kaggle.com/datasets/aungpyaeap/supermarket-sales/data>
- Data URL:
<https://www.kaggle.com/datasets/aungpyaeap/supermarket-sales/download?datasetVersionNumber=3>
- Data Type: CSV

Methodology

The following process is a step-by-step process :

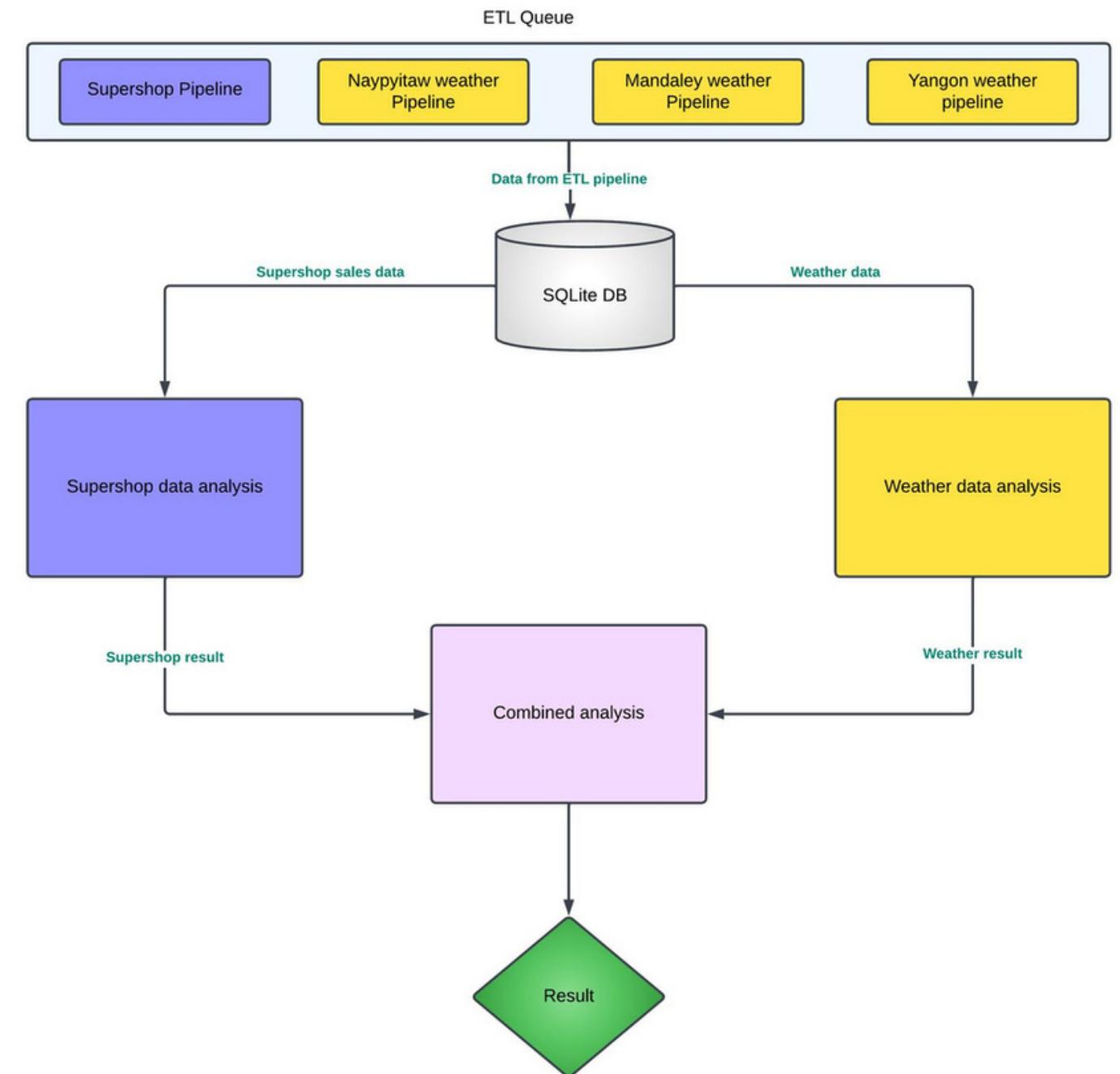
Step 1: Run the ETL Pipelines and load the data into a SQLite database.

Step 2: Analyse the Naypyitaw, Mandaley, and Yagon city's weather and find how the temperature vary during Jan to March, 2019.

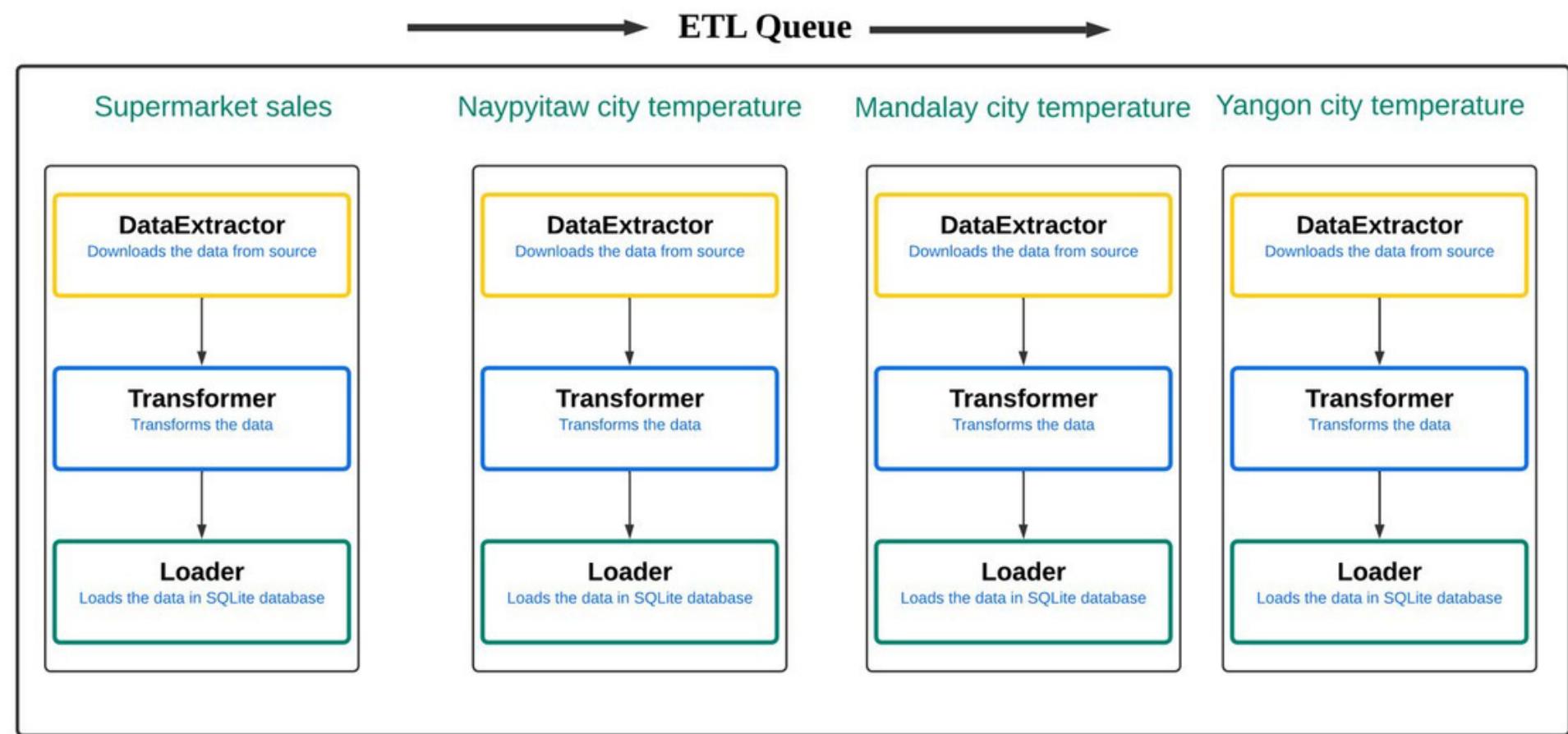
Step 3: Analyse the Naypyitaw, Mandaley, and Yagon city's supershops sales and find out how the sales vary in those cities during the exact time frame.

Step 4: Run a Combined Analysis on Supershop sales and weather to find if there are any relationship between sales and temperature.

Step 5: Get the output.



ETL-Pipeline



Results

1. TEMPERATURE VARIATION (JAN-MAR 2019)

Yangon City:

- Evident fluctuations.
- Lowest in January (22.70°C), gradually increasing to the highest in March (30.10°C).

Mandalay City

- Cooler than Yangon.
- Notable fluctuations, lowest in January (19.80°C) to peak in March to (34.00°C).

Naypyitaw City:

- Regrettably, no accessible temperature data during this period.

Results

Figure 3: Temperature variation in Yangon and Mandalay city during Jan to March 2019

Figure 3.1: Temperature variation in Yangon city

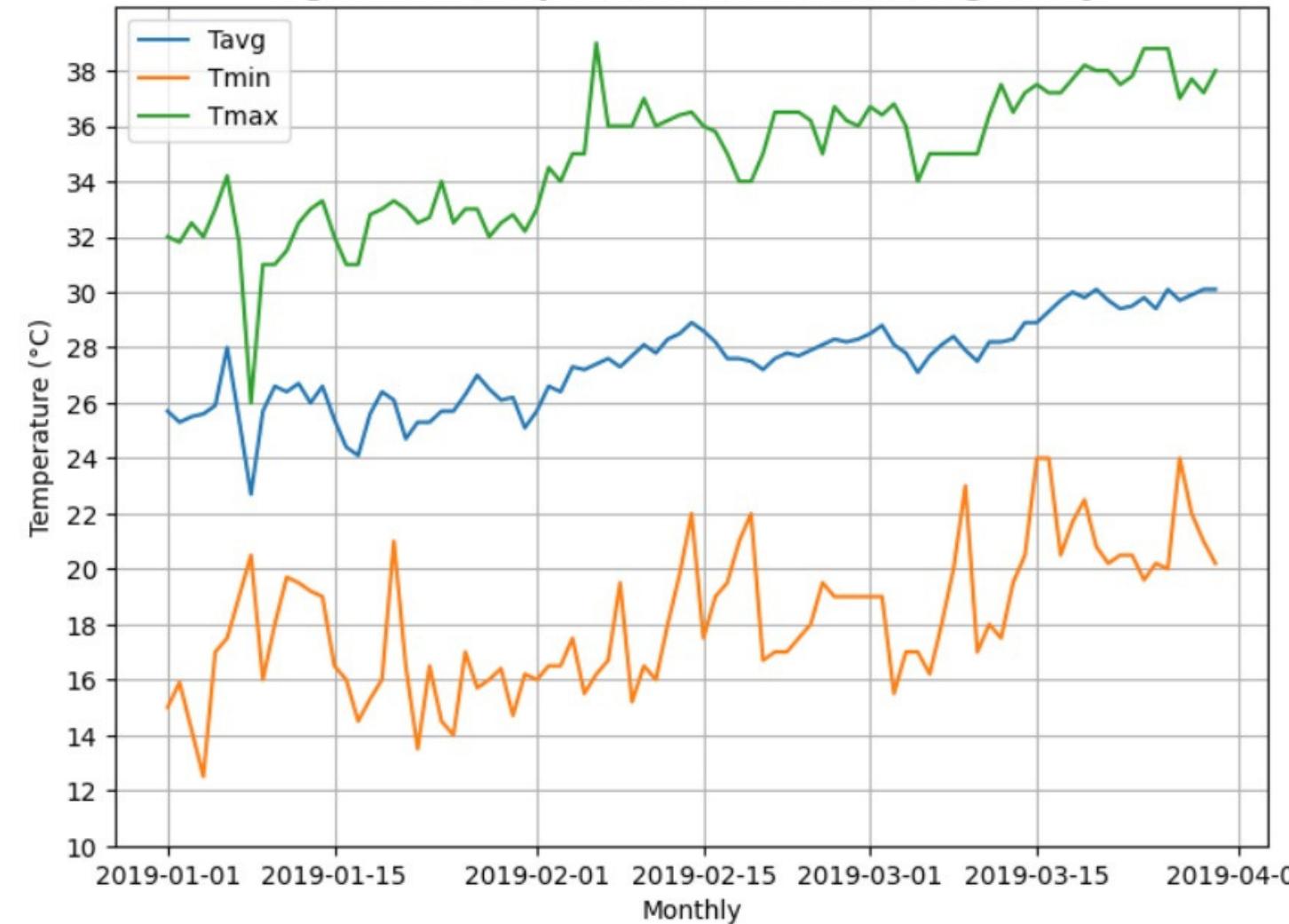
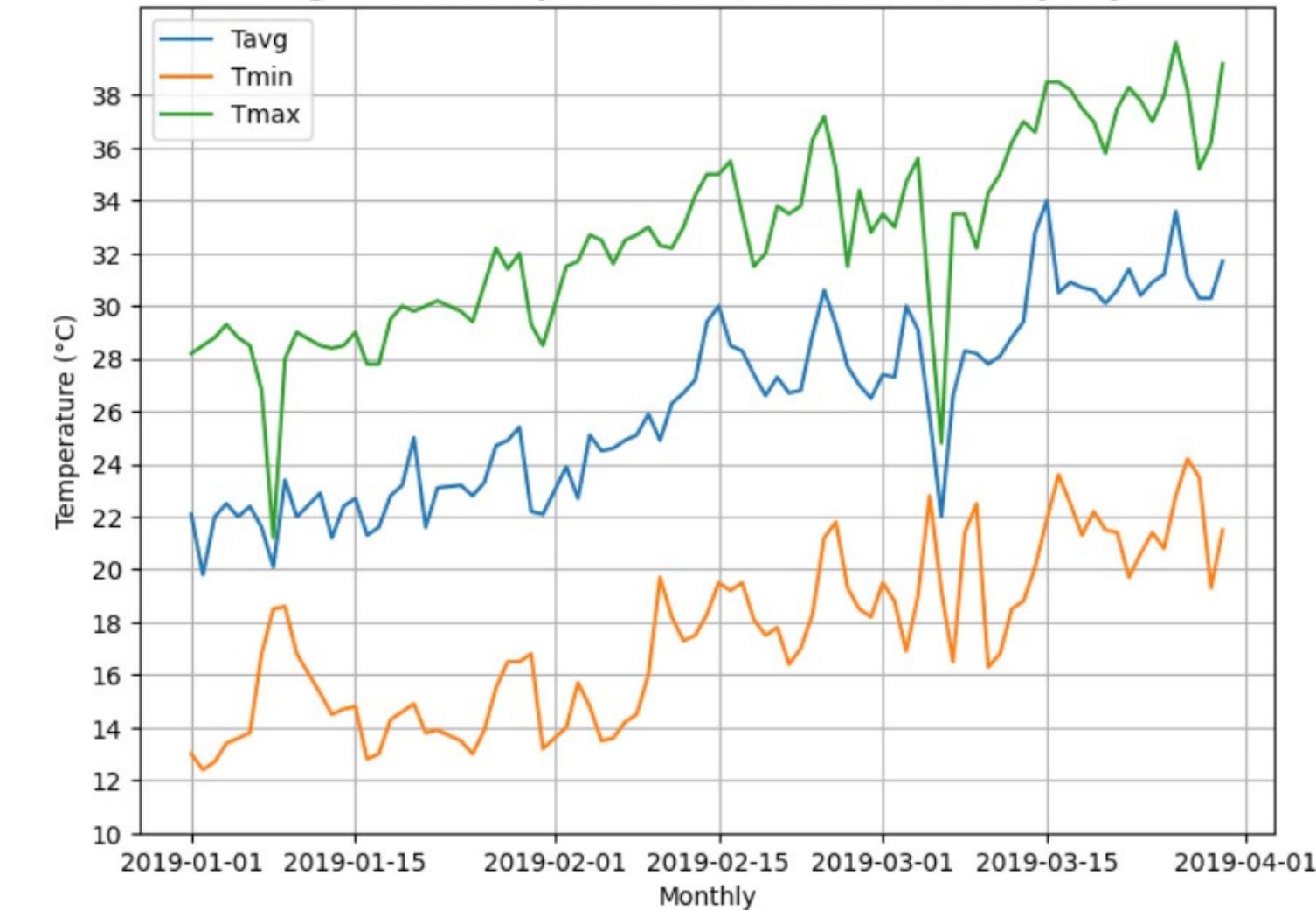


Figure 3.2: Temperature variation in Mandalay city



Results

2. SUPERMARKET SALES VARIATION (JAN-MAR 2019)

Trends:

- Peak mean sales in January, followed by a decrease in February and March for Yangon.
- Mirrored in Mandalay.
- Naypyitaw displays a unique trend with the highest mean sales in March.

City Comparisons:

- Naypyitaw has the highest average sales in March (350.93 dollars per day).
- Yangon and Mandalay record the lowest mean sales in March (296.53 dollars and 308.90 dollars per day).

Results

Figure 4: Supershop Sales variation in Yangon, Mandalay and Naypyitaw cities during Jan to March 2019

Fig 4.1: Supershop sales variation in Yangon city

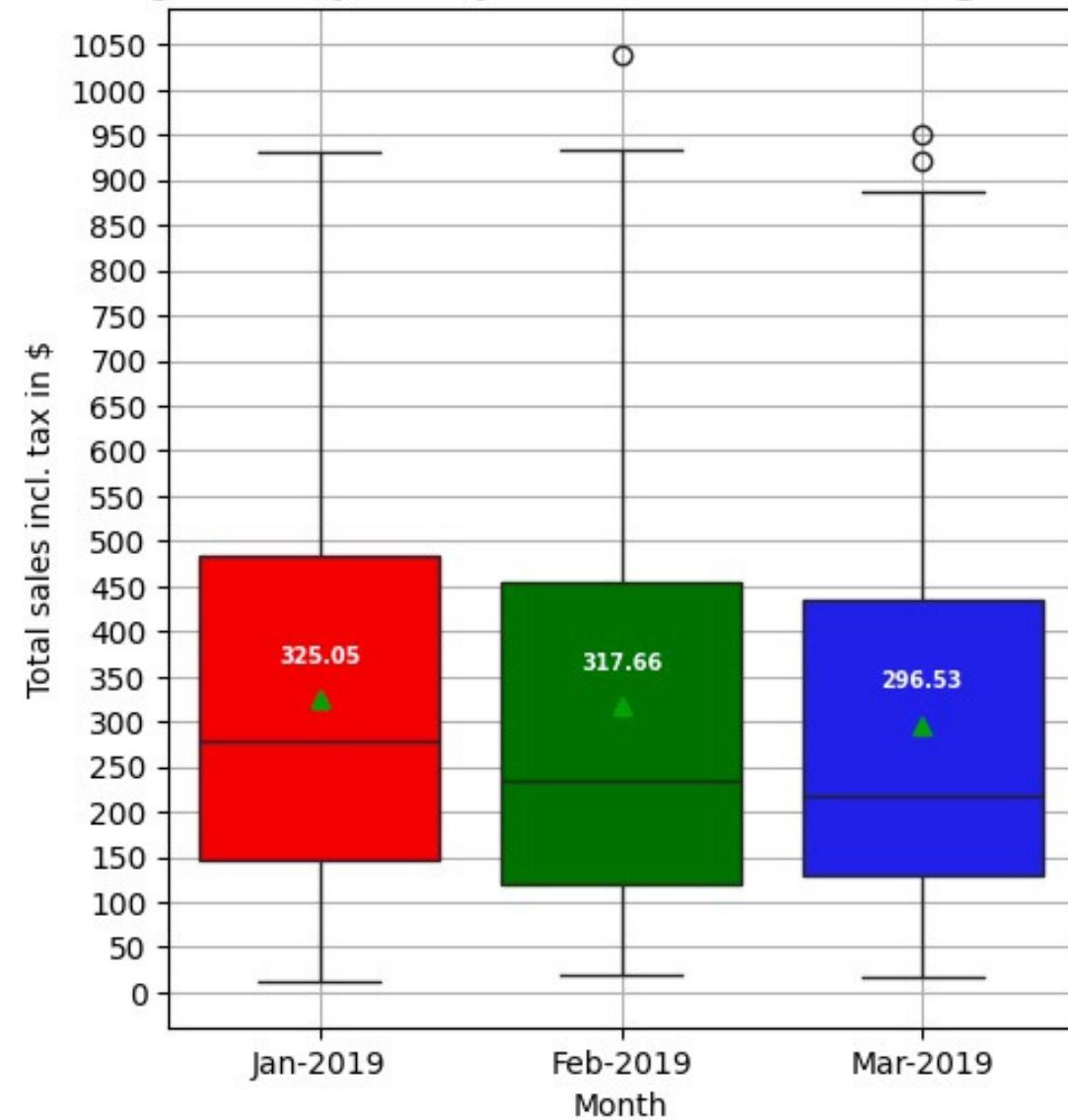


Fig 4.2: Supershop sales variation in Mandalay city

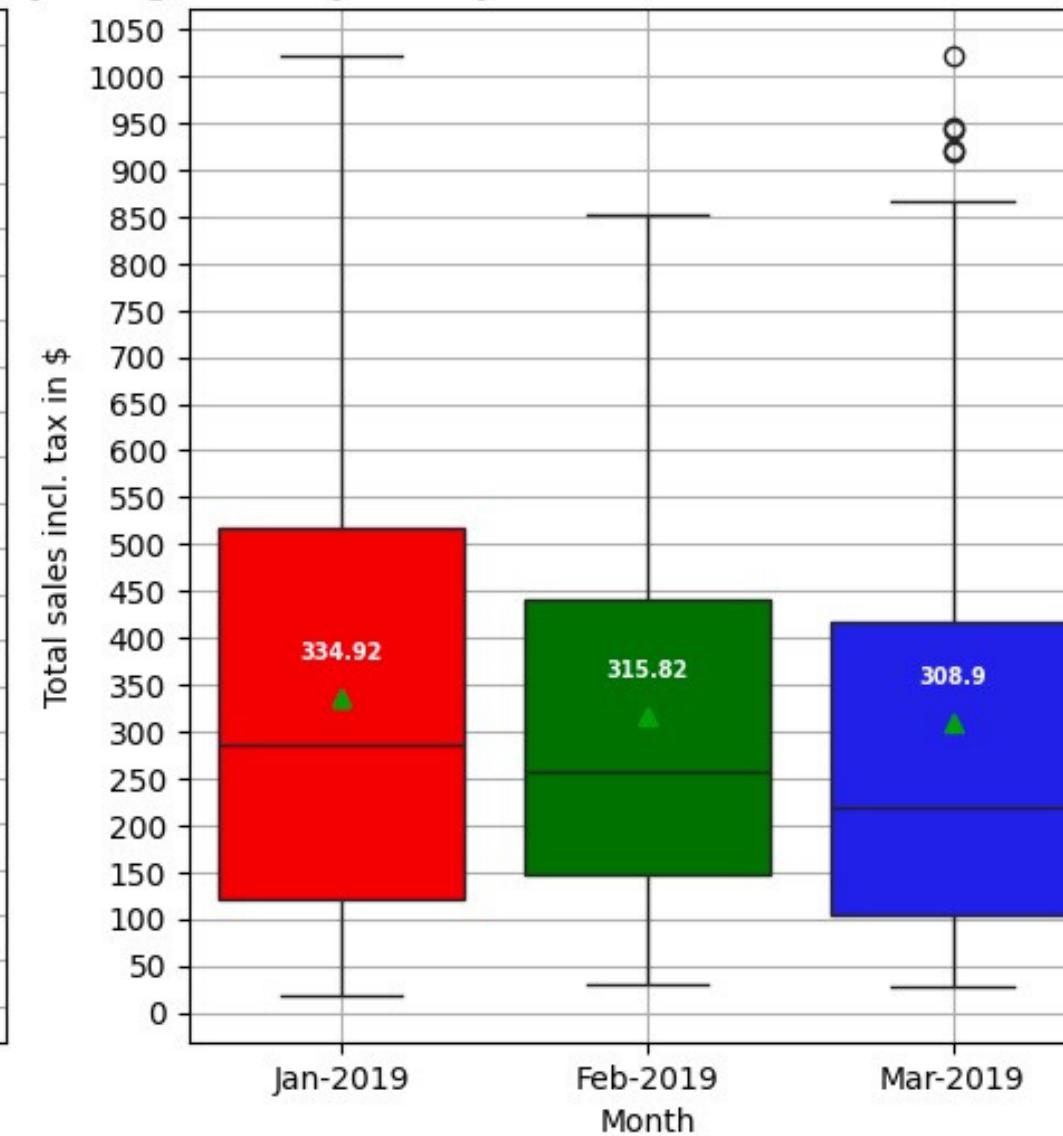
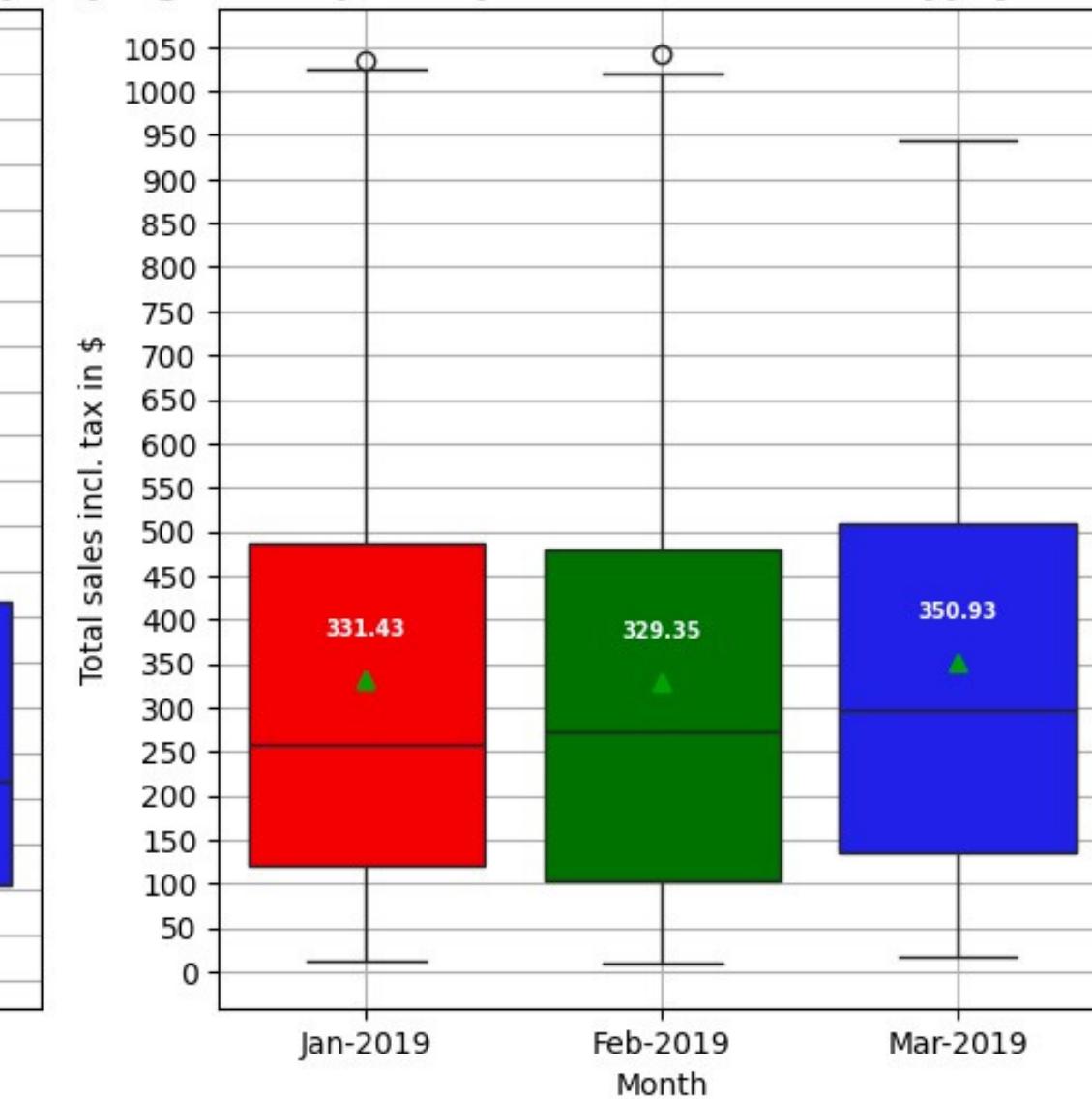


Fig 4.2: Supershop sales variation in Naypyitaw city



Results

DOES TEMPERATURE AFFECT SUPERMARKET SALES?

Yangon City:

- Exiguous correlation.
- Higher temperatures are linked to relatively lower sales.

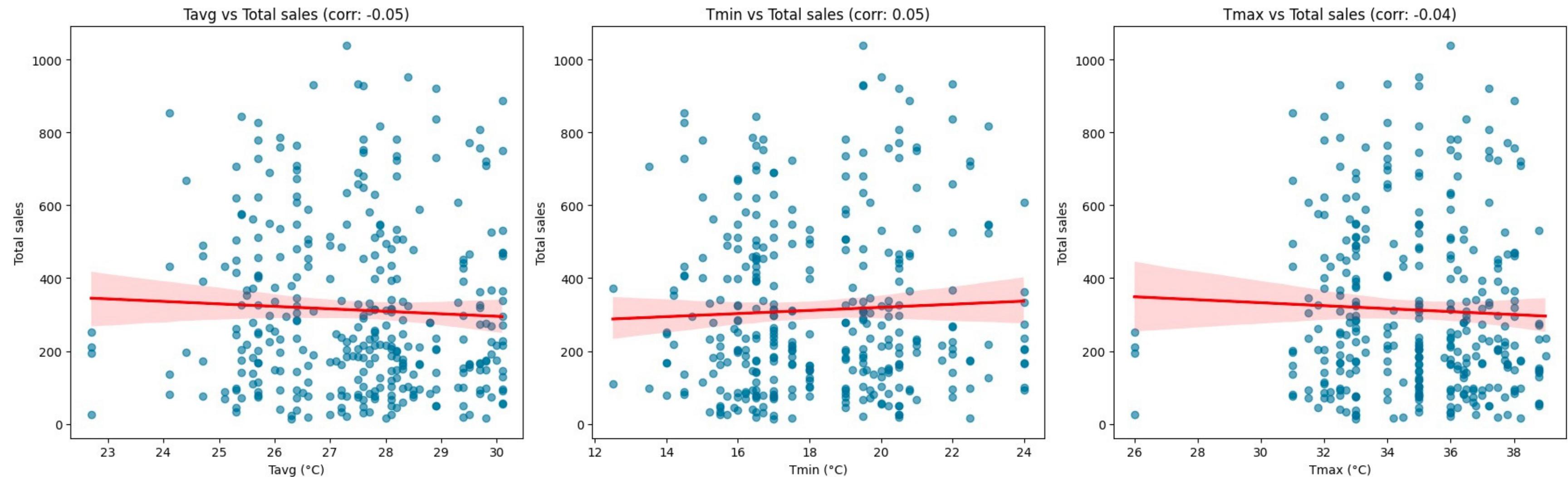
Mandalay City

- Slight correlation.
- High temperatures are associated with relatively lower sales.



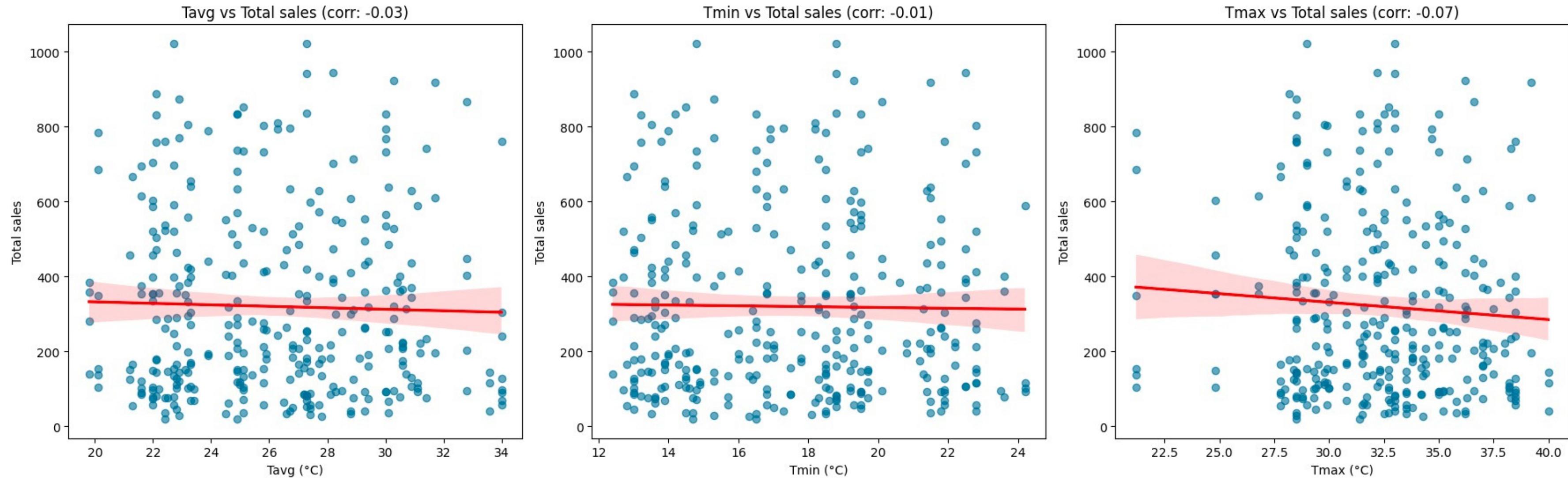
Results

Figure 5: Relationship between Temperature and Supershop Sales in Yangon



Results

Figure 6: Relationship between Temperature and Supershop Sales in Mandalay



Conclusion

The analysis unveils temperature fluctuations, varying sales patterns, and correlations between Yangon and Mandalay. We can say that temperature does affect supermarket sales in Yangon and Mandalay but not significantly. Unfortunately, this relationship could not be explored for Naypyitaw City due to the absence of temperature data during this specific time frame



Challenges and Future work

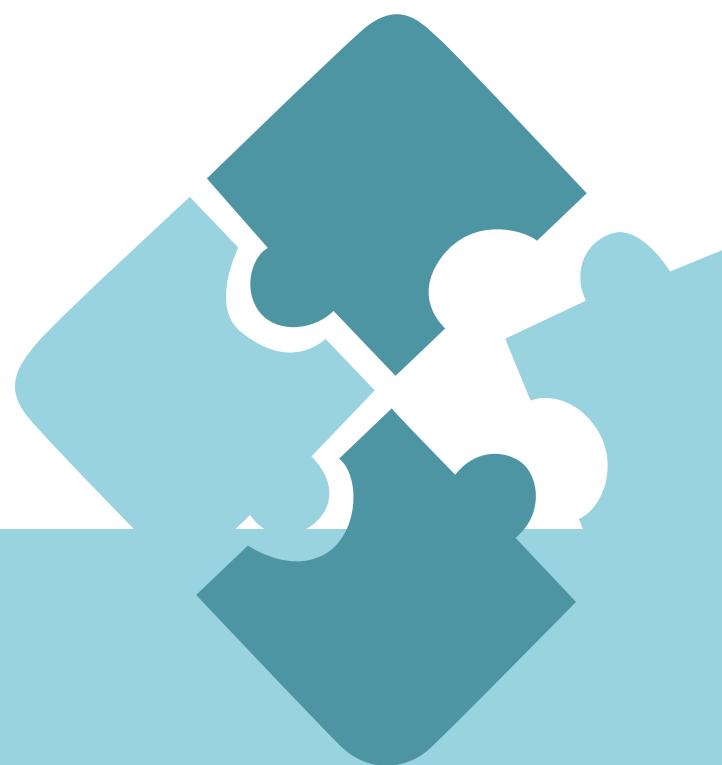
Despite meticulous data engineering processes, limitations exist and create the scope of future work.

Absence of Temperature Data for Naypyitaw:

- The unavailability of temperature data for Naypyitaw hinders exploring its correlation with sales.

Potential for Future Exploration:

- Acquiring Naypyitaw's temperature data would enhance future analyses and allows for a more in-depth examination of its correlation with sales.





Thank
you!

