

THE DATA MASTER PROJECT DAY RETAIL ANALYSIS

19 MARCH 2023

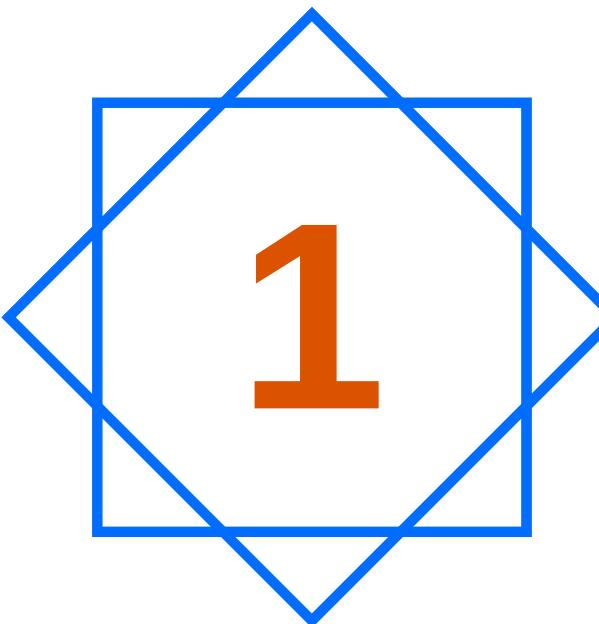
127 METEE SRISAWATVICHAI

AGENDA

1. Business goal
2. Data understanding & Analysis
3. Model fitting and Evaluate
4. Result and Recommendation



BUSINESS GOAL



1. How to increase gross income ?
2. Can improve Customer Rating ?
3. Can forecast daily gross income ?



DATA UNDERSTANDING & ANALYSIS



1. Attribute and missing value
2. Day and time to promotion.
3. Product line quantity with Day of week.
4. Payment and Customer rating.

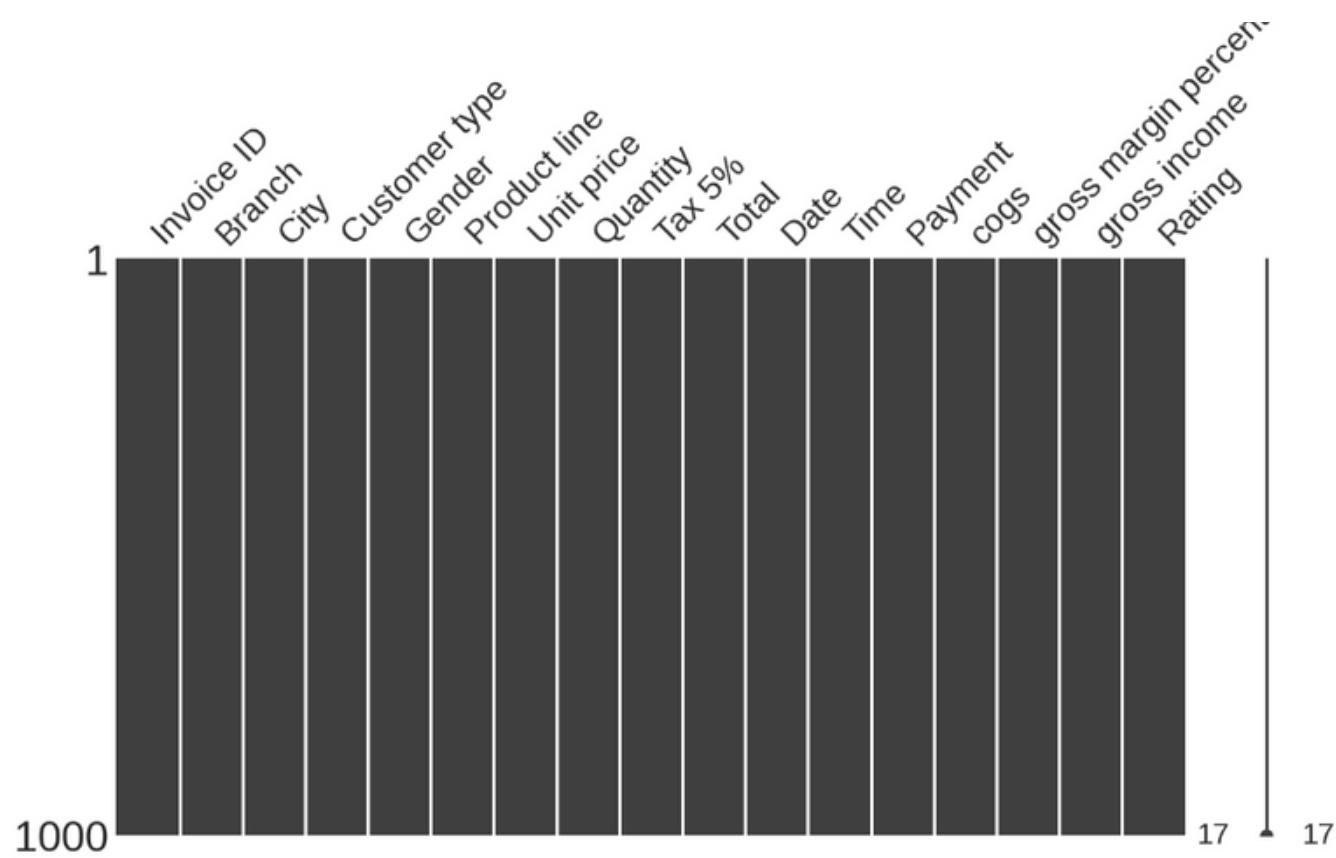


DATA UNDERSTANDING

- **17 Attributes**

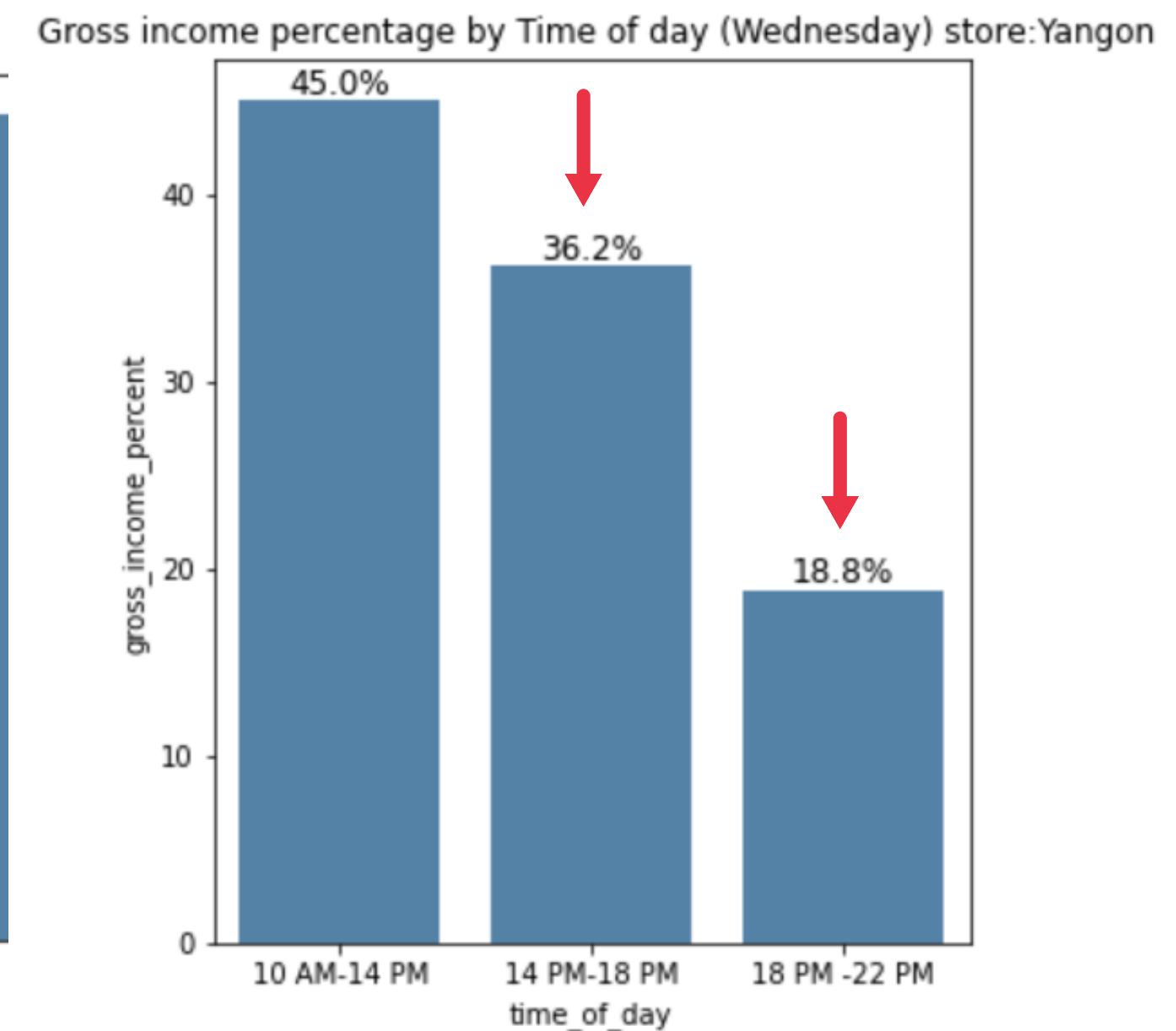
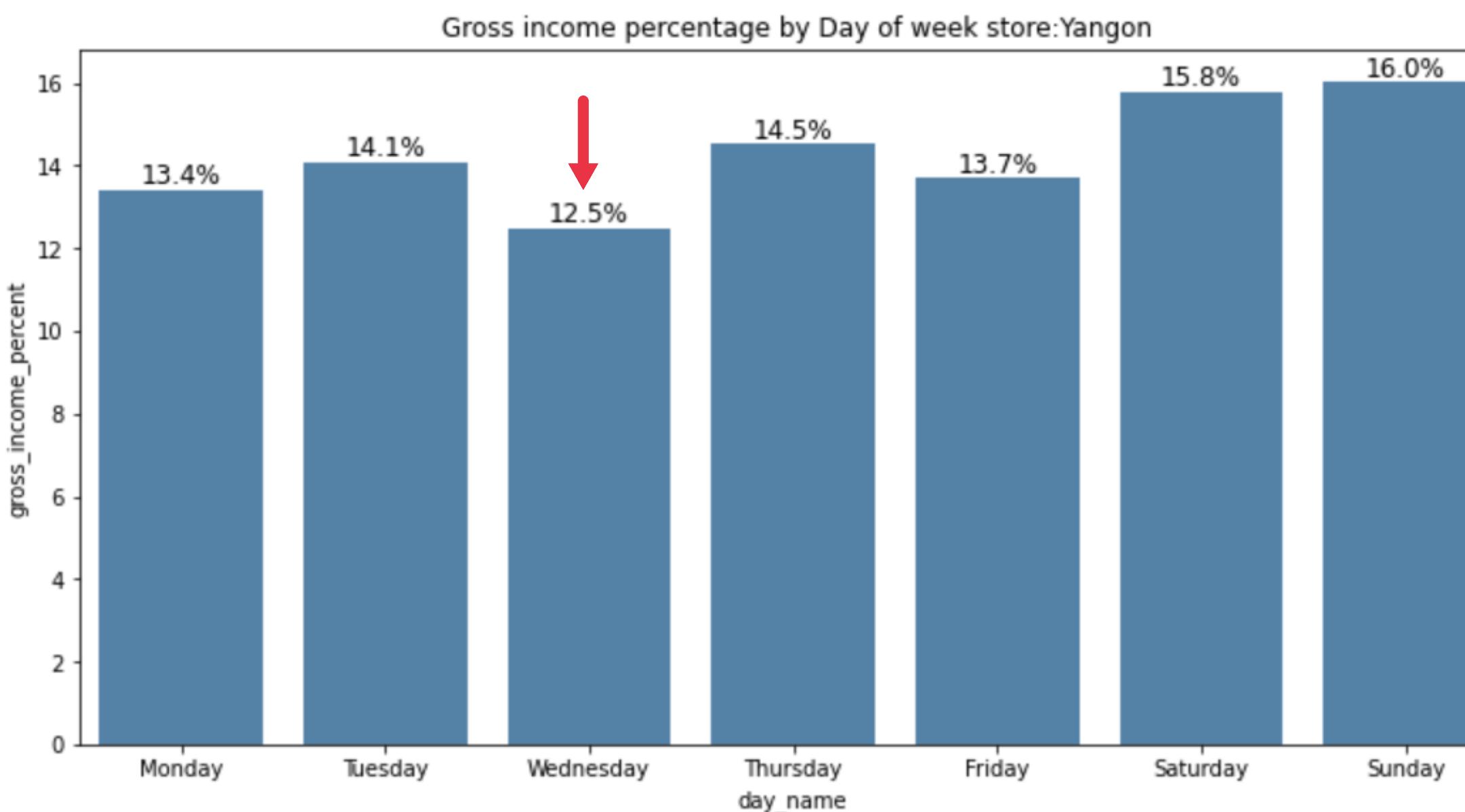
- Invoice id: Computer generated sales slip invoice identification number
- Branch: Branch of supercenter (3 branches are available identified by A, B and C).
- **City:** Location of supercenters
- Customer type: Type of customers, recorded by Members for customers using member card and Normal for without member card.
- Gender: Gender type of customer
- **Product line:** General item categorization groups - Electronic accessories, Fashion accessories, Food and beverages, Health and beauty, Home and lifestyle, Sports and travel
- Unit price: Price of each product in \$
- **Quantity:** Number of products purchased by customer
- Tax: 5% tax fee for customer buying
- Total: Total price including tax
- **Date:** Date of purchase (Record available from January 2019 to March 2019)
- **Time:** Purchase time (10am to 9pm)
- **Payment:** Payment used by customer for purchase (3 methods are available – Cash, Credit card and Ewallet)
- COGS: Cost of goods sold
- Gross margin percentage: Gross margin percentage
- **Gross income:** Gross income
- **Rating:** Customer stratification rating on their overall shopping experience (On a scale of 1 to 10)

- Not found missing value
- Not found duplicate records



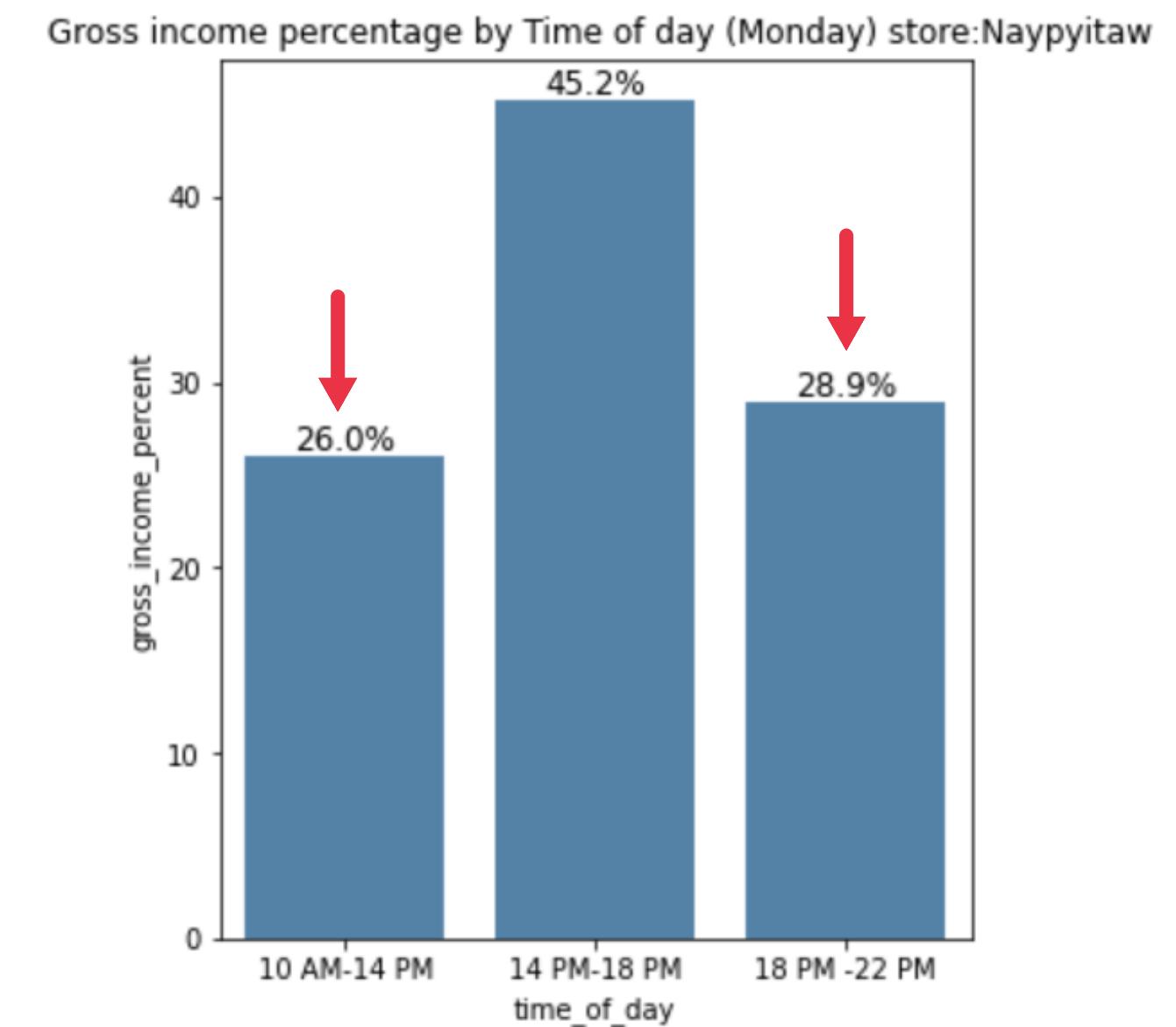
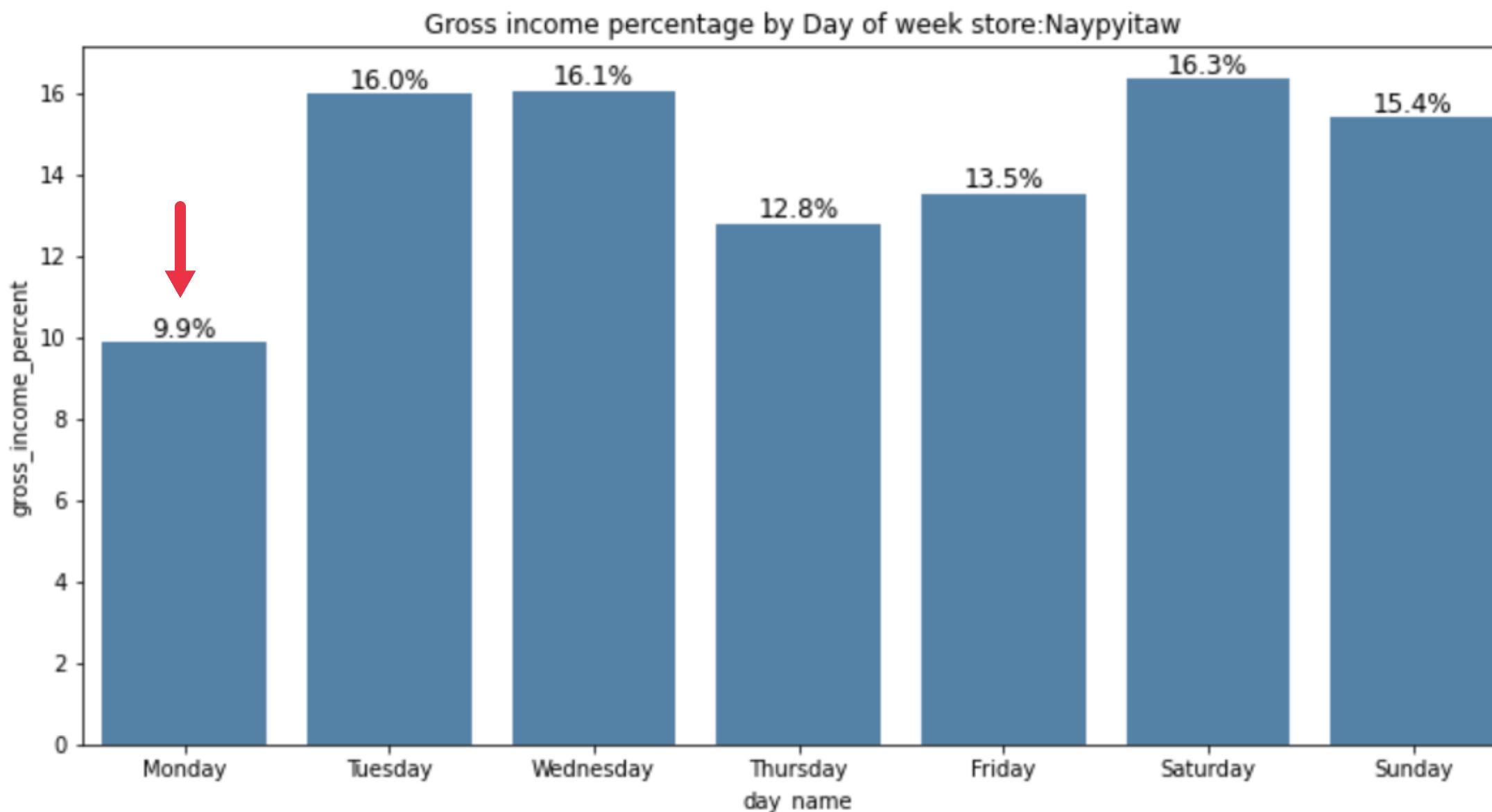
[HTTPS://WWW.KAGGLE.COM/DATASETS/AUNGPYAEAP/SUPERMARKET-SALES](https://www.kaggle.com/datasets/aungpyaeap/supermarket-sales)

DAY AND TIME TO PROMOTION (YANGON)



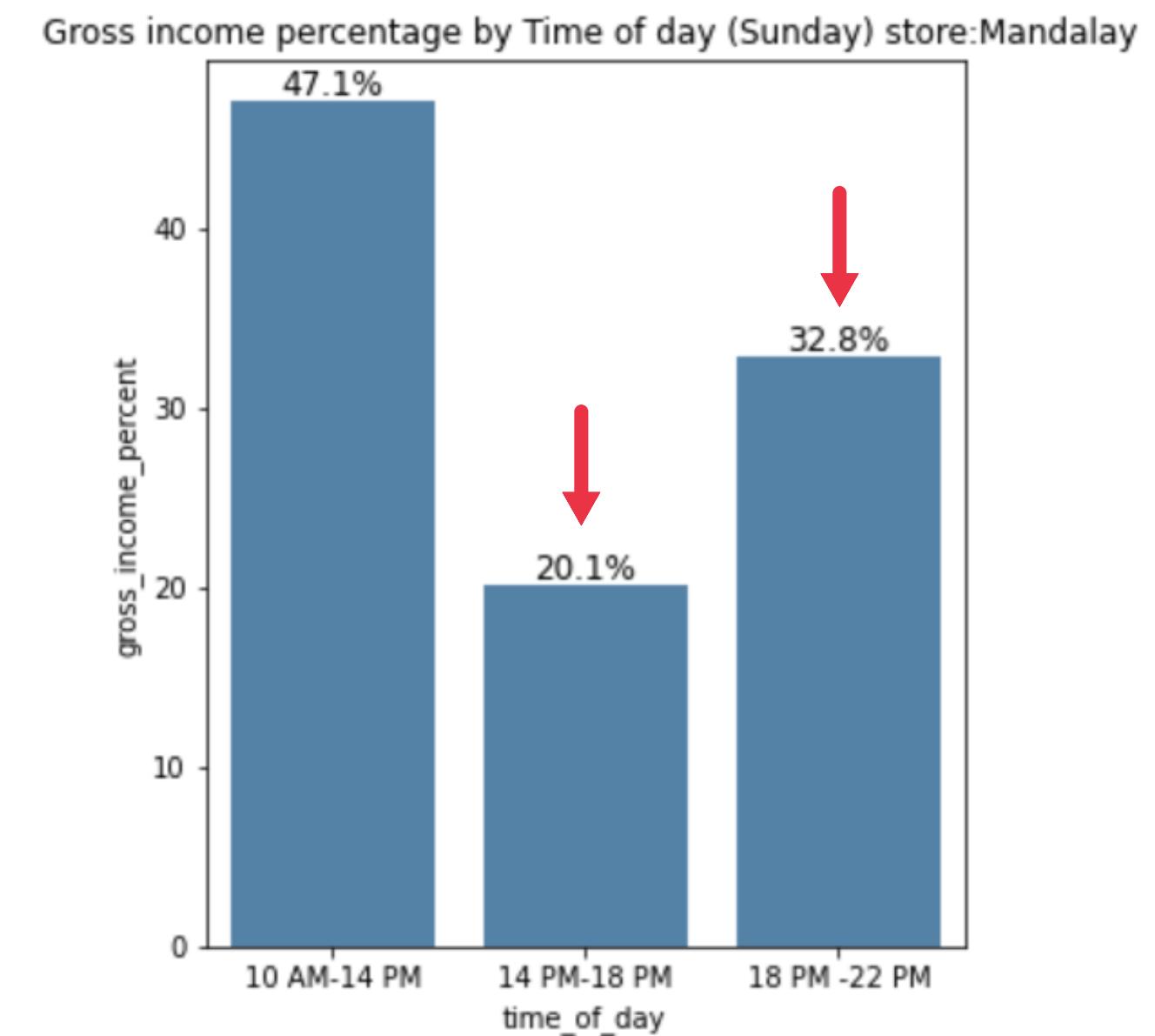
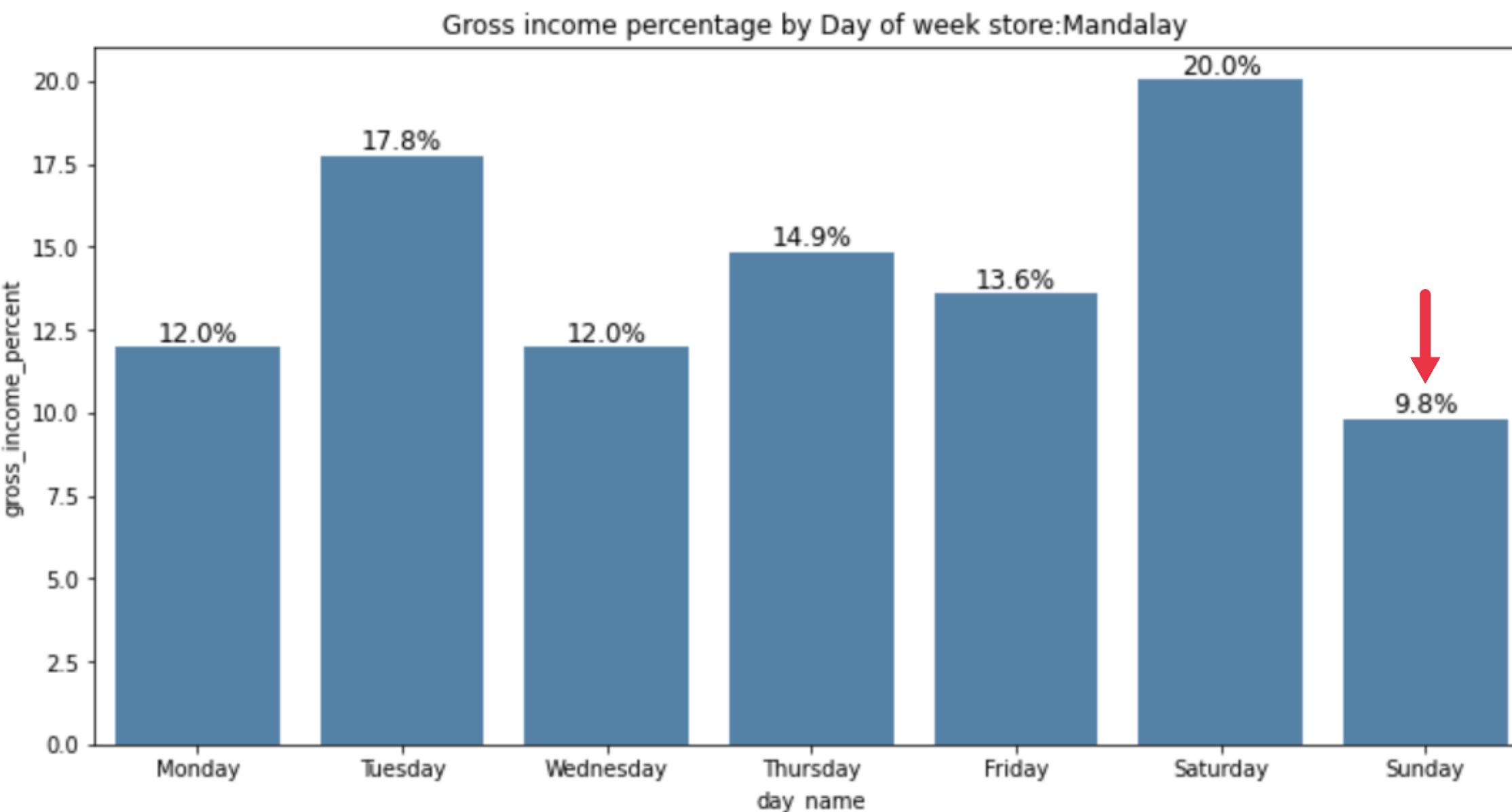
Wednesday [18.00 PM - 22.00 PM , 14.00 PM - 18.00 PM]

DAY AND TIME TO PROMOTION (NAYPYITAW)



- **Monday [10.00 AM - 14.00 PM , 18.00 PM - 22.00 PM]**

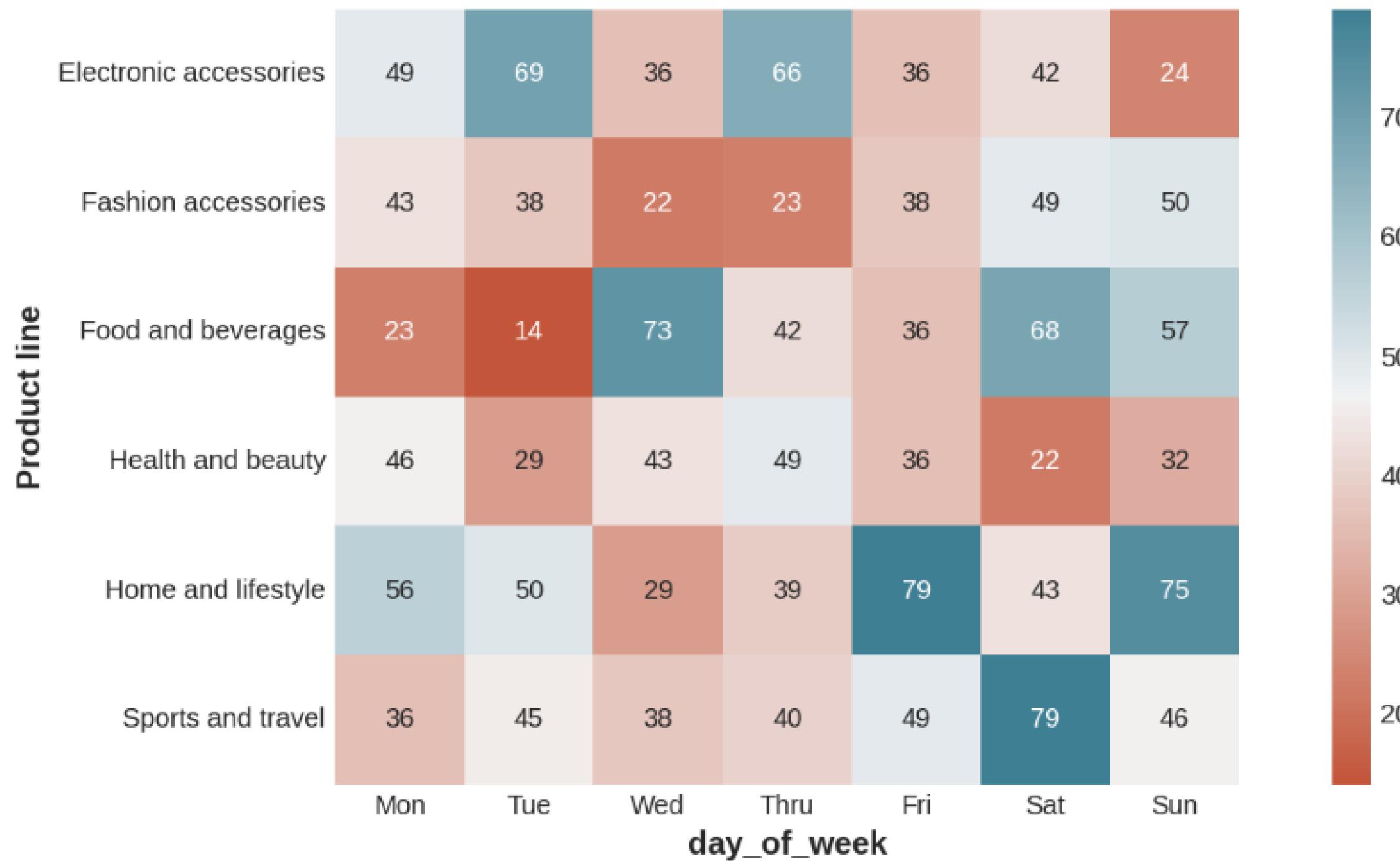
DAY AND TIME TO PROMOTION (MANDALAY)



- Sunday [14.00 PM - 18.00 PM , 18.00 PM - 22.00 PM]

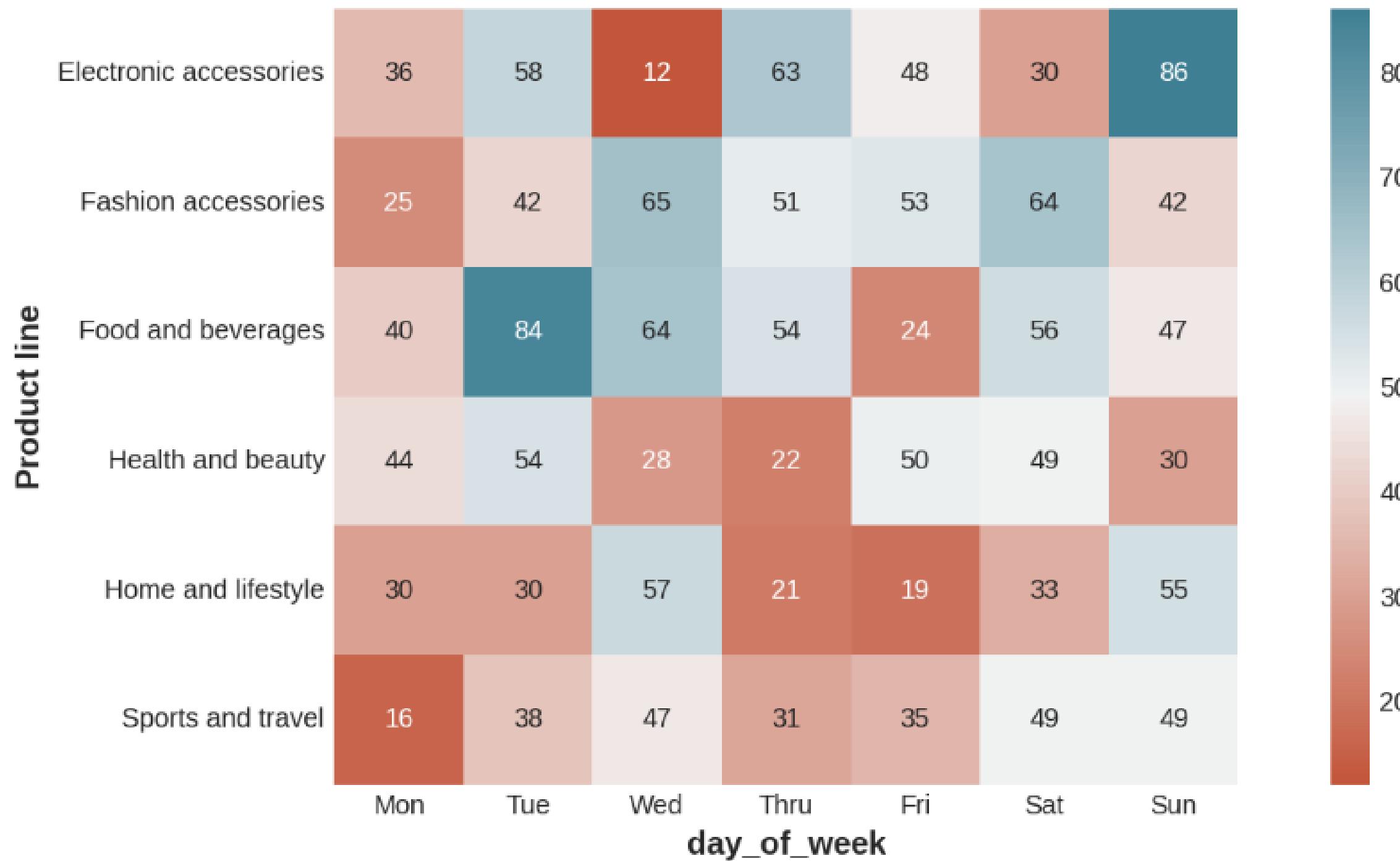
PRODUCT LINE QUANTITY WITH DAY OF WEEK (YANGON)

Total Product line quantity and Day of week Store Yangon



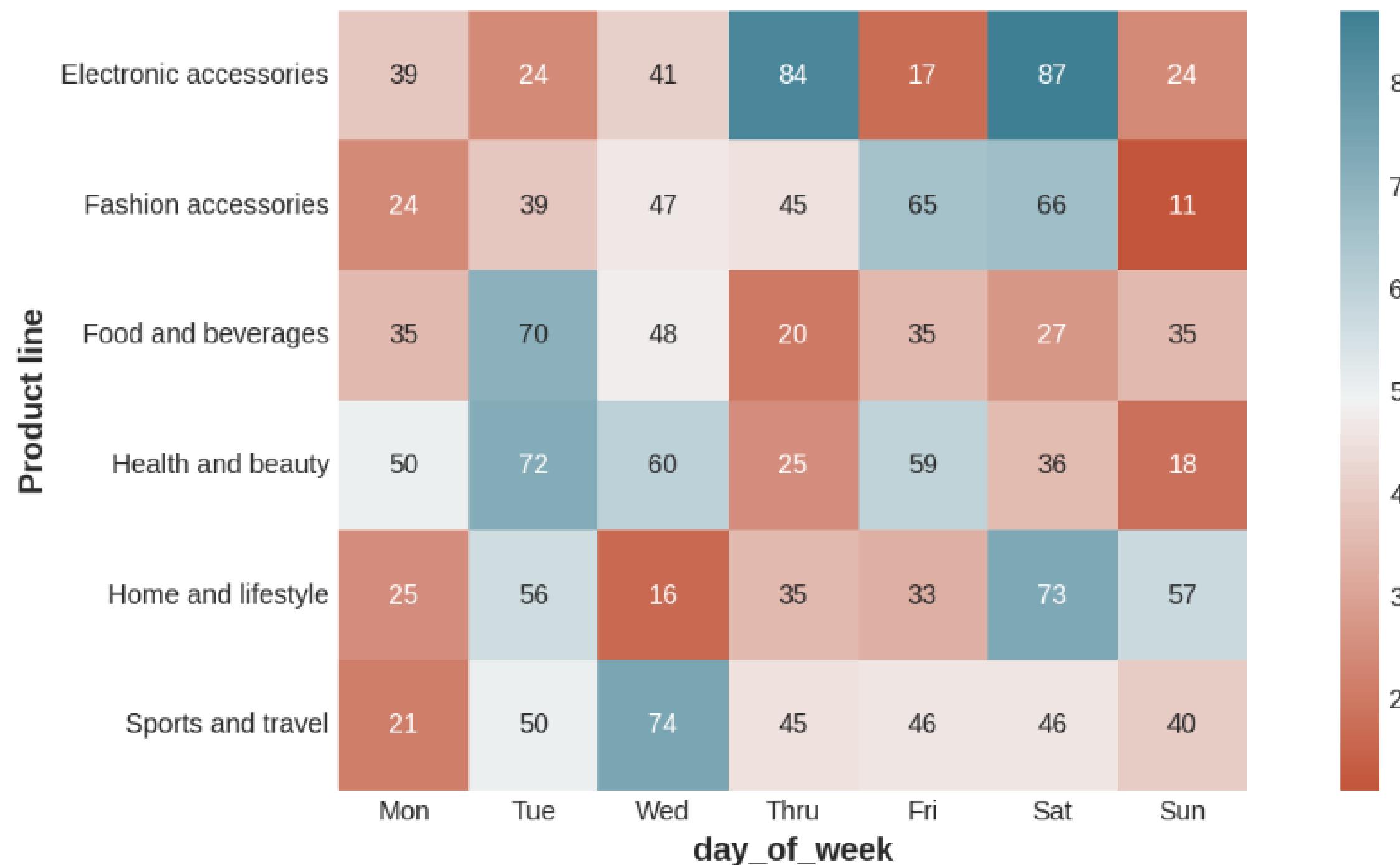
PRODUCT LINE QUANTITY WITH DAY OF WEEK (NAYPYITAW)

Total Product line quantity and Day of week Store Naypyitaw

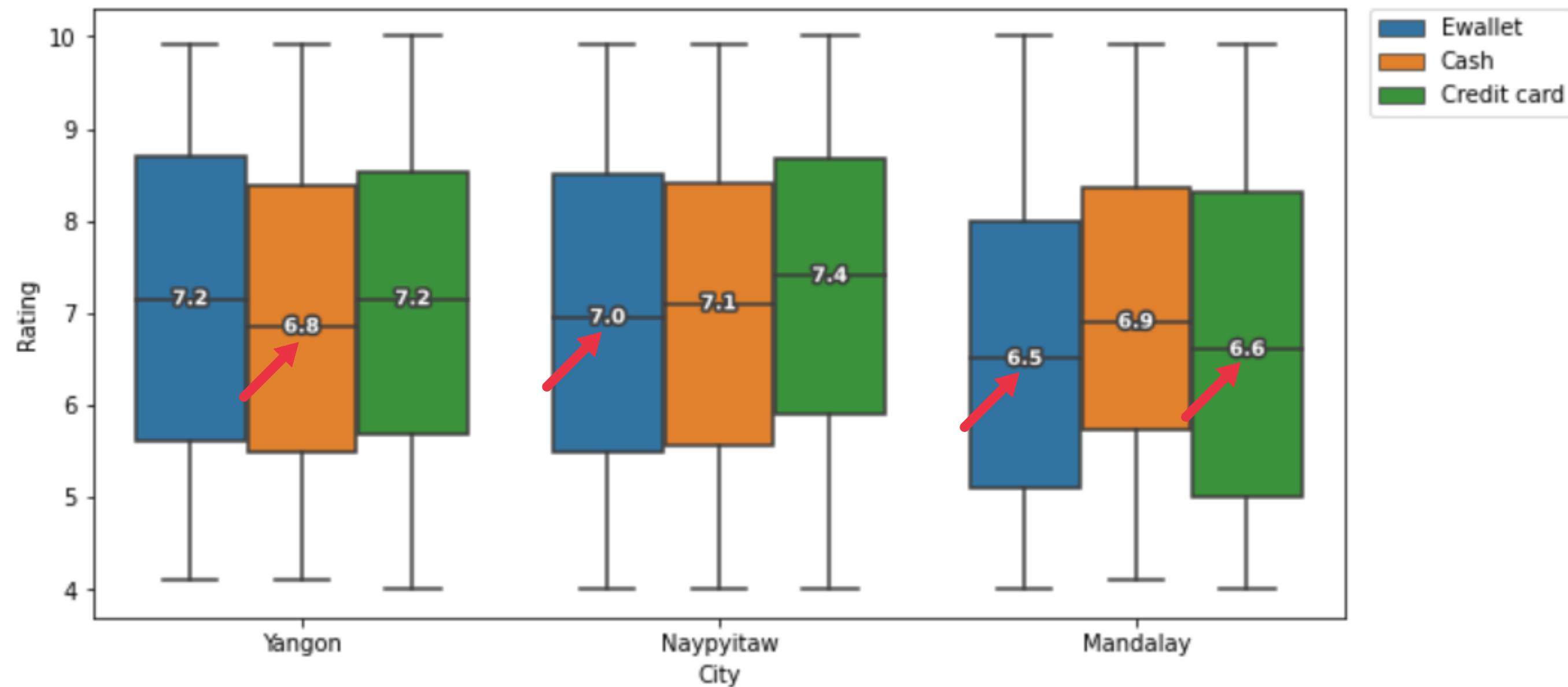


PRODUCT LINE QUANTITY WITH DAY OF WEEK (MANDALAY)

Total Product line quantity and Day of week Store Mandalay



PAYMENT AND CUSTOMER RATING



MODEL AND EVALUATION



1. Pipeline
2. Check trend and seasonal
3. Model fitting and Evaluate



PIPELINE

1

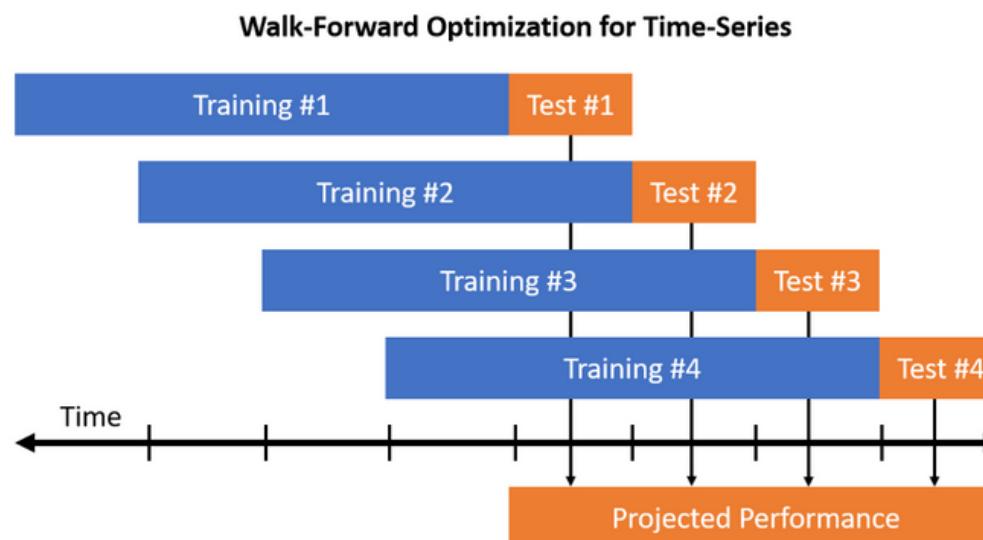
- Check Trend
- Check Seasonal

1. STL PLOT
2. Mann-Kendall
 - Trend `original_test`
 - Seasonal `seasonal_test`

2

- MODELING
- Train/Test Data

SimpleExpSmoothing(SES)
• good for no trend no seasonal



3

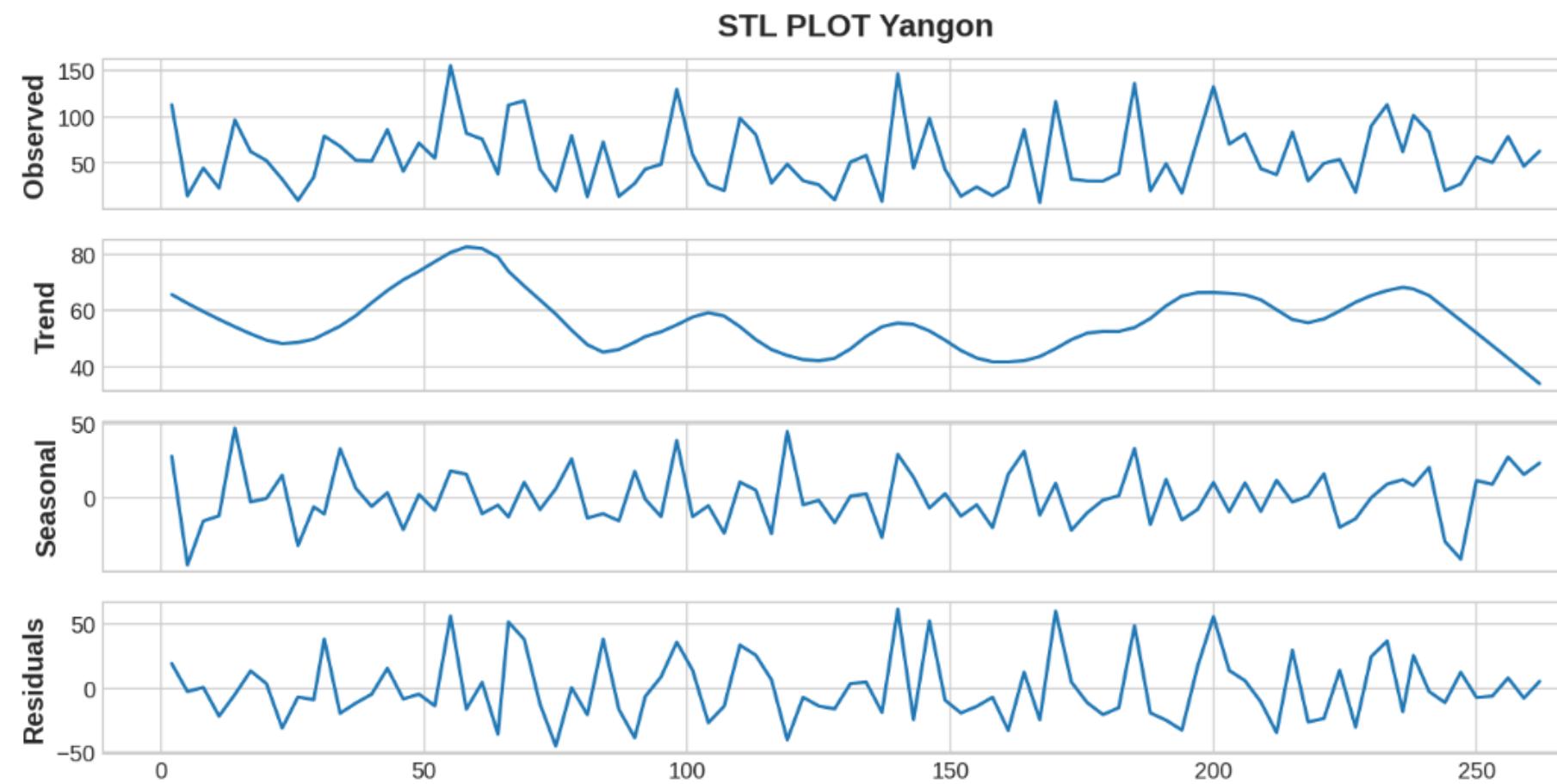
- Evaluate

Mean Absolute Percentage Error
(MAPE)

MAPE	Interpretation
< 10 %	Very good
10 % - 20 %	Good
20 % - 50 %	OK
> 50 %	Not good

credit <https://stephenallwright.com/interpret-mape/>

CHECK TREND AND SEASON (YANGON)



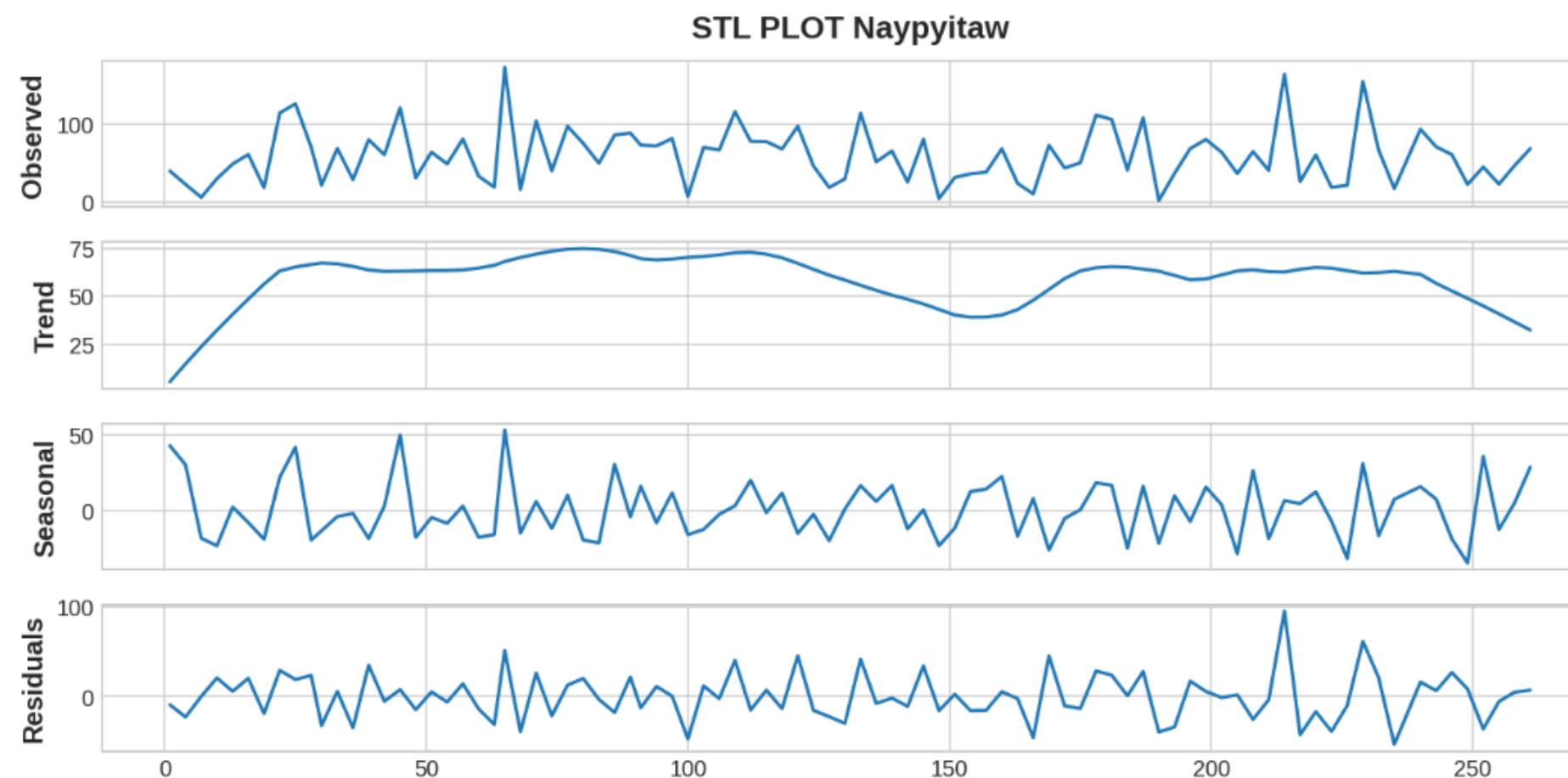
No Trend

Mann_Kendall_Test(trend='no trend'
Trend= no trend
P-value= 0.8732963105806515

No Seasonal

Seasonal_Mann_Kendall_Test(trend='no trend'
Trend= no trend
P-value= 0.8678054688148638

CHECK TREND AND SEASON (NAYPYITAW)



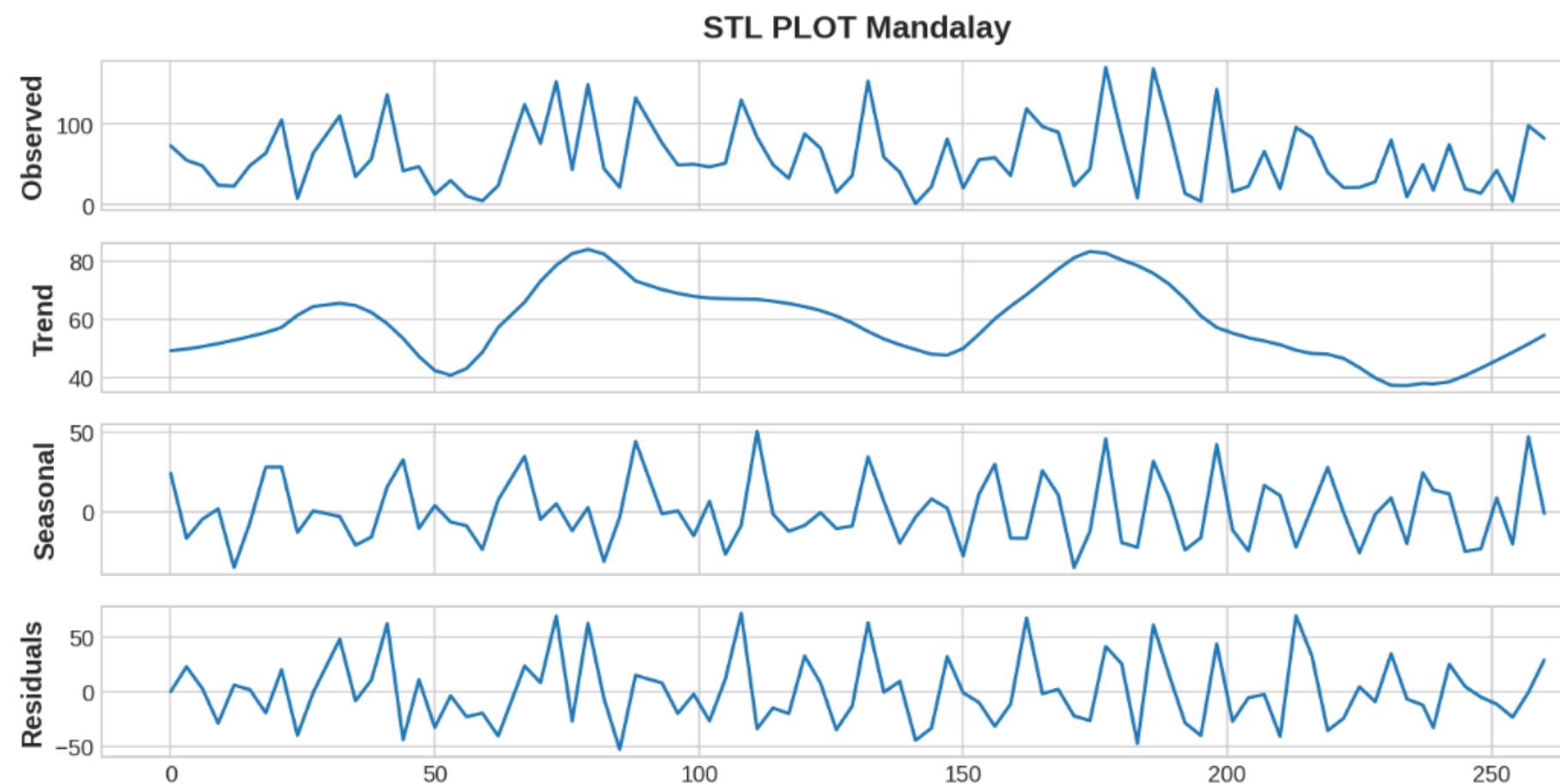
No Trend

Mann_Kendall_Test(trend='no trend')
Trend= no trend
P-value= 0.6316936518645107

No Seasonal

Seasonal_Mann_Kendall_Test(trend='no trend')
Trend= no trend
P-value= 0.3550661257279053

CHECK TREND AND SEASON (MANDALAY)



No Trend

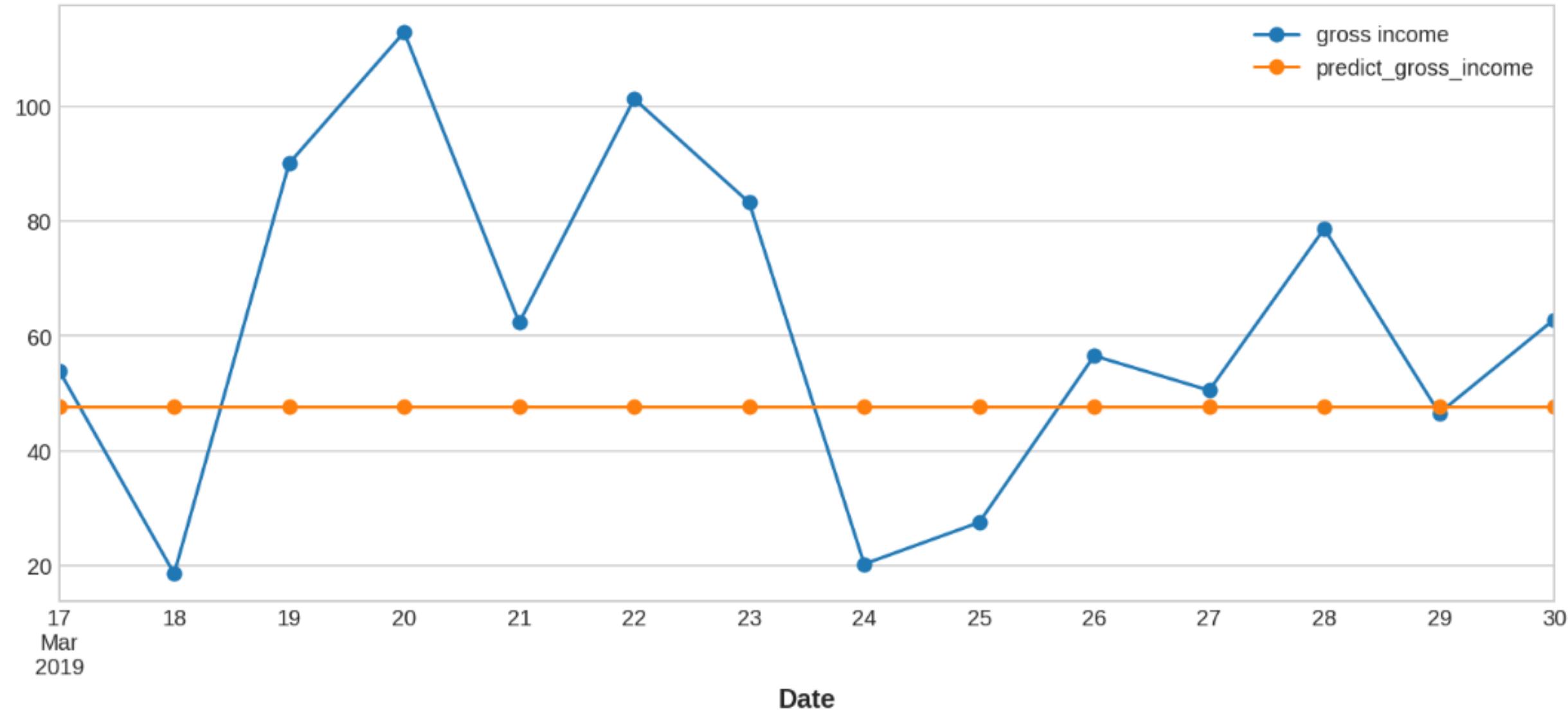
Mann_Kendall_Test(trend='no trend')
Trend= no trend
P-value= 0.3472579527252262

No Seasonal

Seasonal_Mann_Kendall_Test(trend='no trend')
Trend= no trend
P-value= 0.3550661257279053

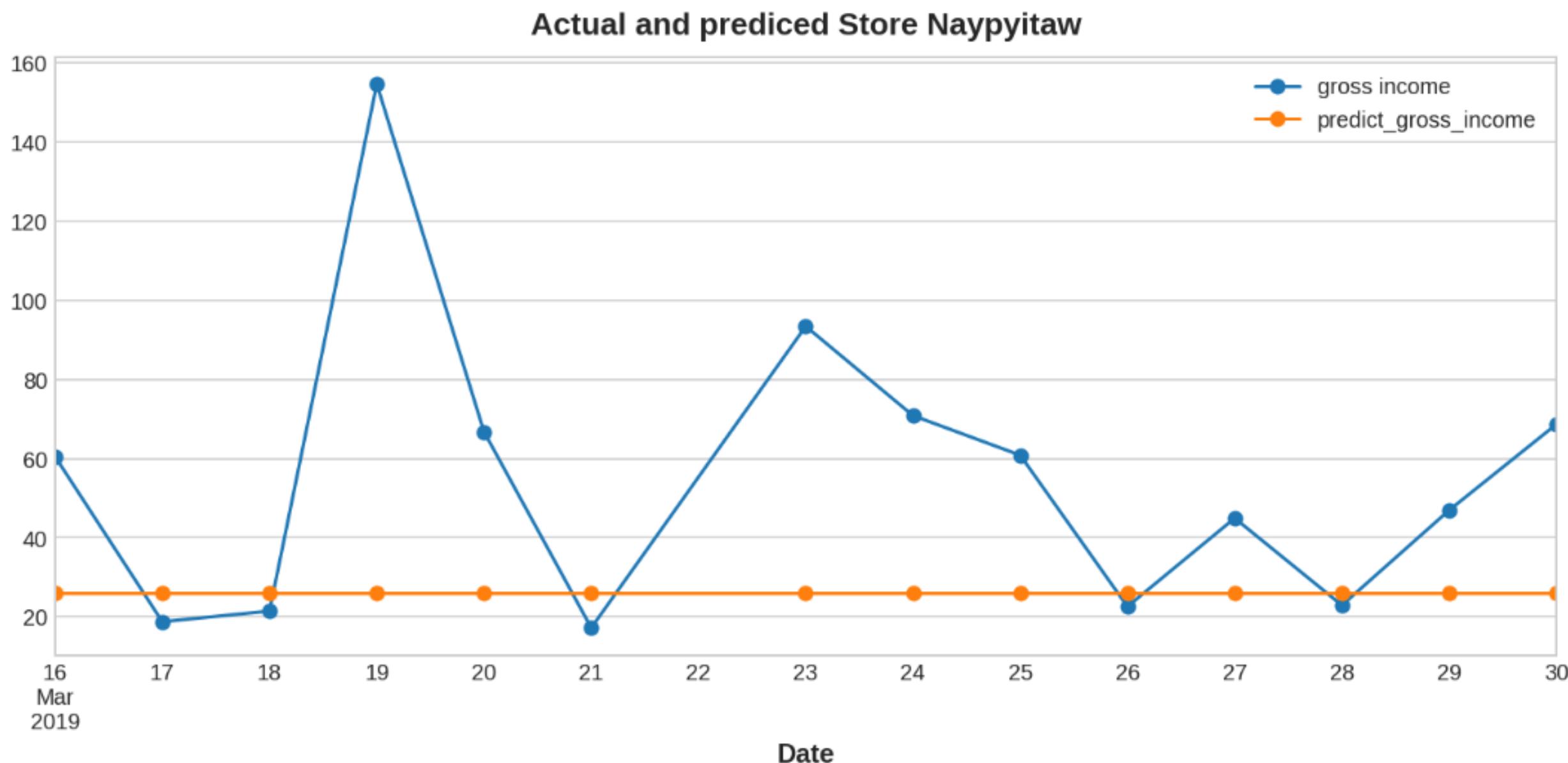
MODEL FITTING AND EVALUATE (YANGON)

Actual and predicted Store Yangon



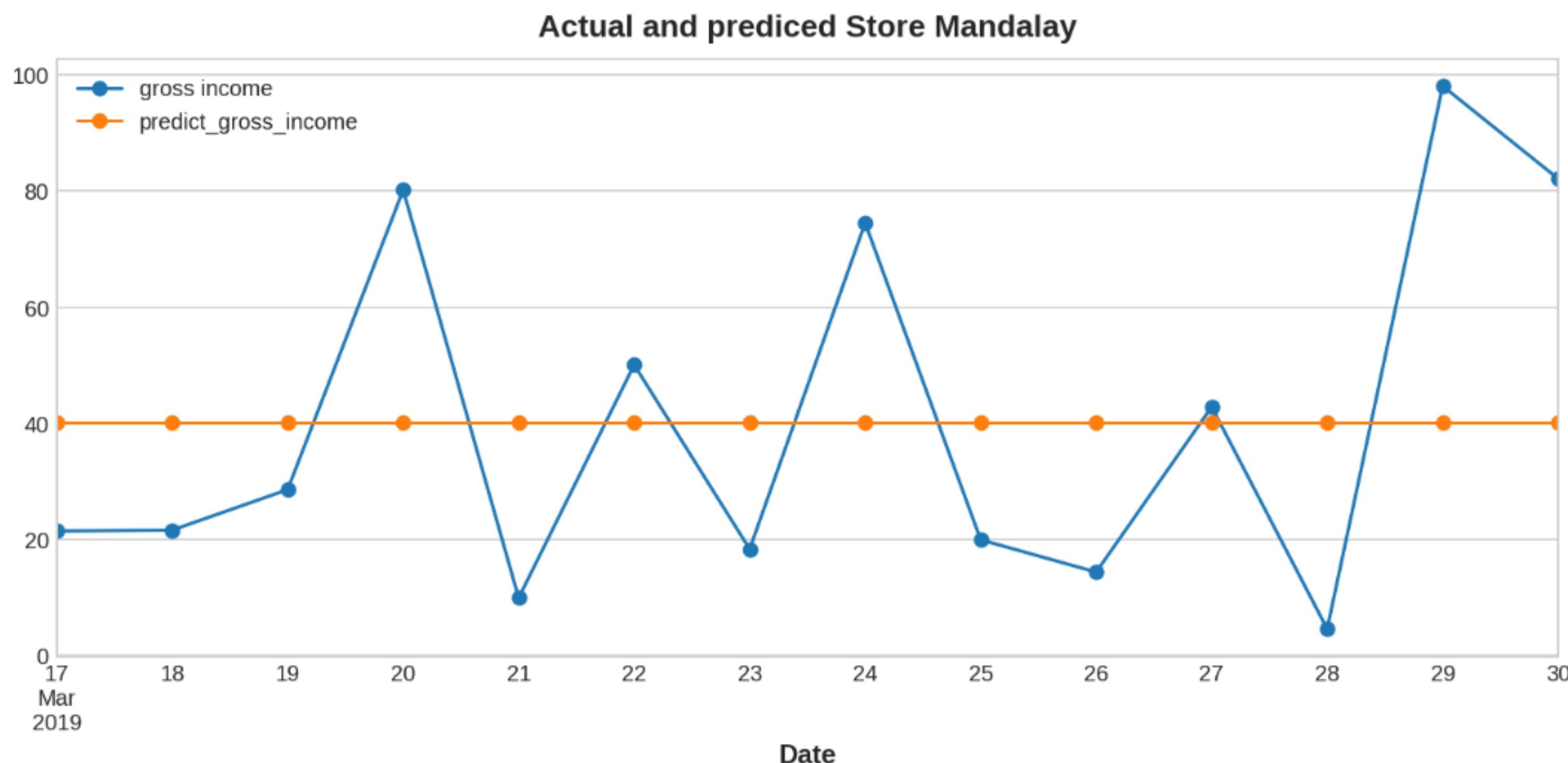
Alpha = 0.7
MAPE = 49%

MODEL FITTING AND EVALUATE (NAYPYITAW)



Alpha = 1.0
MAPE = 48%

MODEL FITTING AND EVALUATE (MANDALAY)



Alpha = 1.0
MAPE = 137%

RESULT AND RECOMMENDATION

4

1. Store recommendation
2. Need support



STORE RECOMMENDATION

YANGON

PROMOTION ON

- Wednesday
18.00 PM - 22.00 PM
14.00 PM - 18.00 PM

Check Payment type service

- Cash

Can Forecast Daily gross income

- **MAPE 49% (OK)**

NAYPYITAW

PROMOTION ON

- Monday
10.00 AM - 14.00 PM
18.00 PM - 22.00 PM

Check Payment type service

- E-Wallet

Can Forecast Daily gross income

- **MAPE 48% (OK)**

MANDALAY

PROMOTION ON

- Sunday
14.00 PM - 18.00 PM
18.00 PM - 22.00 PM

Check Payment type service

- E-Wallet
- Credit card

Can not Forecast Daily gross income

- **MAPE 137% (NOT GOOD)**

NEED SUPPORT

MORE DATA

1. Don't have enough data for detect Trend Seasonal and Cycle to forecast gross income .
2. Need all item in invoice id data for Basket Analysis .
3. Need detail from rating field for improve customer experience .

Q&A

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THANK YOU :)