# Difficulties of seasonal ARIMA model

## Reasons

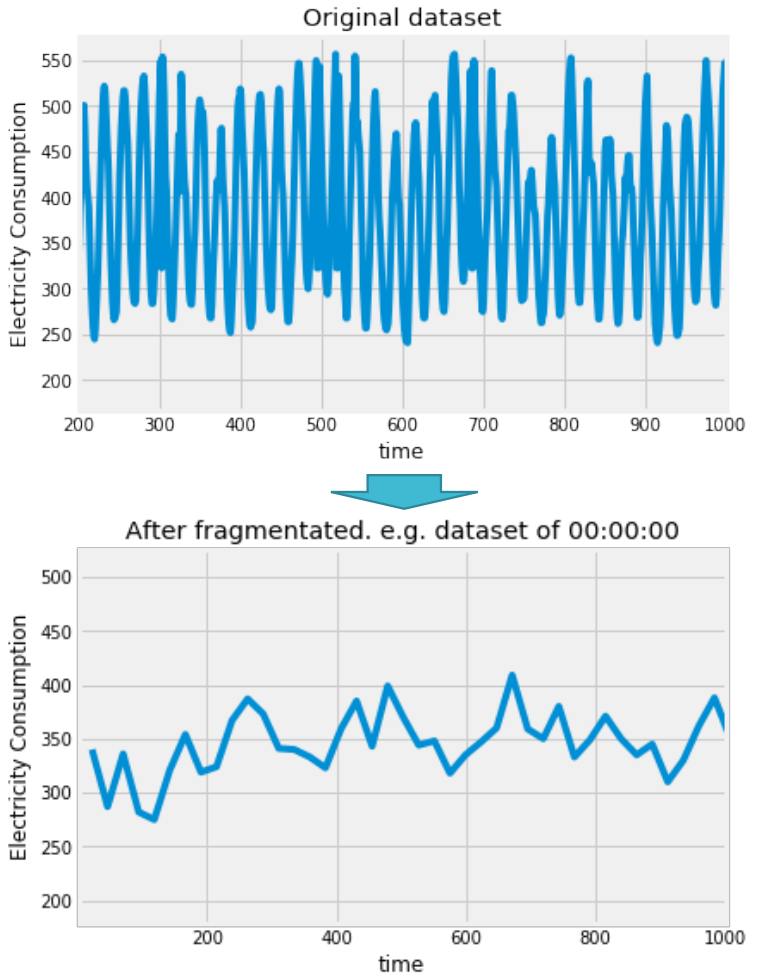
- Hourly data : Too huge size of dataset (24 hrs X 354 days = 8760 data / year)
- Multi Seasonality : daily, weekly, monthly, yearly. Too much overlapped seasonality.

## Consequences

- Too many ACF / PACF plotting to identify (p,d,q) components
- Time consuming : Takes more than 24 hours per each executing of seasonal auto ARIMA

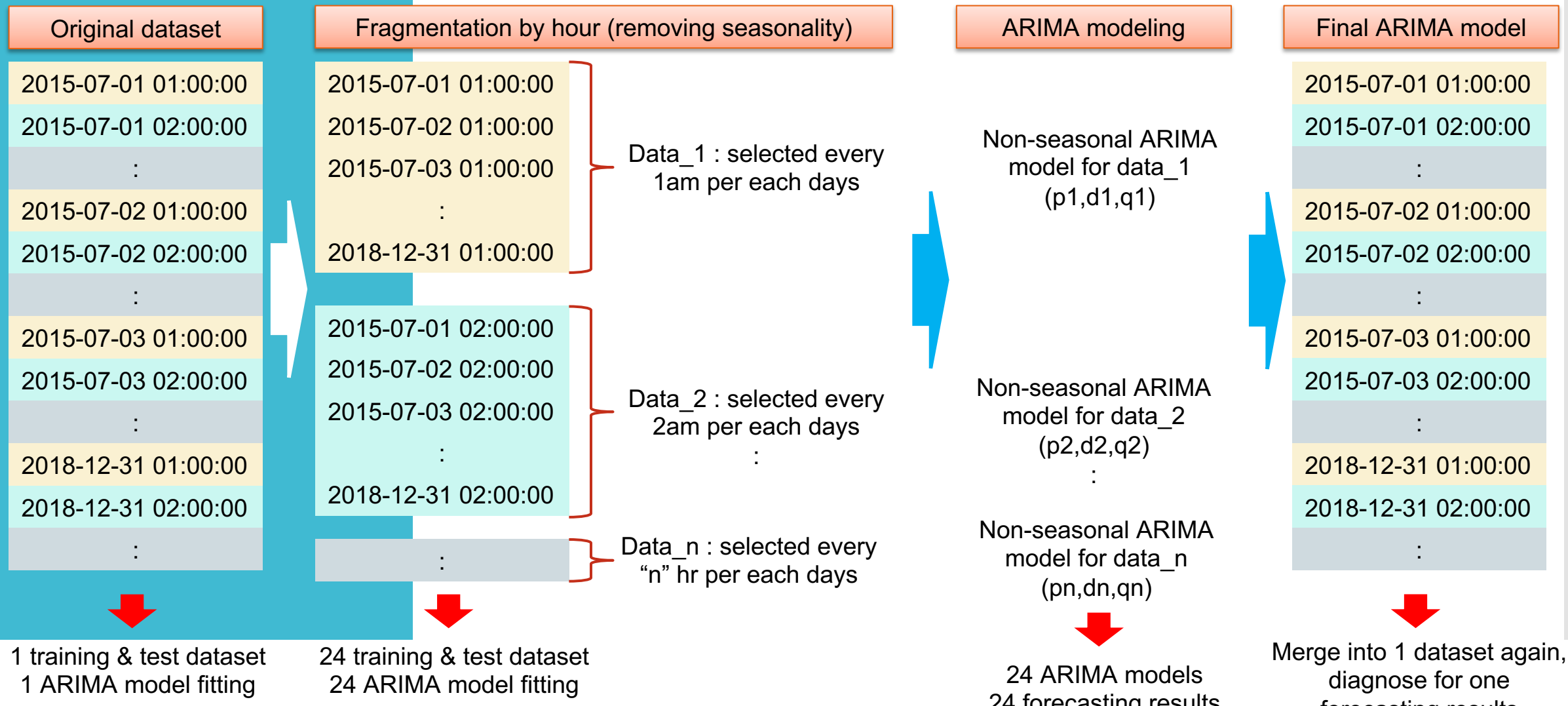
## Solution

- Temporally remove seasonality during model building and restore dataset in the end

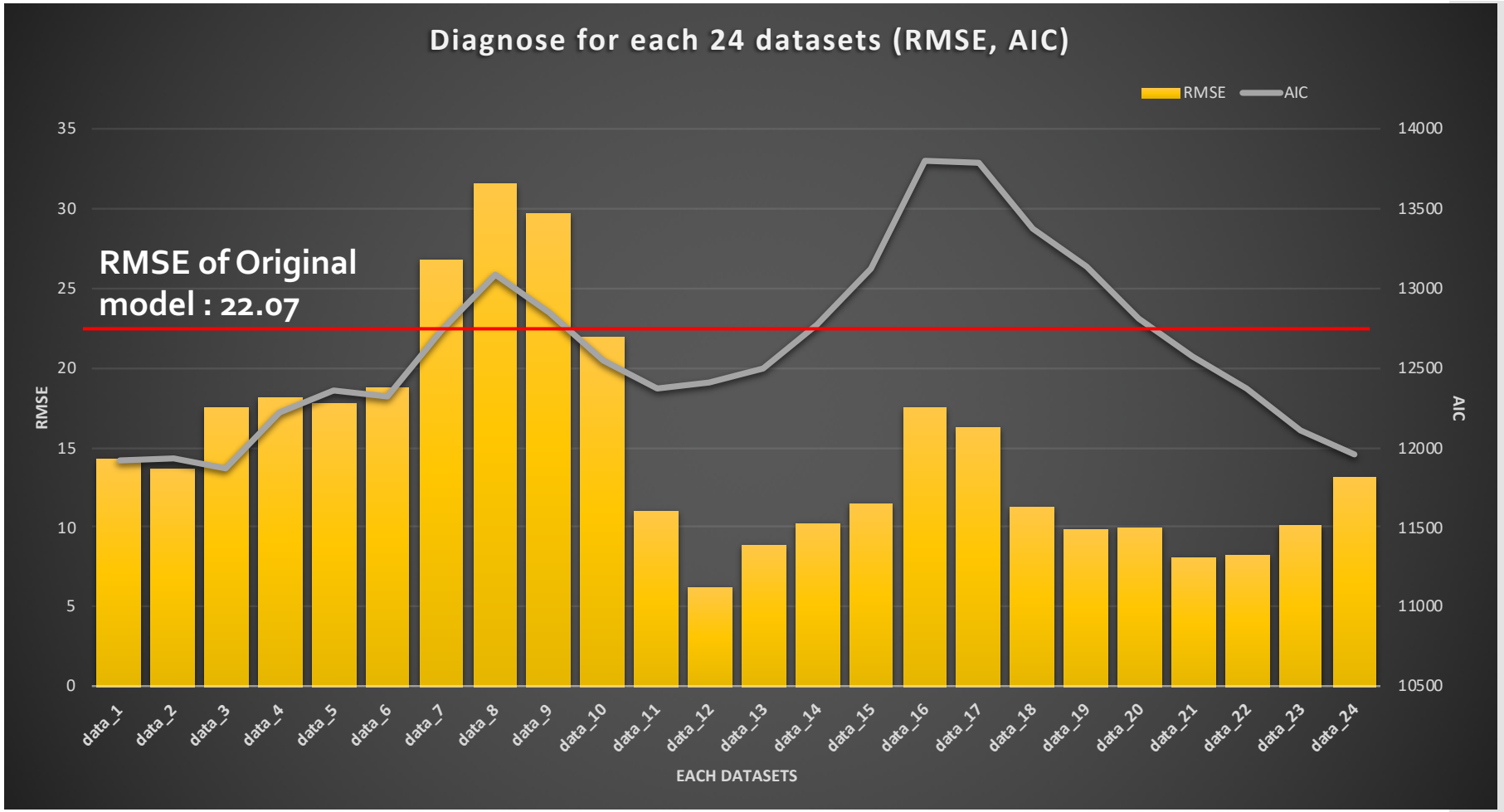


# Idea to overcome trouble of multi-seasonality

## : Fragmenting of input dataset

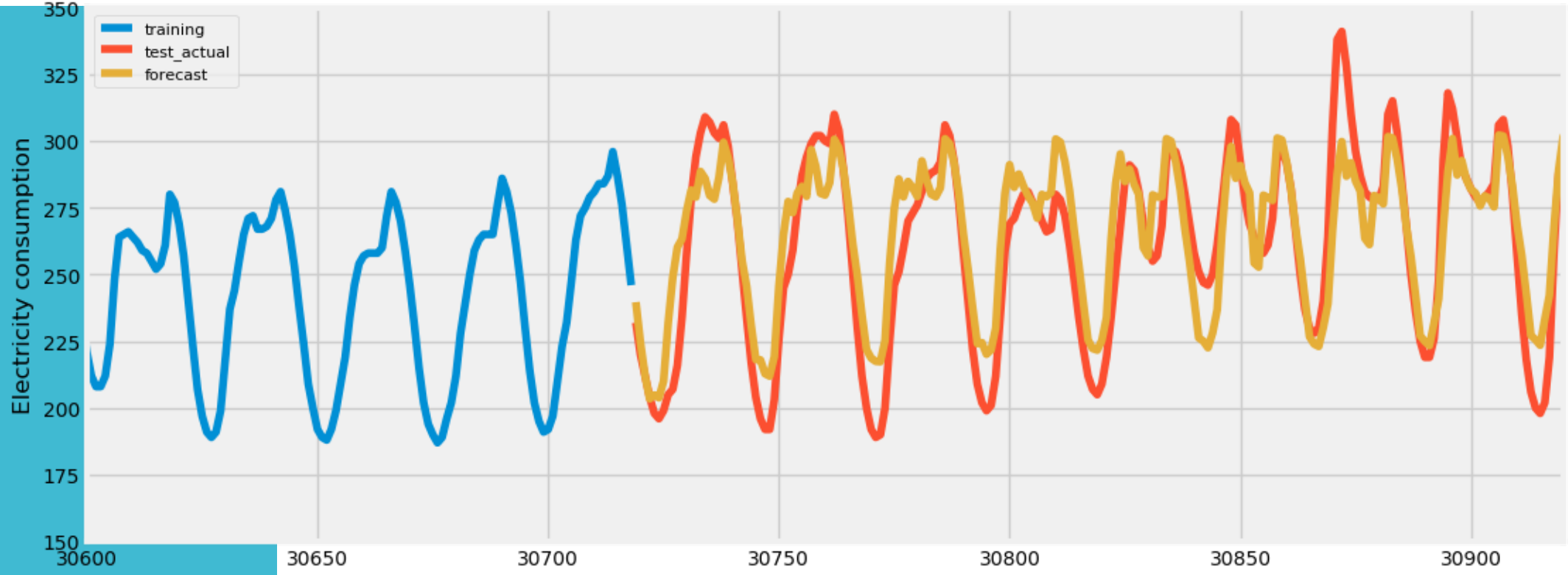


# Results




| Data set | Data 1 | Data 2 | Data 3 | Data 4 | Data 5 | Data 6 | Data 7 | Data 8 | … | Data 16 | Data 17 | Data 18 | Data 19 | Data 20 | Data 21 | Data 22 | Data 23 | Data 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (p,d,q) | (2,0,1) | (1,1,1) | (5,0,3) | (1,1,1) | (3,0,0) | (3,0,0) | (1,1,1) | (1,1,1) | … | (1,1,0) | (1,1,0) | (3,1,2) | (4,0,3) | (4,0,1) | (3,0,3) | (3,0,3) | (3,0,3) | (2,0,1) |

# Results




| Indicators | mape | me | mae | mpe | rmse | R-square | Forecasting period |
|---|---|---|---|---|---|---|---|
| Result | 0.0565 | 3.9241 | 13.7315 | 0.0240 | **17.1143 (22.0900)*** | **0.8295 (0.9332)*** | **48 hours (24 hours)*** |

* Result of original forecasting model

# Python Script

- https://github.com/aelee-im/Portfolio_Data-Analytic-Projects/blob/main/ARIMA.ipynb