Retail-Giant Case Study

SUBMISSION

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Abstract

Problem Statement:

- Global Mart is an online store super giant having worldwide operations. It takes orders and delivers across the globe and deals with all the major product categories - consumer, corporate & home.
- The goal is to finalize the plan for the next 6 months. So, you want to forecast the sales and the demand for the next 6 months, that would help you manage the revenue and inventory accordingly.

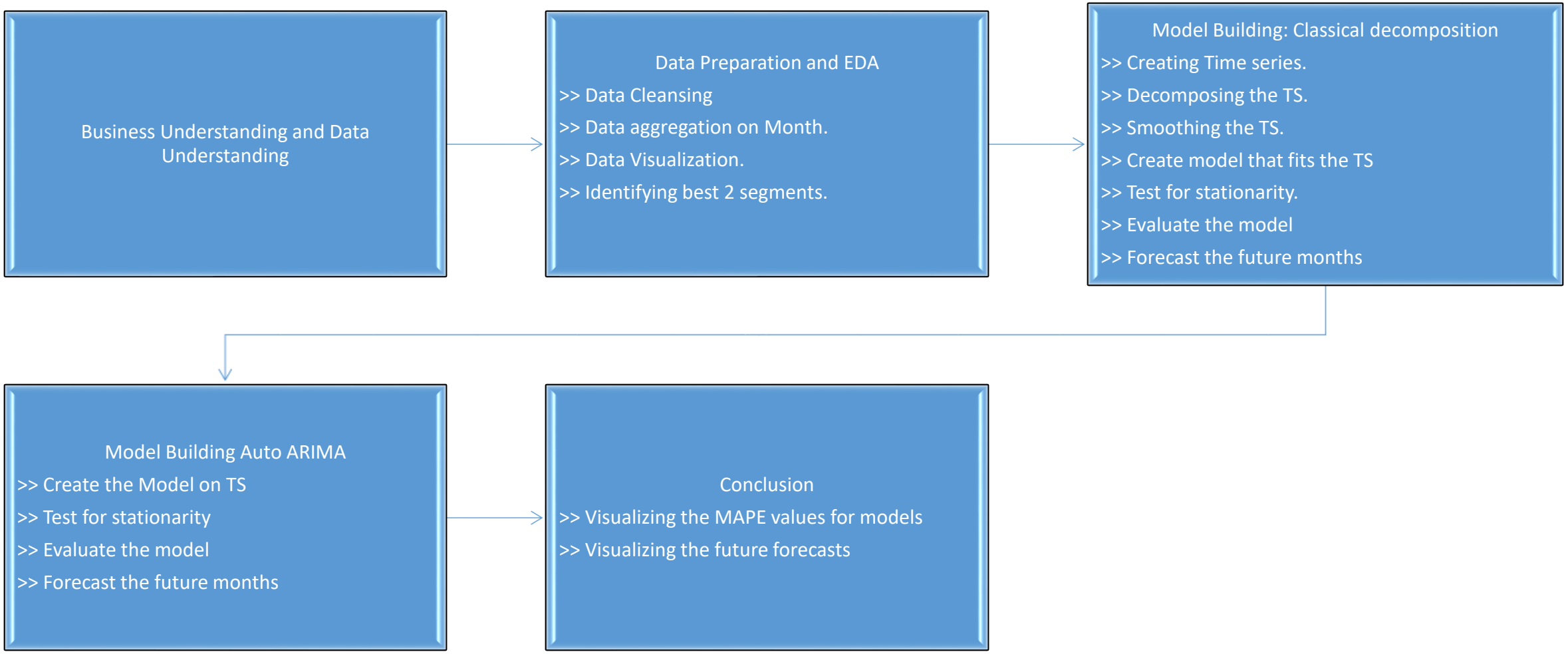
Objectives of the Analysis:

- Identify the 2 most profitable and consistent market segment for the company.
- Forecast the sales and demand for the next 6 months.

Solution Approach:

- R is used for Data preparation, from raw data sources.

Solution Approach



Data Understanding and Preparation

Data Understanding

- Raw data contains 51290 rows of transactional order data.
- Broadly the data is divided in 3 segments
- Further it can be divided to 7 Markets (Geographies).

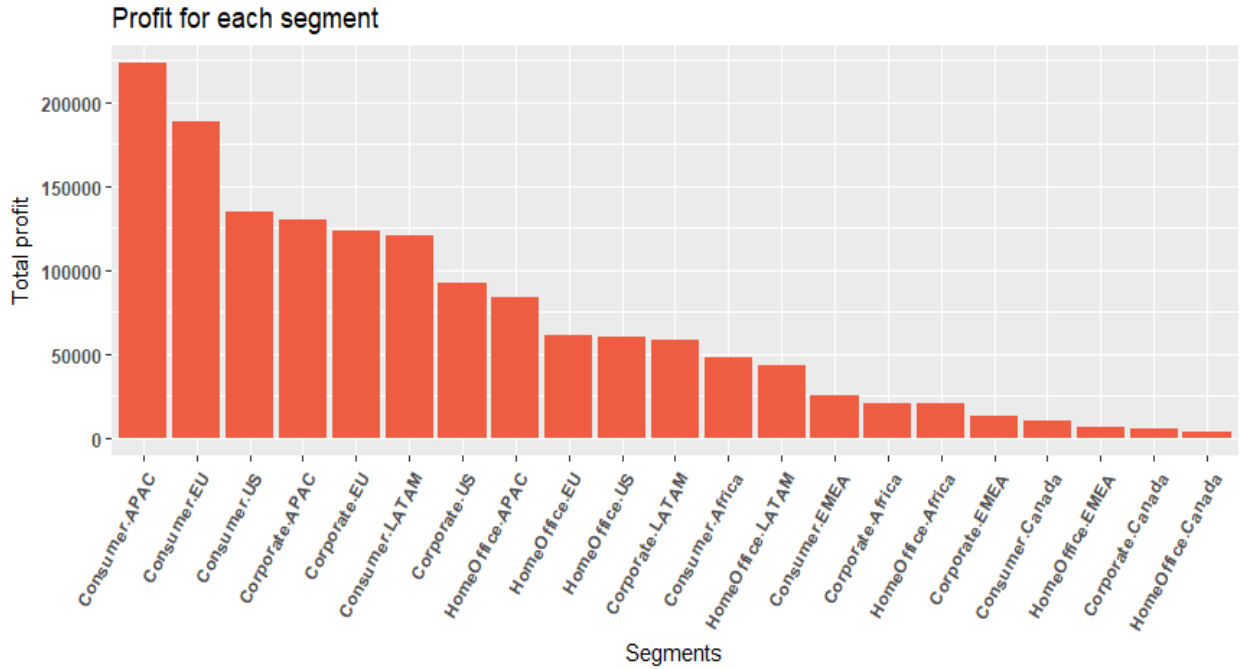
Data Preparation

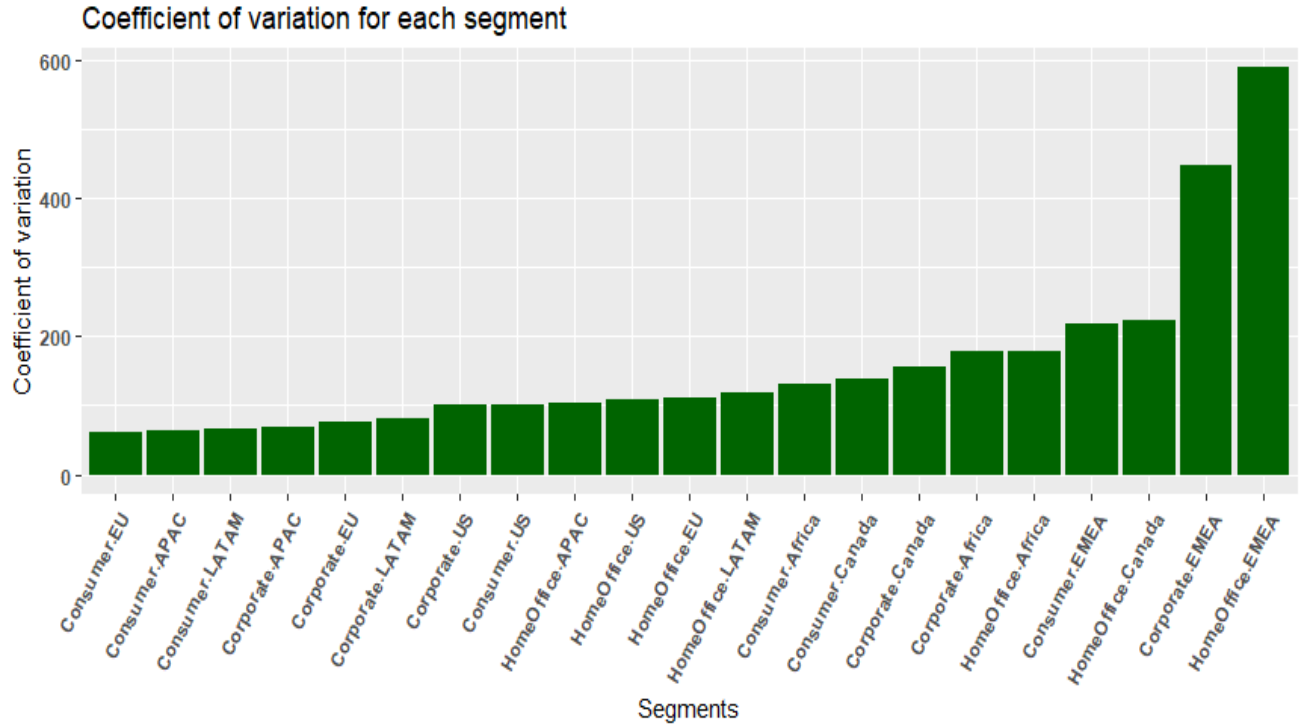
- Convert the Order Date column to Date format and extract month.
- Create subsets of data for all 21 market segments.
- Aggregate all data sets on month and calculate Coefficient of variance.
- Identify 2 most consistently profitable segments.
- Create time series for sales and quantity. (Keeping last 6 months as test data).

Identifying best segments

The 2 most profitable segments are

1. Segment Consumer and Market APAC
2. Segment Consumer and Market EU



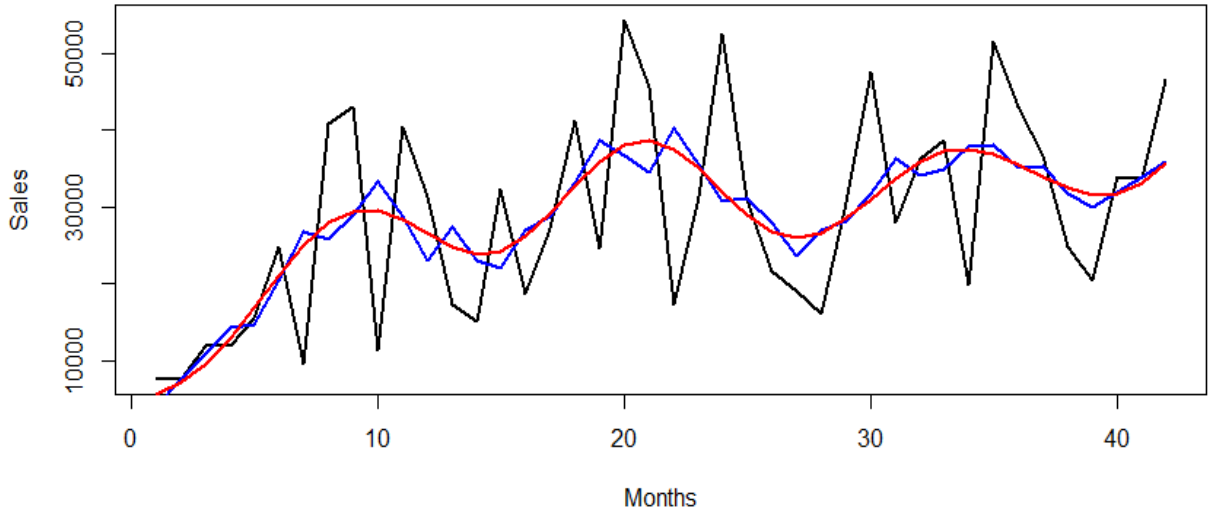


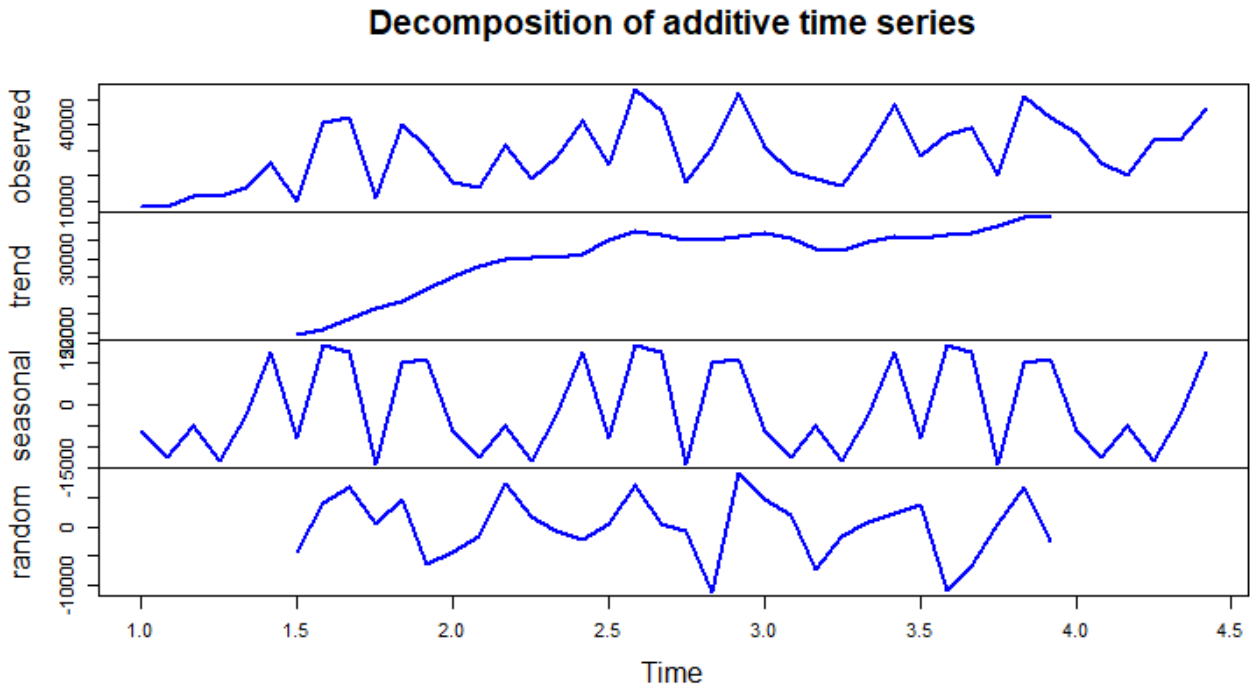
The 2 most consistently profitable segments are

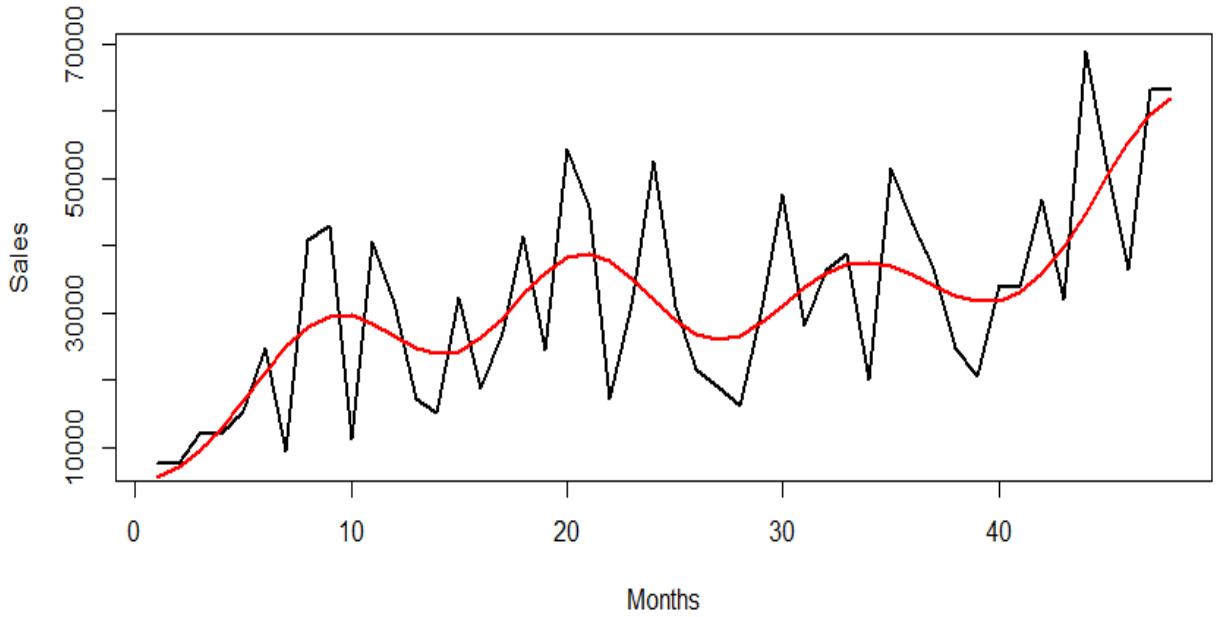
1. Segment Consumer and Market APAC
2. Segment Consumer and Market EU

Classical Decomposition
Consumer EU Sales Forecast

- The TS shows and additive model.
- The TS shows a linear upward trend
- The seasonality shows a sinusoidal seasons yearly.

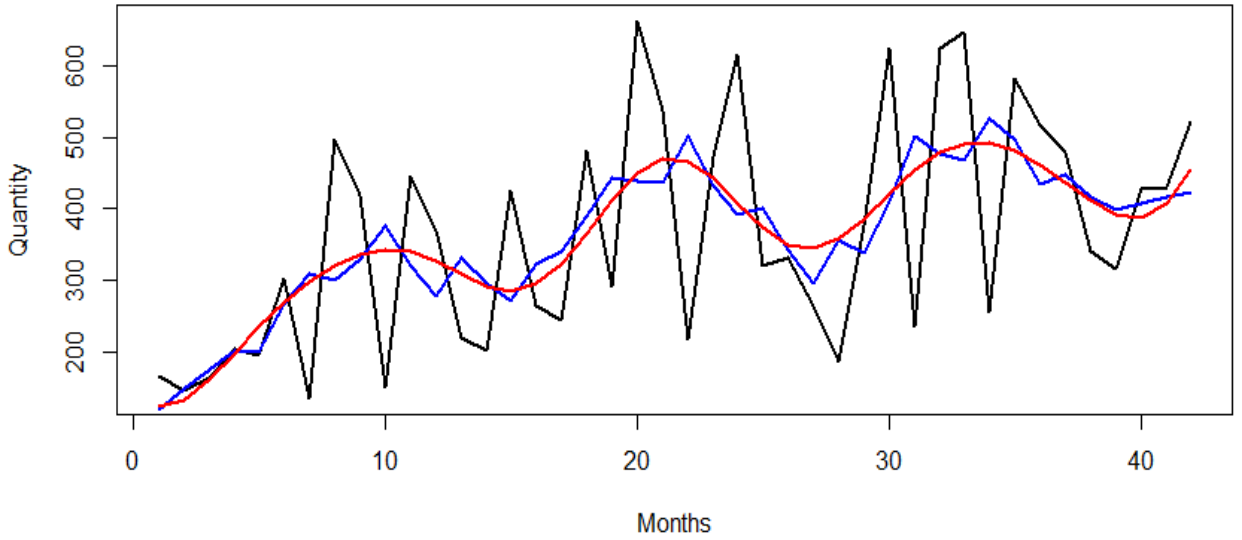


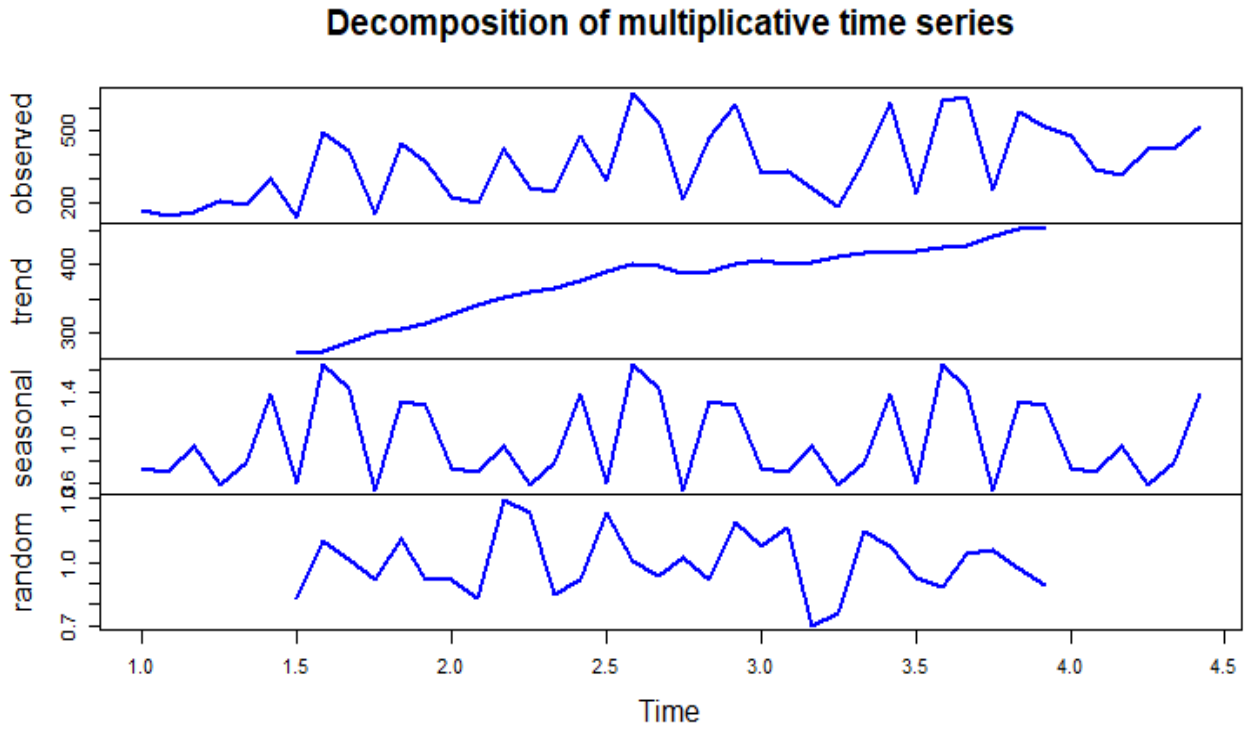


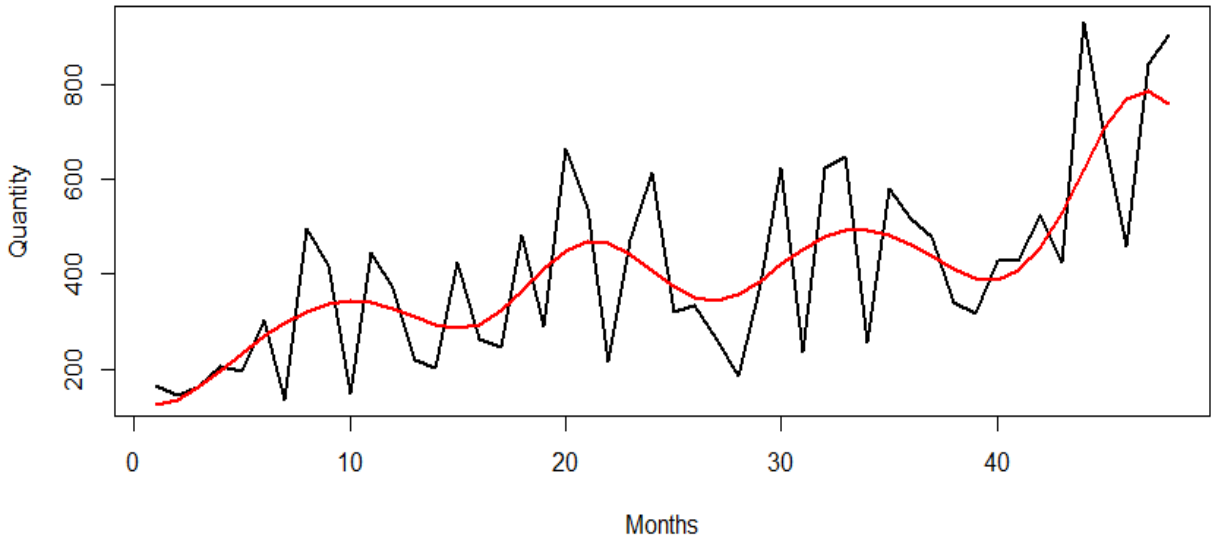


Classical Decomposition
Consumer EU Quantity Forecast

- The TS shows a linear upward trend
- The seasonality shows a sinusoidal seasons yearly.







Classical Decomposition
Consumer APAC Sales Forecast

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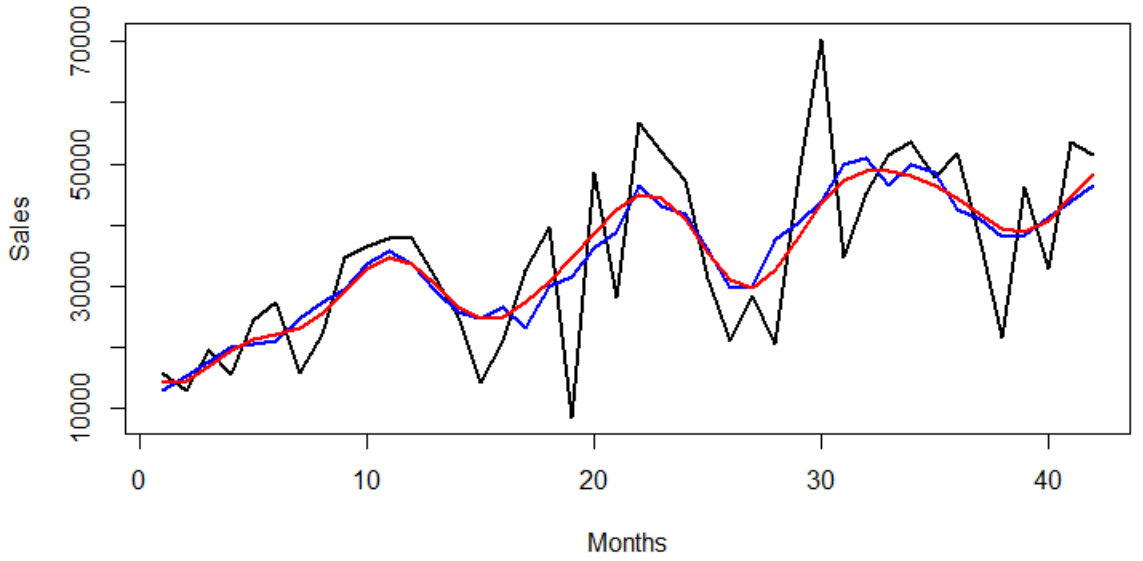
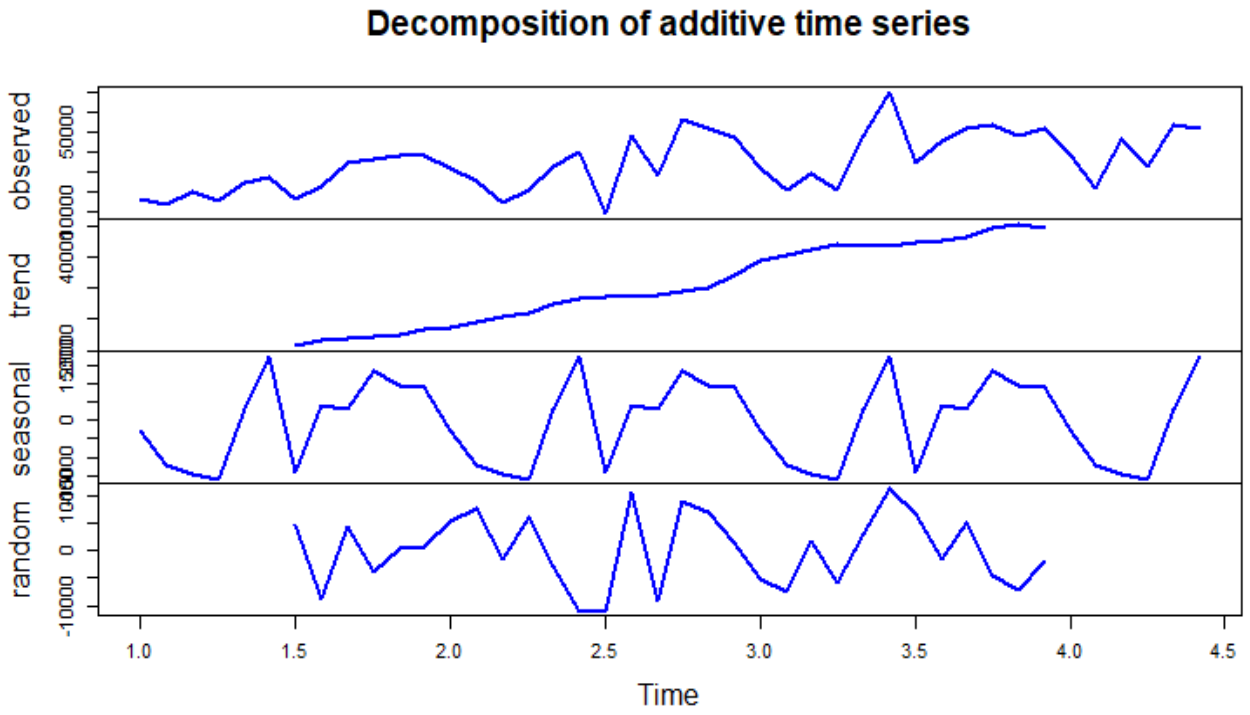
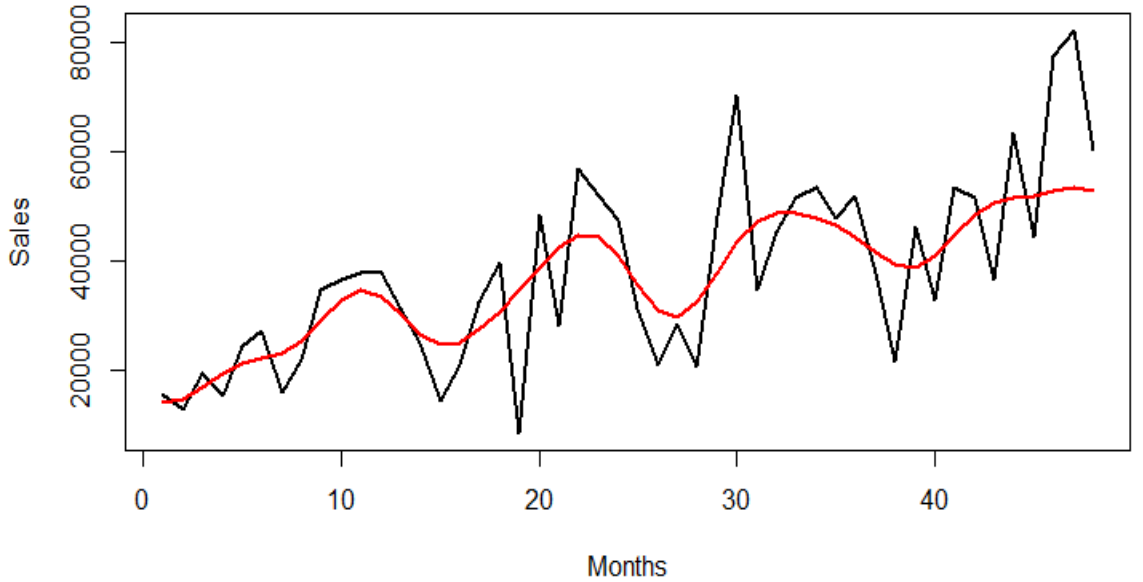
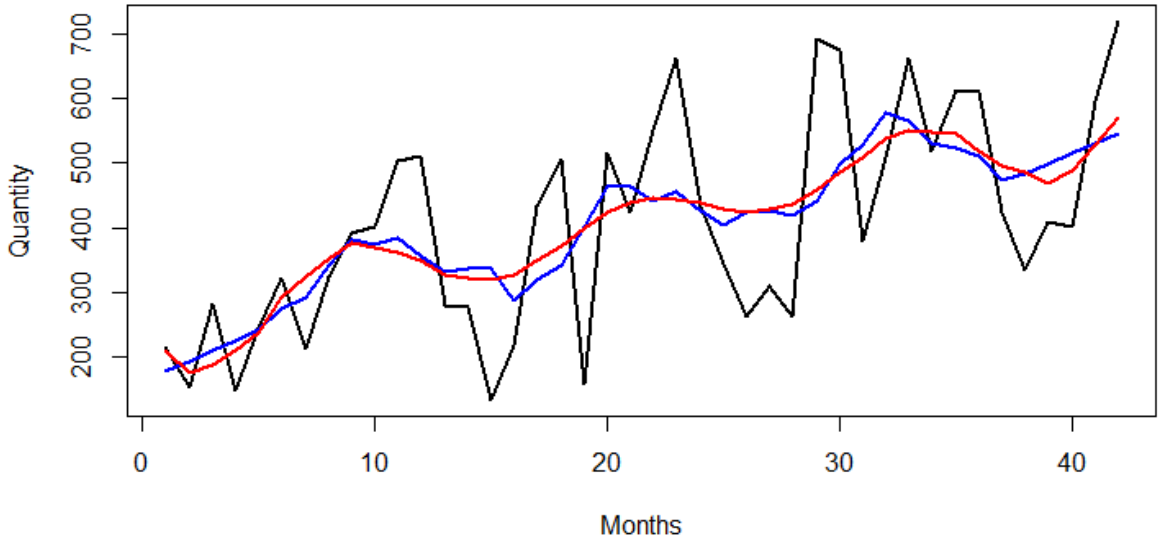


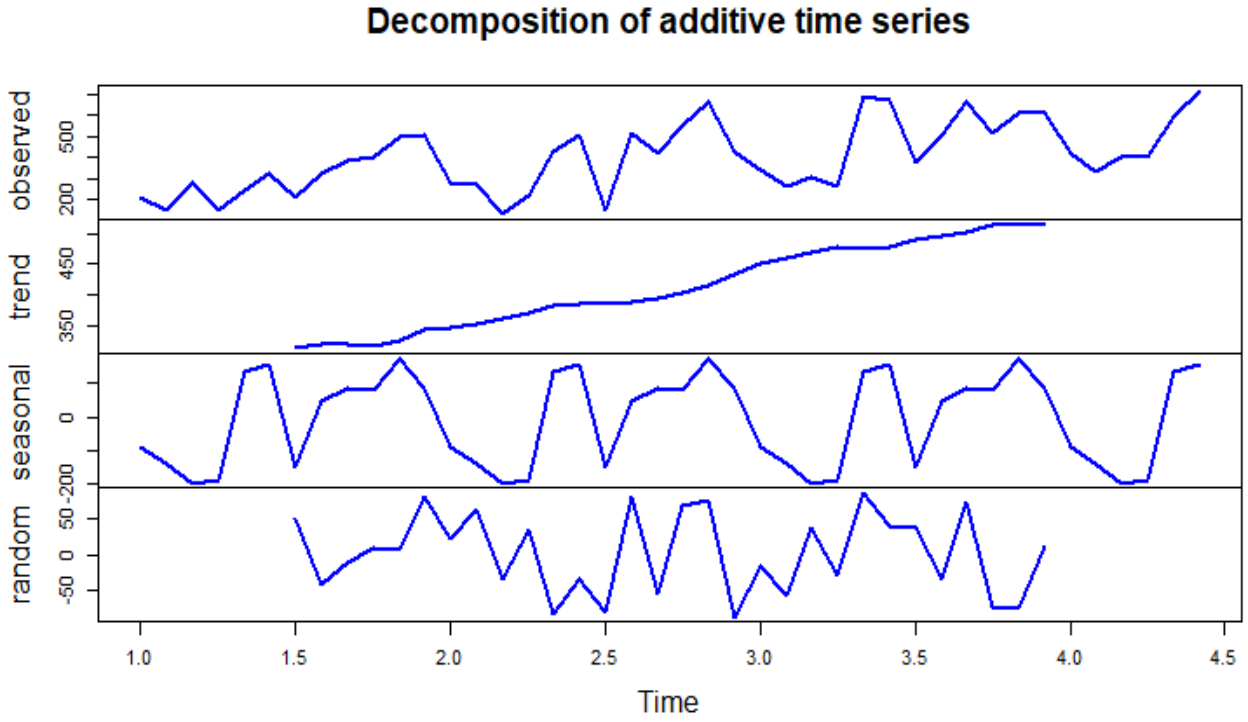


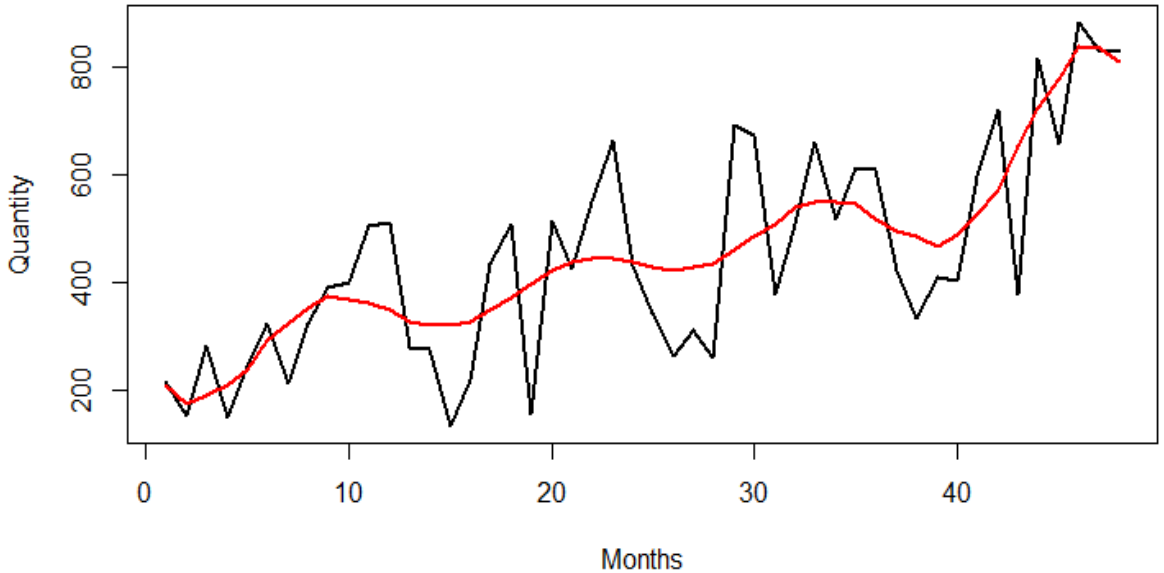


Classical Decomposition
Consumer APAC Quantity Forecast

- The TS shows a linear upward trend
- The seasonality is yearly.

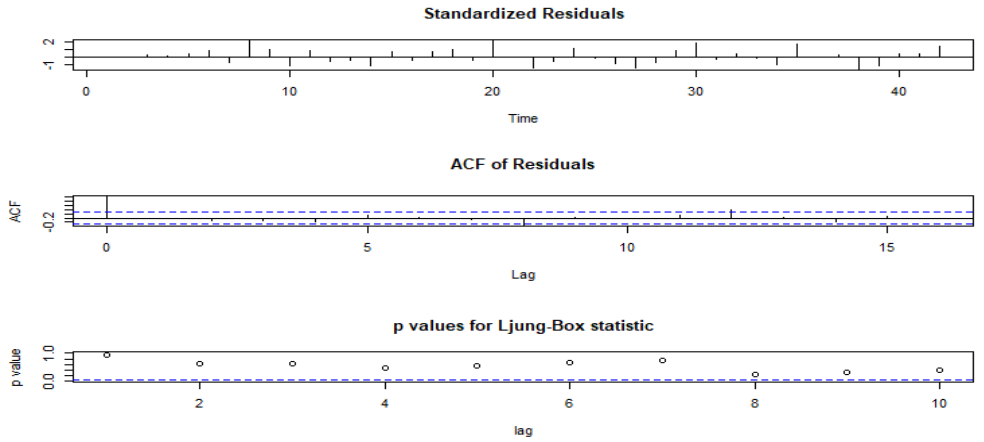


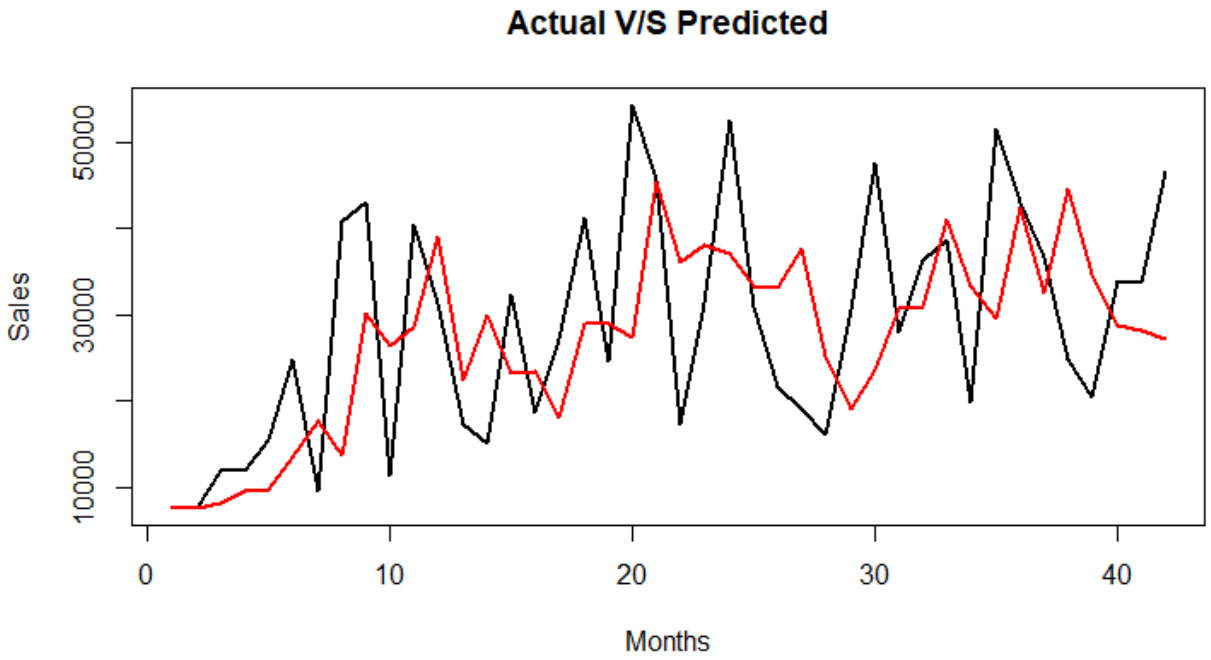


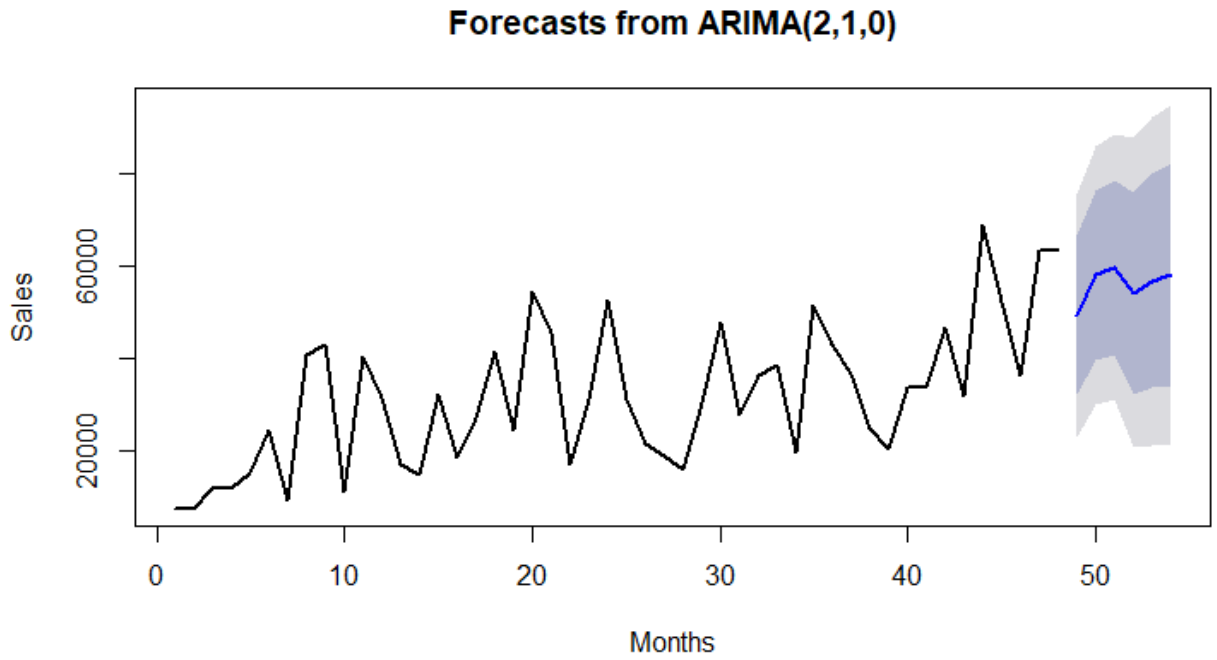


Auto ARIMA
Consumer EU Sales Forecast

- Auto ARIMA predicts a ARIMA (2,1,0) model.
- MAPE = 28.9226

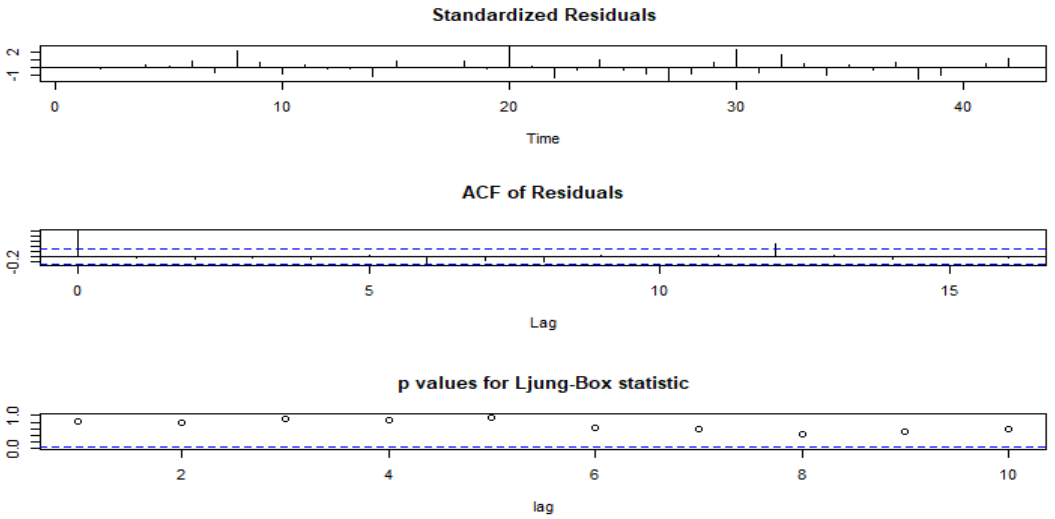


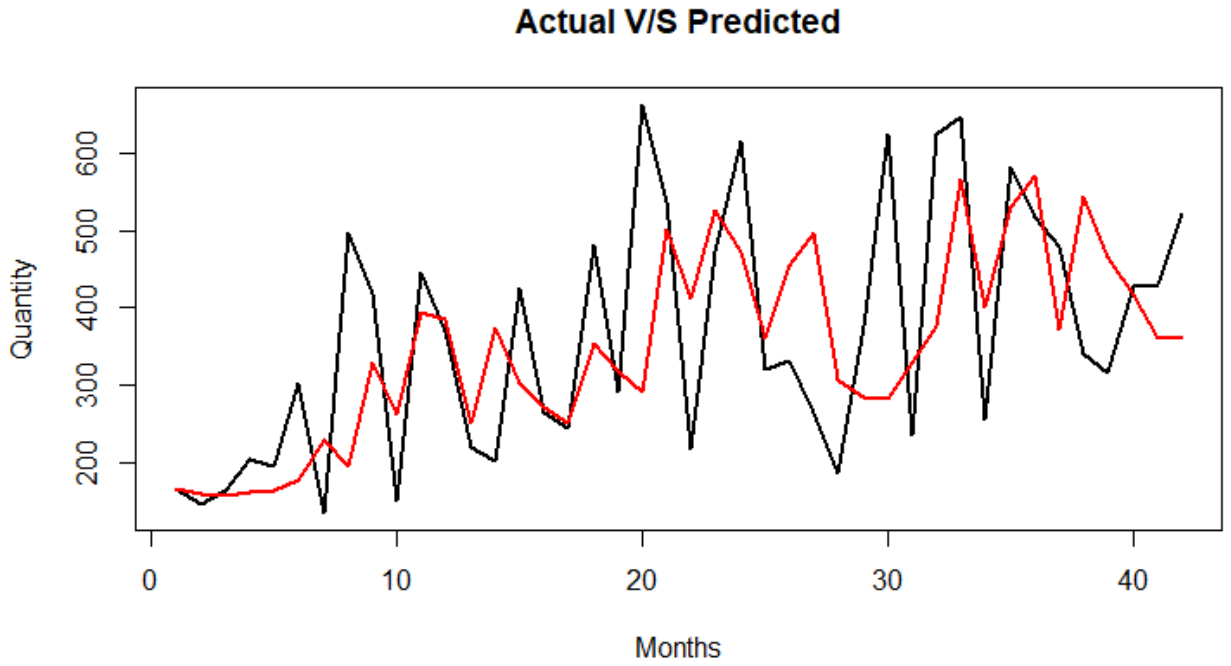


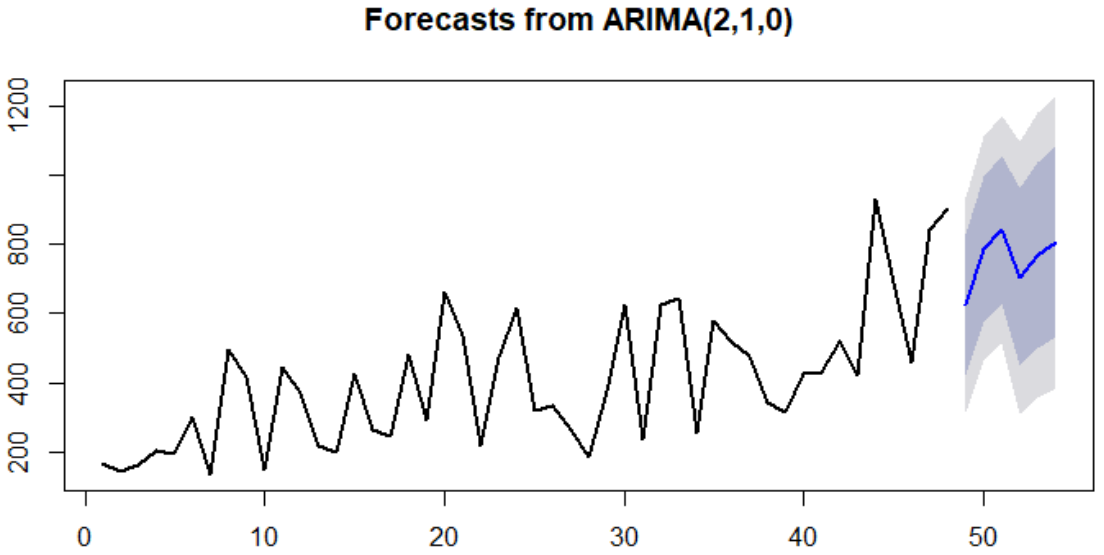


Auto ARIMA
Consumer EU Quantity Forecast

- Auto ARIMA predicts a ARIMA (2,1,0) model.
- MAPE = 30.13319

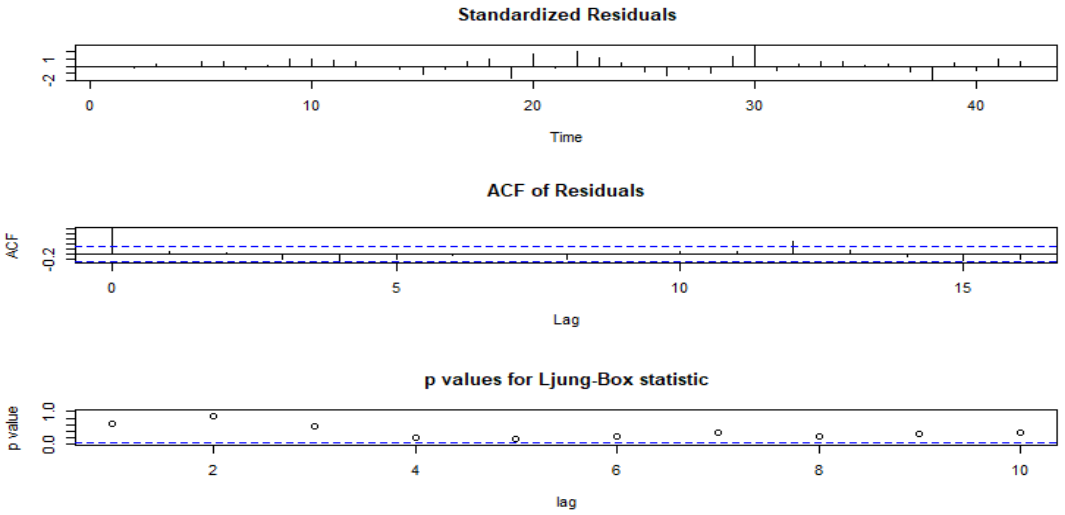


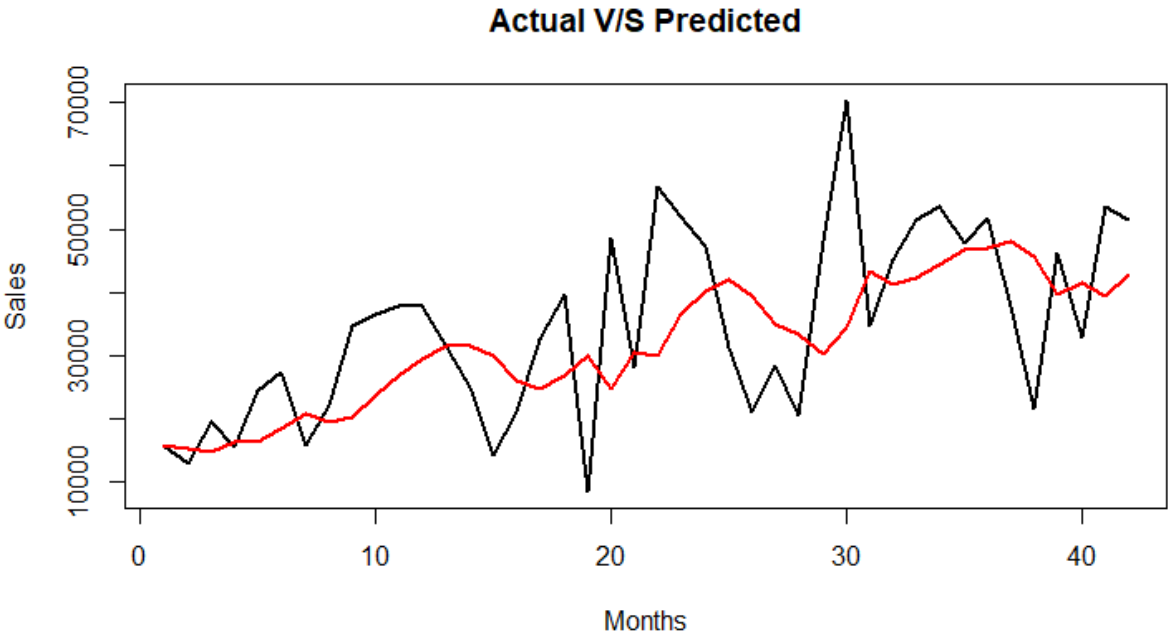


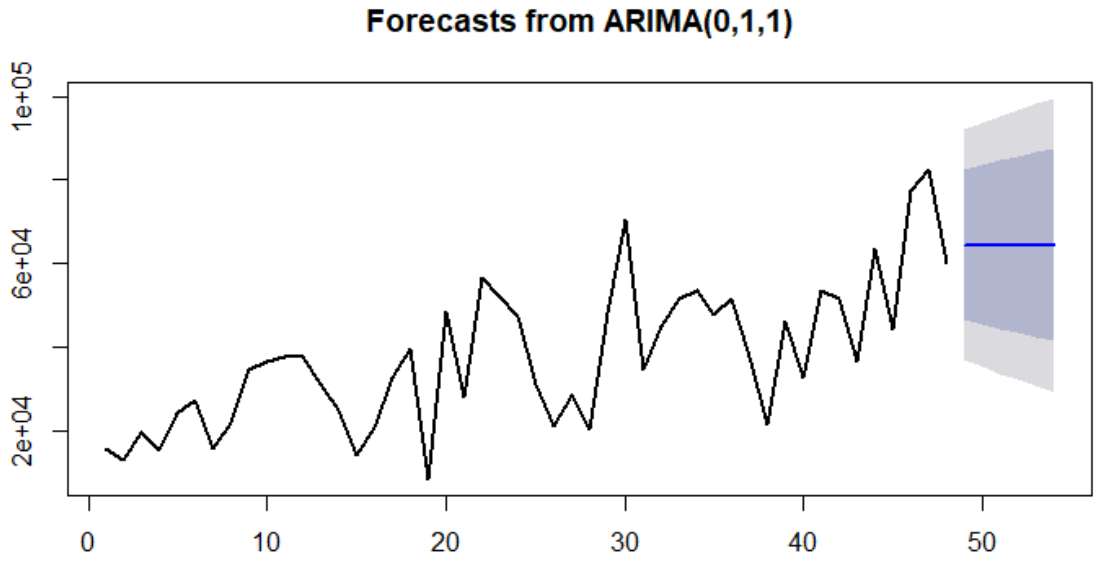


Auto ARIMA
Consumer APAC Sales Forecast

- Auto ARIMA predicts a ARIMA (0,1,1) model.
- MAPE = 27.68952

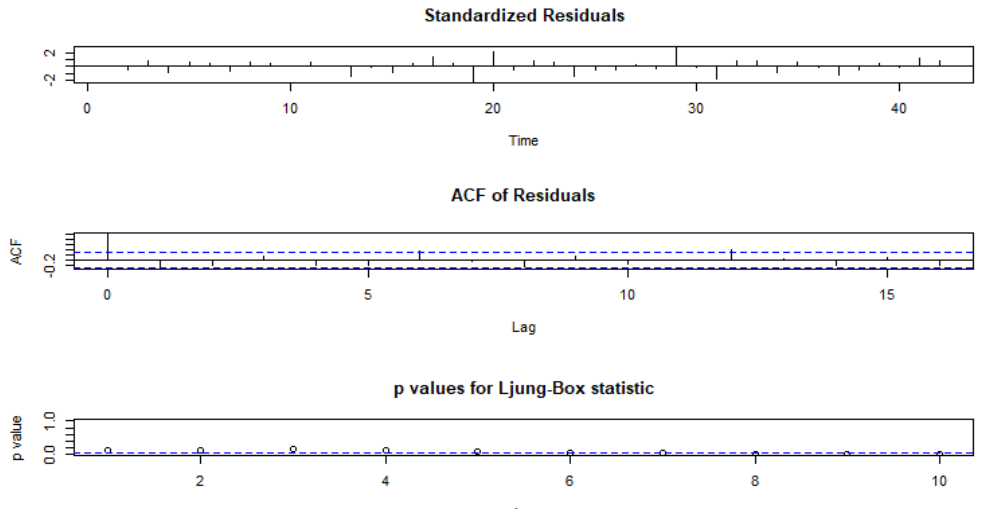


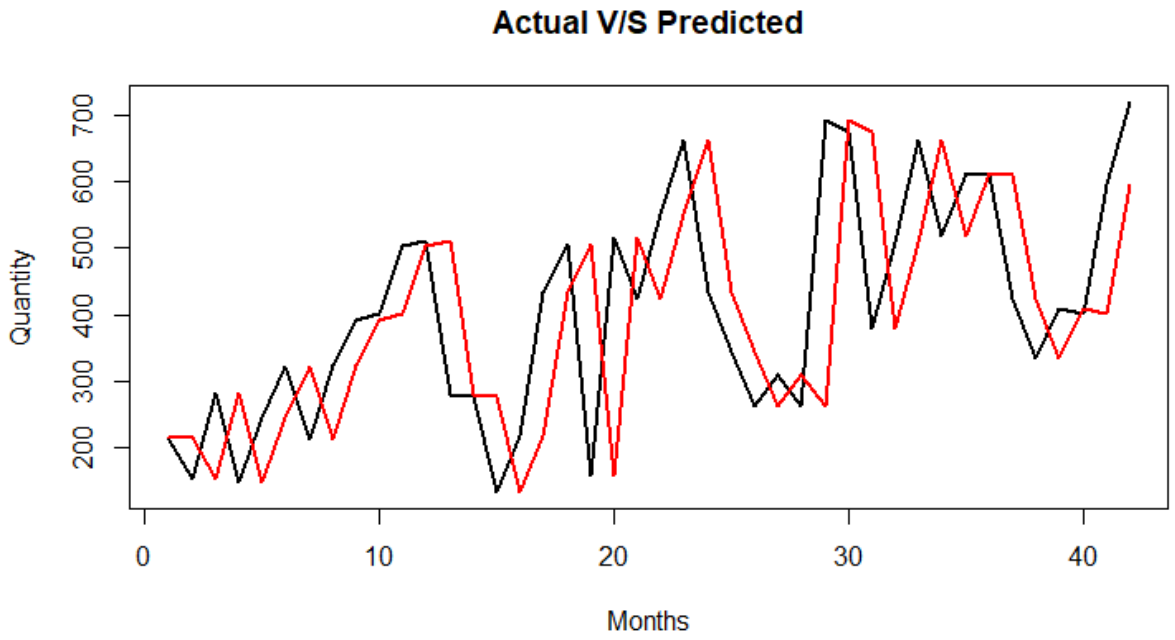


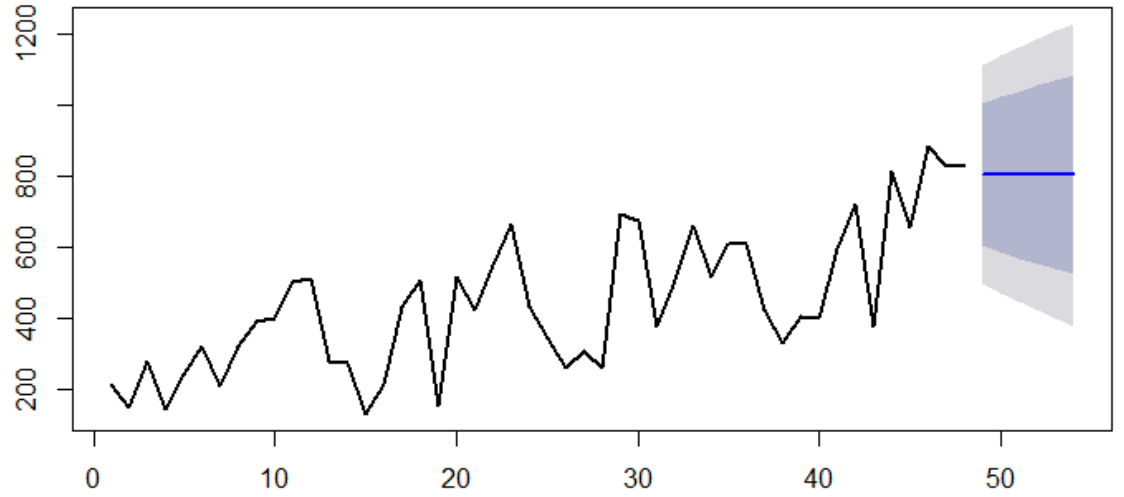


Auto ARIMA
Consumer APAC Quantity Forecast

- Auto ARIMA predicts a ARIMA (0,1,0) model.
- MAPE = 26.24458







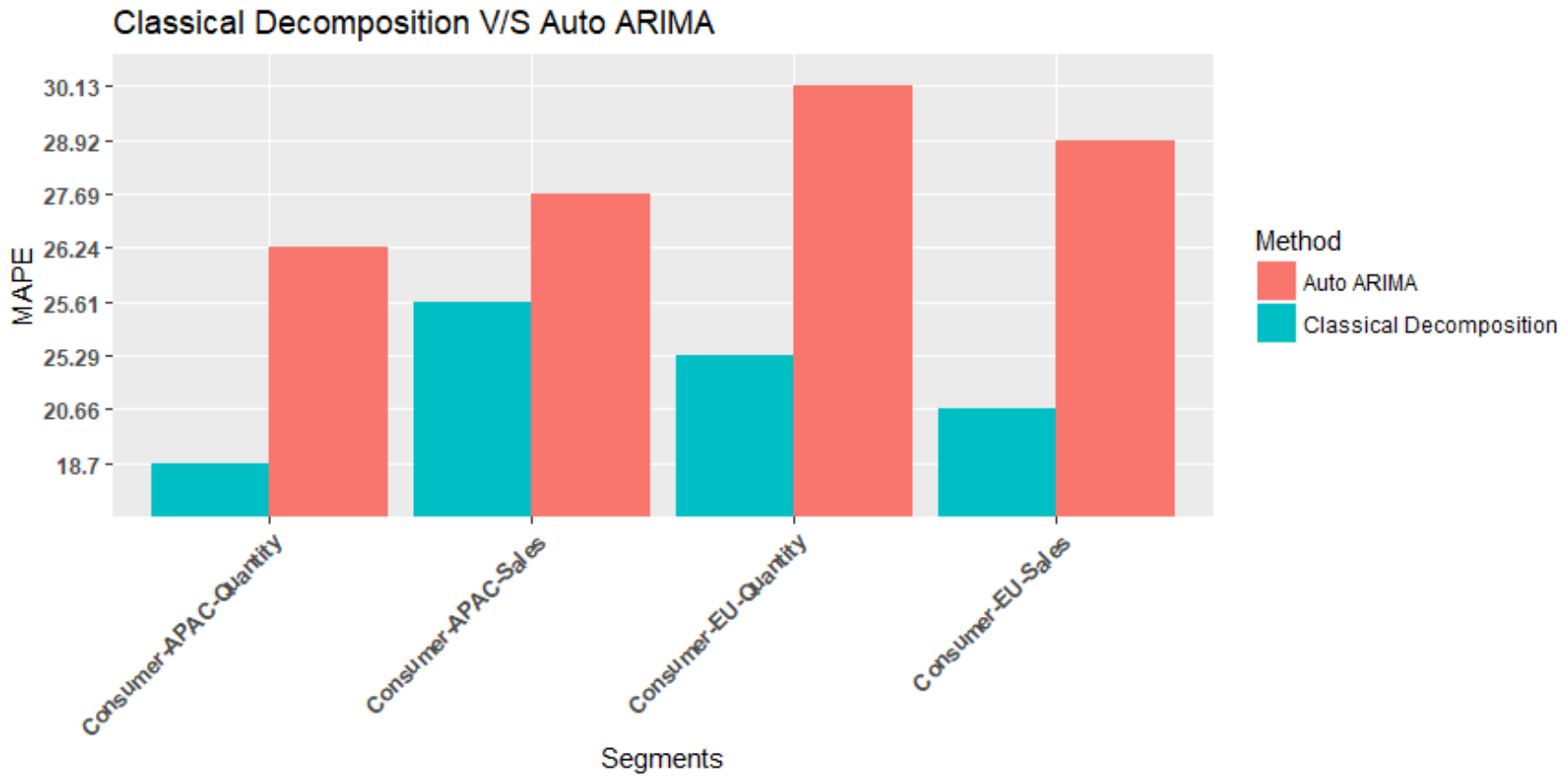
Future Forecast from Jan-2015 to June-2015

Month	Method	Consumer-EU-Sales	Consumer-EU-Quantity	Consumer-APAC-Sales	Consumer-APAC-Quantity
Jan-15	Classical Decomposition	62252.97	697.77	49717.10	766.45
Feb-15	Classical Decomposition	61033.13	635.00	44433.38	659.01
Mar-15	Classical Decomposition	59042.48	610.43	39283.80	575.44
Apr-15	Classical Decomposition	57575.83	659.55	37150.33	493.35
May-15	Classical Decomposition	58050.25	799.23	39718.73	414.26
June-15	Classical Decomposition	61598.35	1018.22	46435.21	424.94

Month	Method	Consumer-EU-Sales	Consumer-EU-Quantity	Consumer-APAC-Sales	Consumer-APAC-Quantity
Jan-15	Auto ARIMA	49358.71	626.20	64494.89	804.41
Feb-15	Auto ARIMA	58063.62	786.61	64494.89	804.41
Mar-15	Auto ARIMA	59714.33	842.92	64494.89	804.41
Apr-15	Auto ARIMA	54191.79	704.83	64494.89	804.41
May-15	Auto ARIMA	56811.55	768.63	64494.89	804.41
Jun-15	Auto ARIMA	58010.84	807.65	64494.89	804.41

Conclusion – 1
Evaluating Classical Decomposition Vs Auto ARIMA

In all cases classical decomposition shows a better accuracy as compared to Auto ARIMA process.



Conclusion – 2
Predictions Classical Decomposition Vs Auto ARIMA

Below is the comparison of predictions made by classical decomposition and Auto ARIMA.