

Retail-Giant Sales Forecasting Case Study

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About Global Mart:

“Global Mart” is a online store super giant having worldwide operations. It provides wide range of products to various countries and the major product categories include Consumer, Corporate and Home Office.

Business Objective :

The objective is to forecast the sales and demand of Global Mart for the next 6 months based on the analysis of the available data.

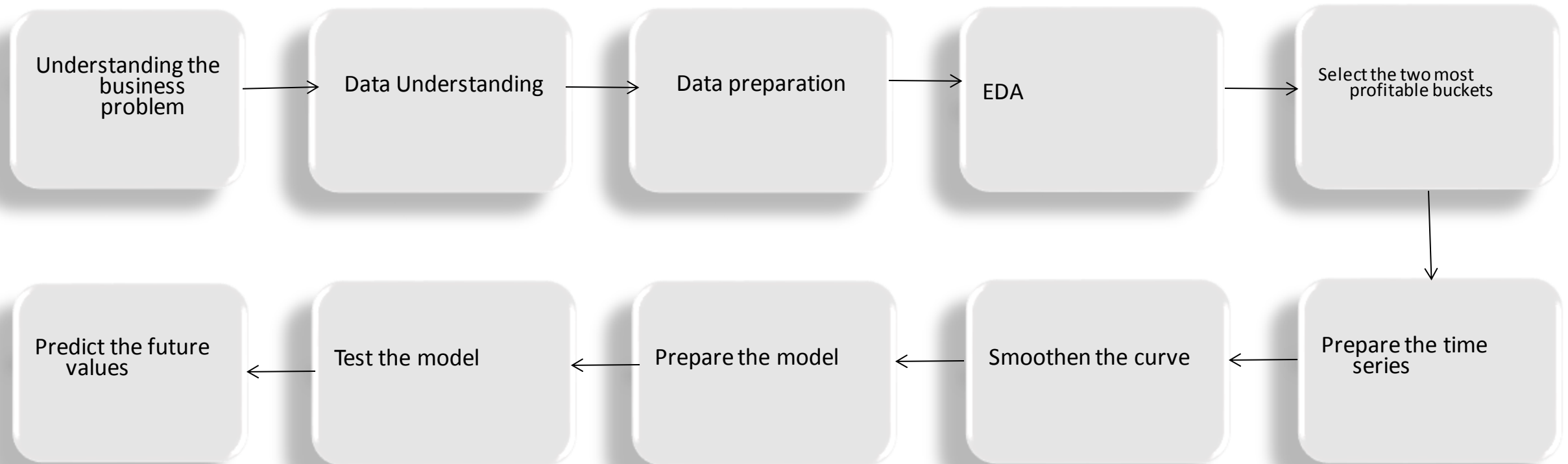
Strategy :

We use the time series analysis for the business forecasting.

The data consists of 24 attributes related to each transaction which include market segment and categories along with other attributes. There are 7 different market segments (APAC, EU, EMEA , LATAM ,US ,Africa , Canada) and 3 major Categories(Consumer, Corporate and Home Office).For our analysis we consider only market segments and the above mentioned categories ; so in total we subset the data into 21 buckets.

Now out of these 21 buckets we select the 2 most profitable and consistent buckets and forecast the sales and demand for these segments.

Problem Solving Methodology



Data Preparation

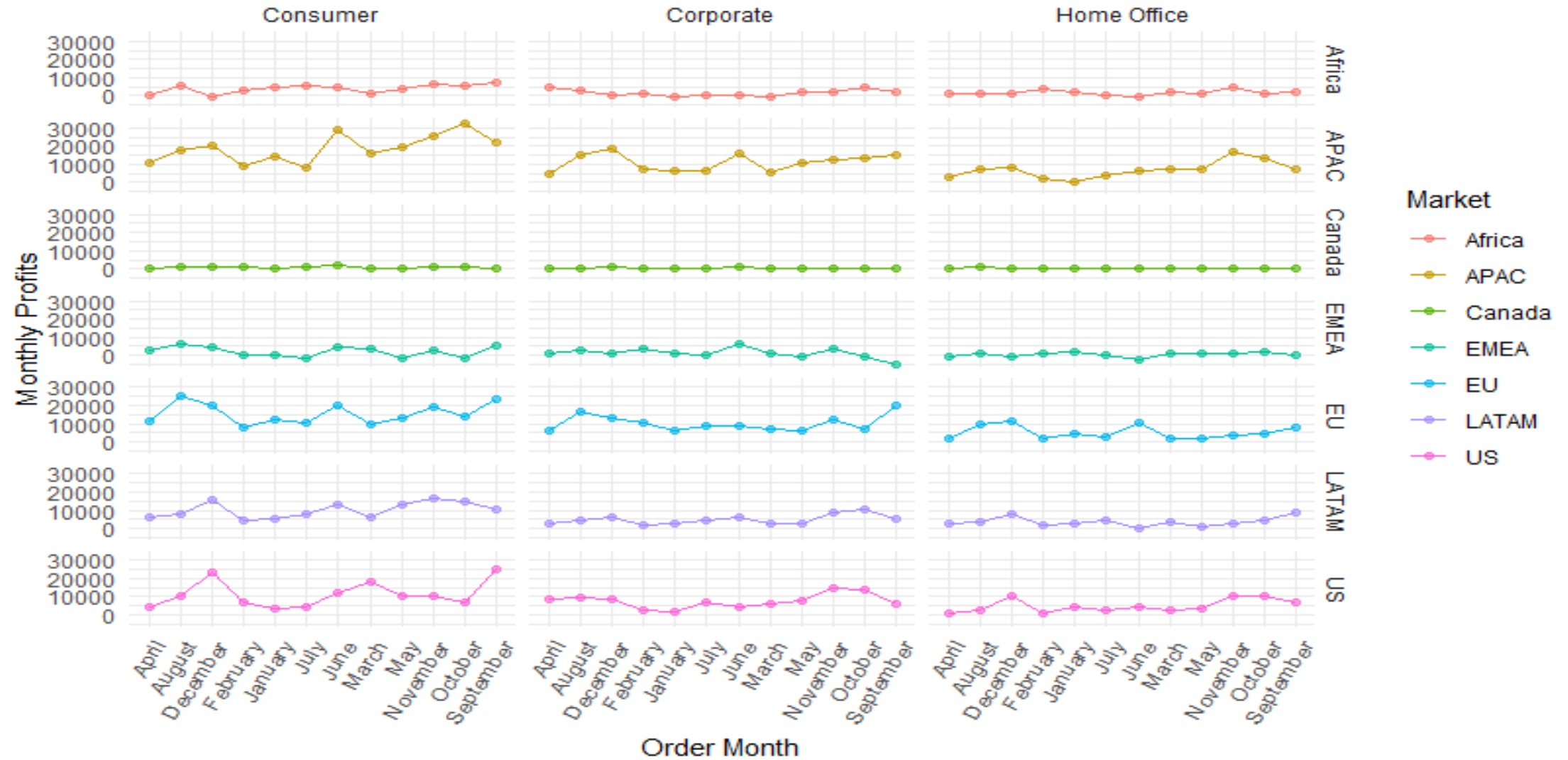
Below are the steps we followed to clean the data:

- Fix missing values/Rows and columns
 - Check for NA values
 - Remove unnecessary columns which are not required for our analysis.

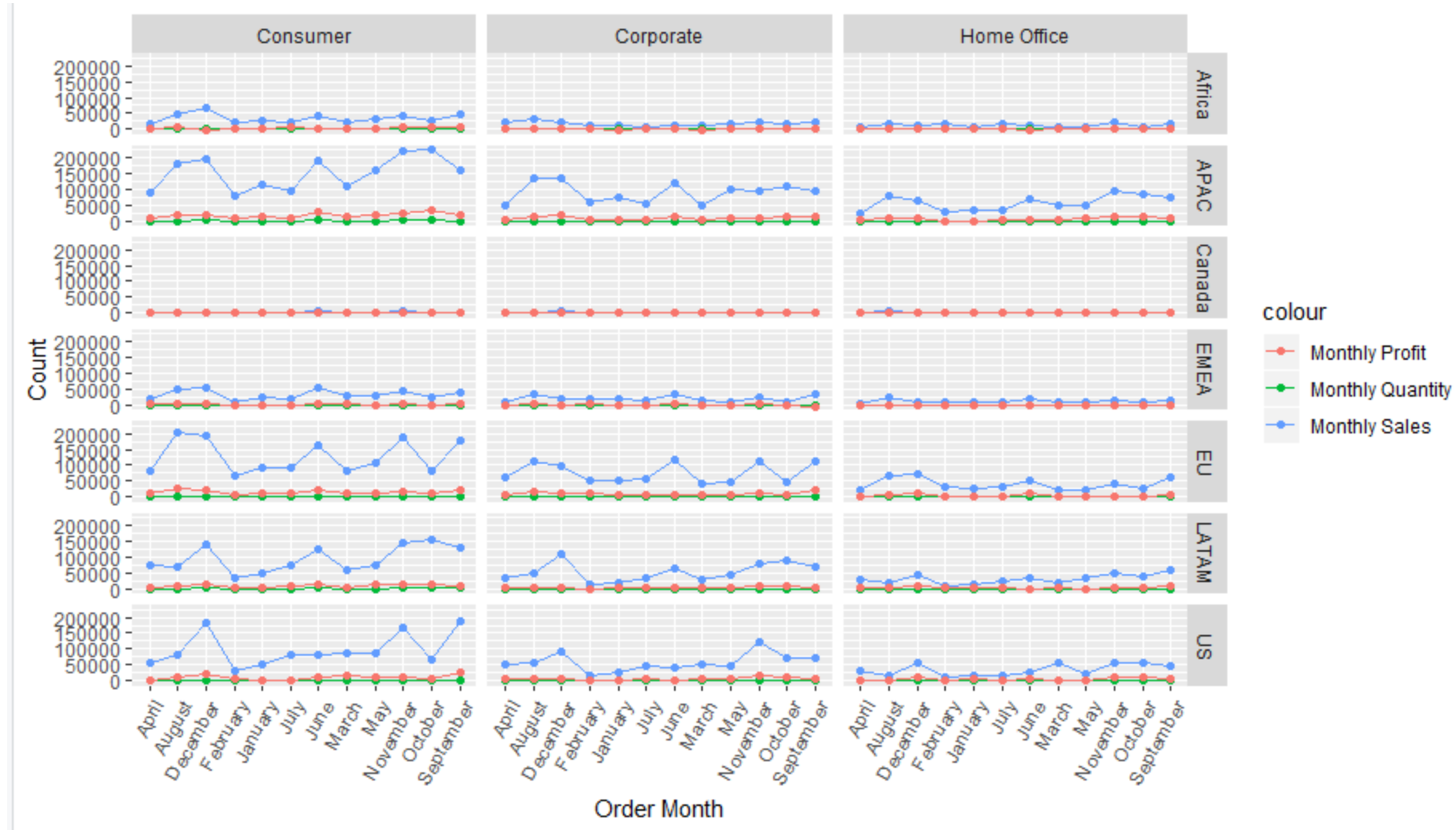
- Check for duplicates rows

- Standardise values
 - Convert date to standard format

Market and segment wise Monthly Profit



Aggregated monthly profit, quantity and sales



Coefficient of Variation of monthly sales

Top 5 Buckets of Market and Segments

Market	Segment	Monthly_Profit.Mean	SD.Profit	CV.Profit
EU	Consumer	15723.9756	5680.2012	0.3612446
APAC	Consumer	18568.1300	7745.3247	0.4171300
LATAM	Consumer	10052.7443	4291.5324	0.4269016
APAC	Corporate	10811.4362	4709.1430	0.4355705
EU	Corporate	10282.8316	4535.0059	0.4410270

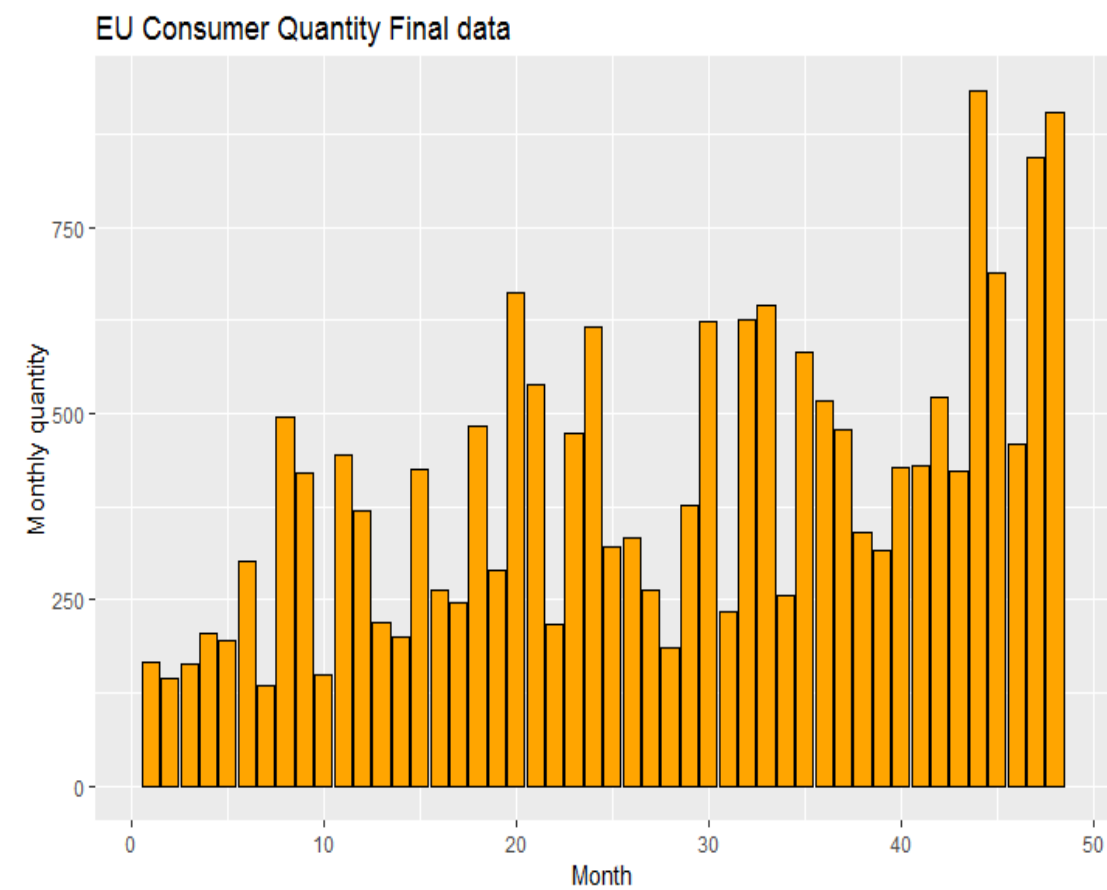
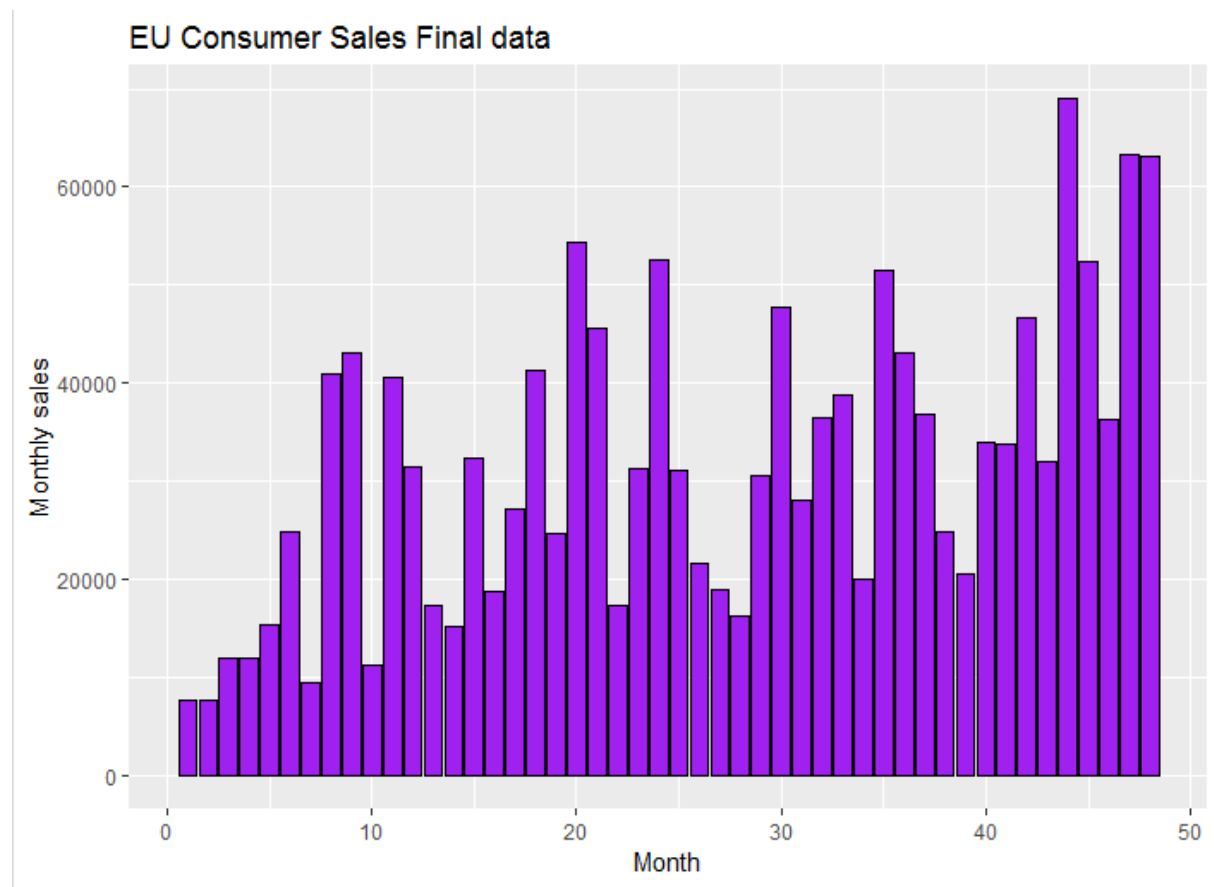
Selection of two most profitable buckets

- ❑ After the analysis and based on the values of the coefficient of variation of the monthly sales the two most profitable buckets (market and segments) are as follows

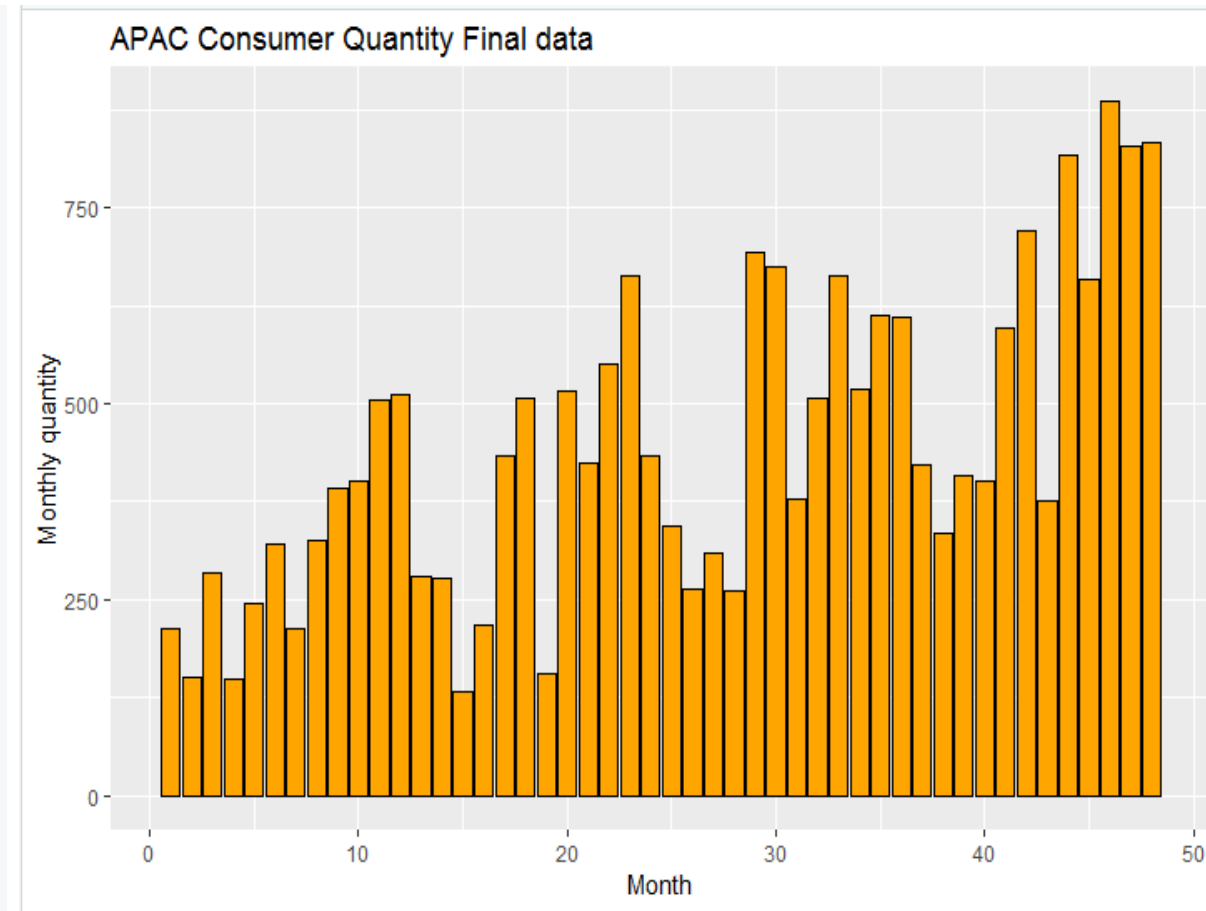
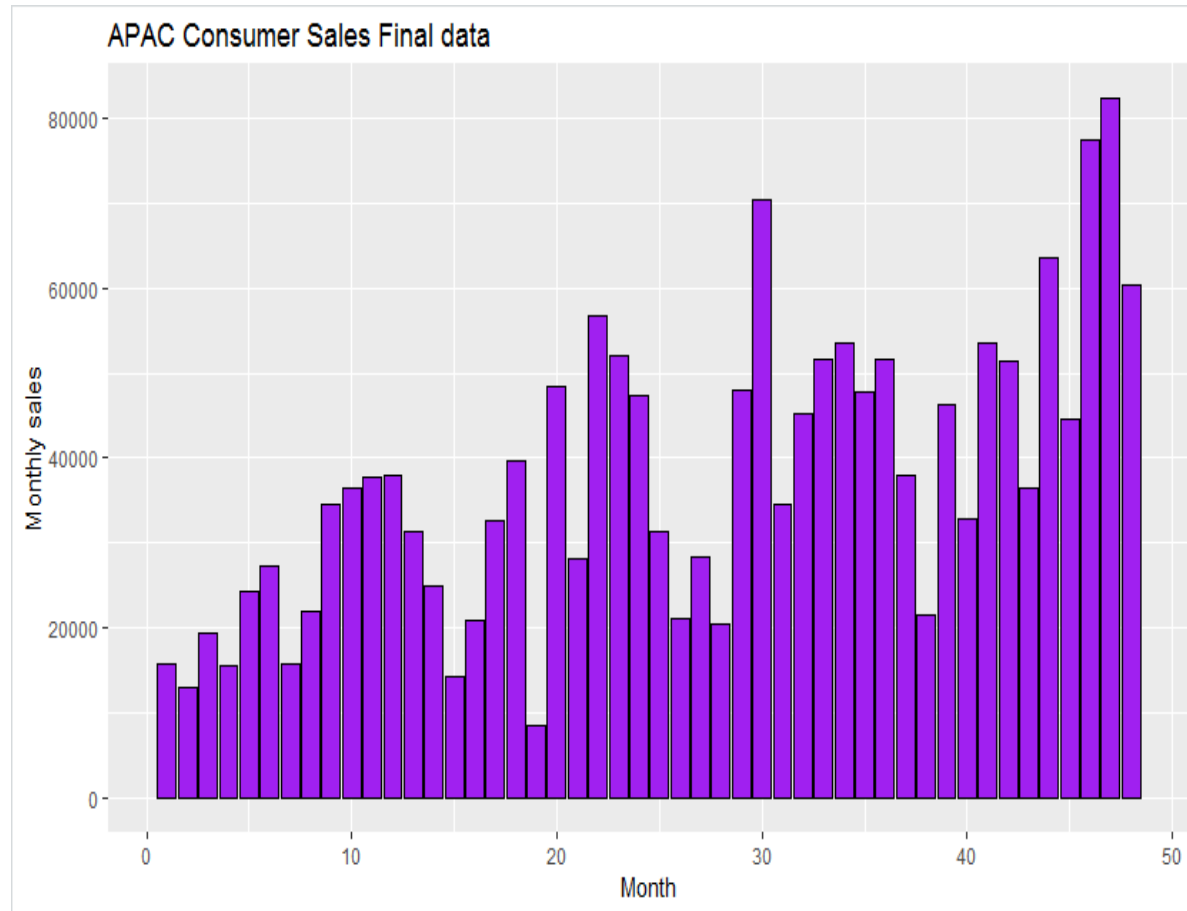
Market	Segment
EU	Consumer
APAC	Consumer

- ❑ We consider EU Consumer and APAC Consumer for further analysis

EU Consumer Data distribution

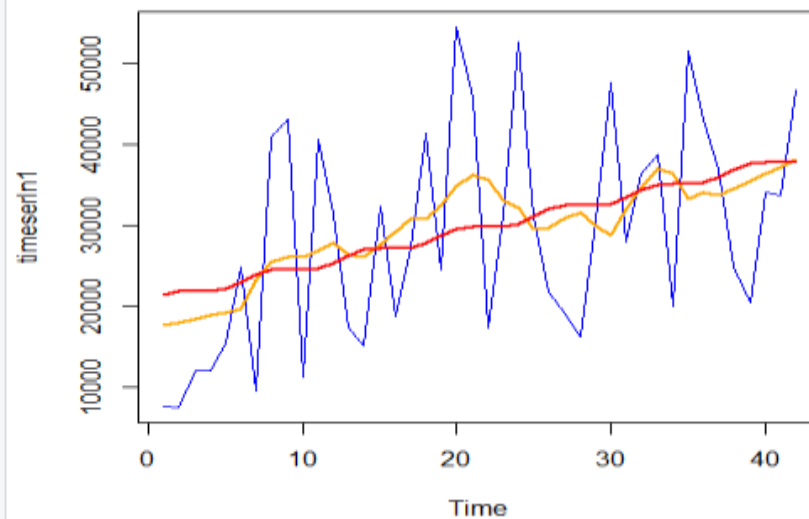


APAC Consumer Data distribution

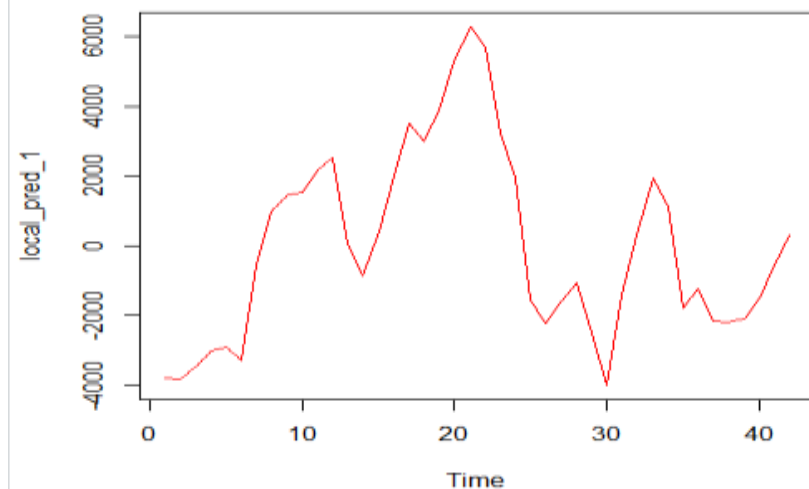


EU Consumer Sales

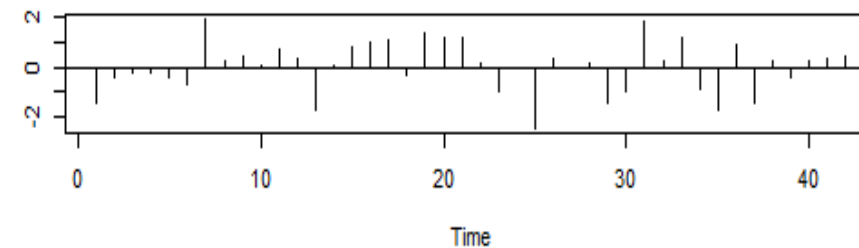
Time series - Blue
Smoothed curve - Orange
Global prediction - Red



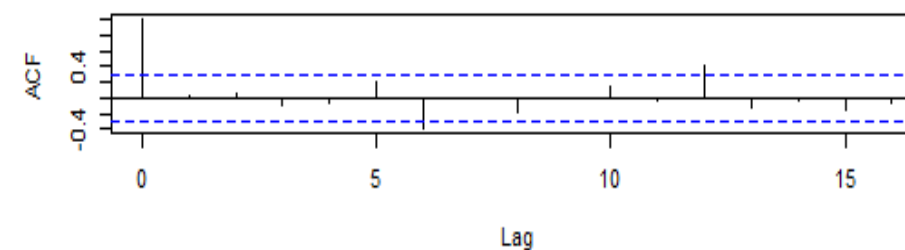
Local prediction



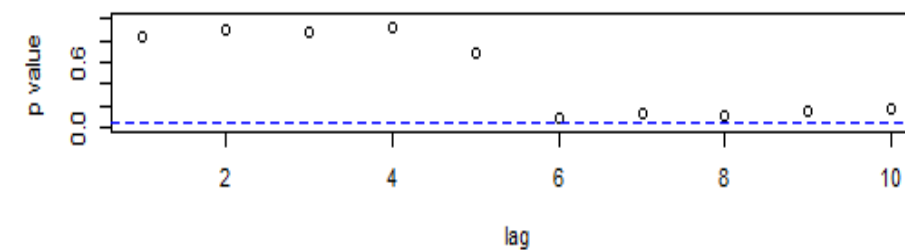
Standardized Residuals



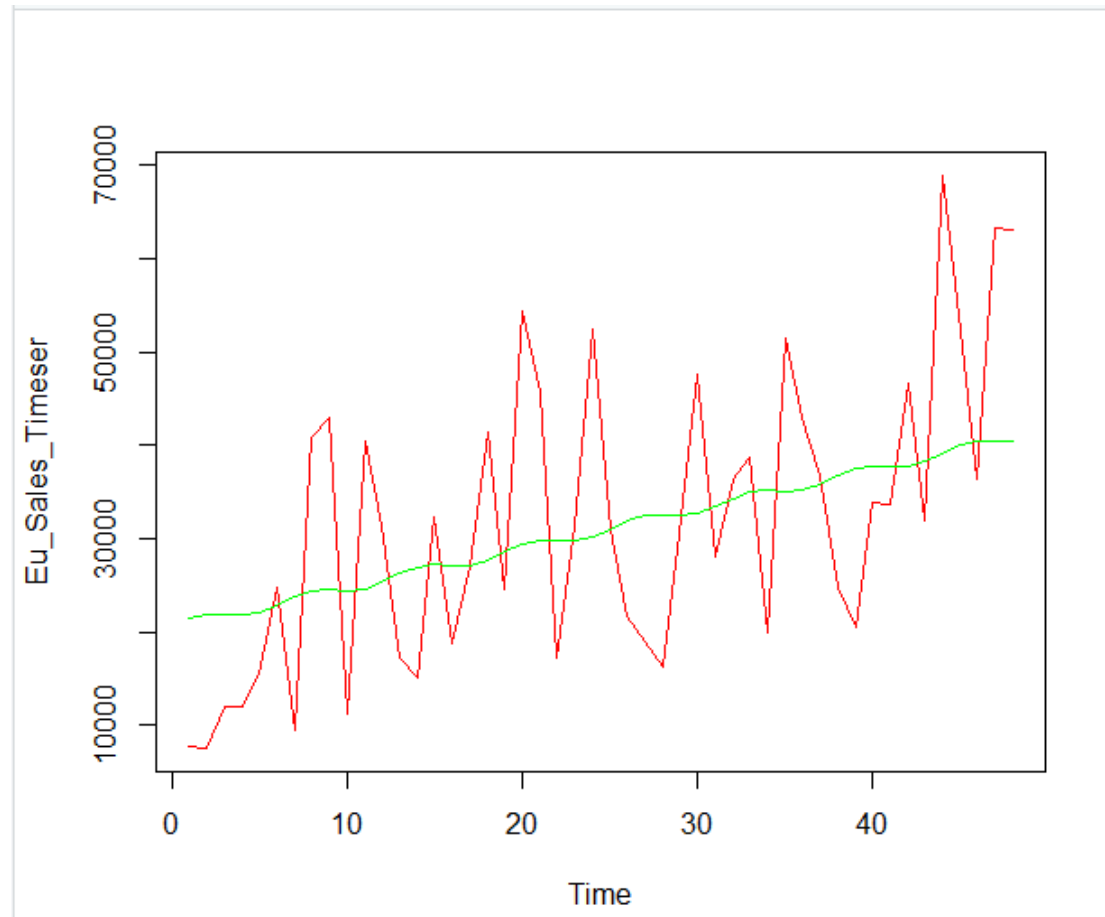
ACF of Residuals



p values for Ljung-Box statistic



EU Consumer Sales



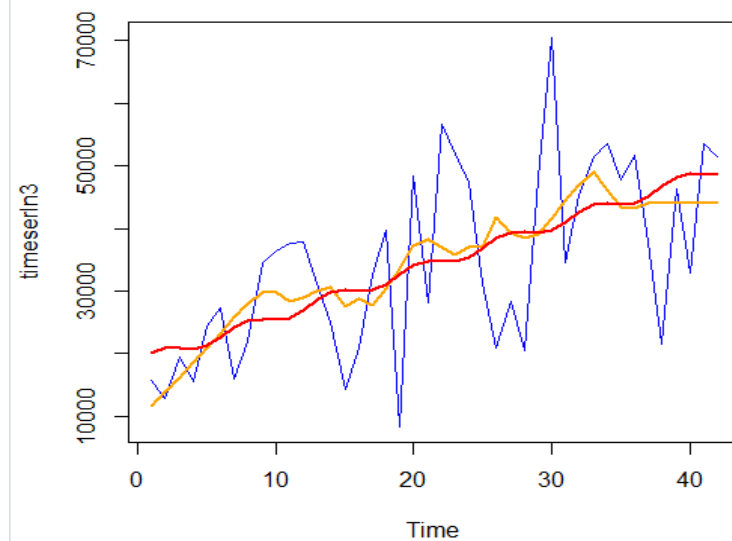
EU Consumer Sales time series- Red
Prediction - Green

Observations from the prediction for the next six months

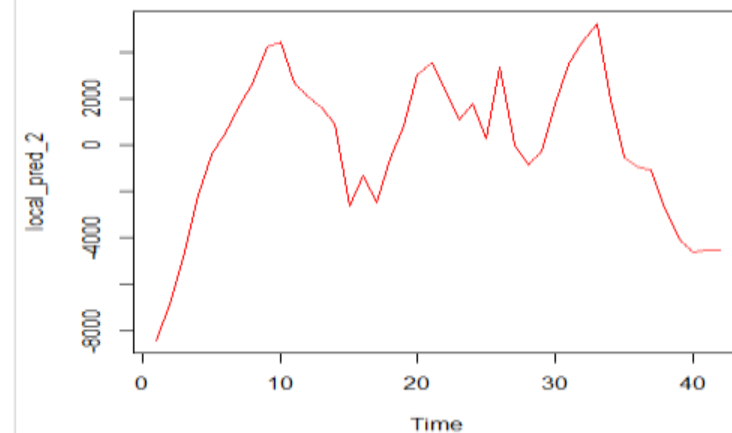
As per the prediction in the next six months the EU consumer sales will remain steady in the beginning trend with a small increase towards the end

APAC Consumer Sales

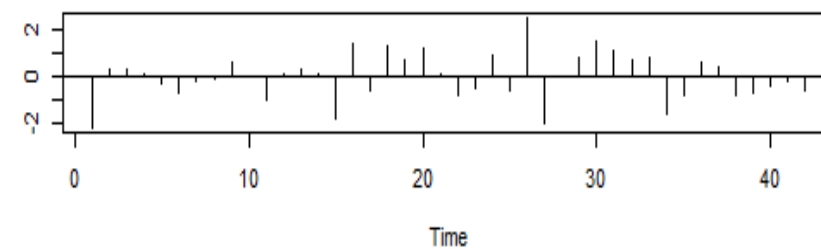
Time series -Blue
Smoothed curve - Orange
Global prediction - Red



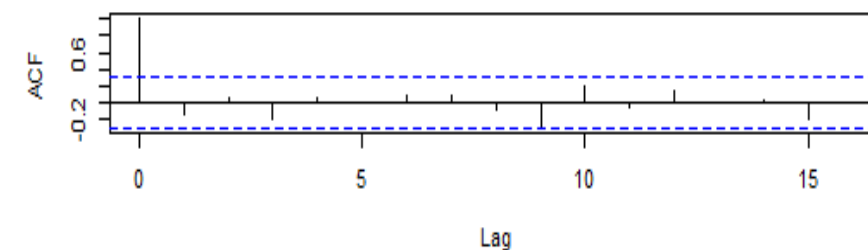
Local prediction



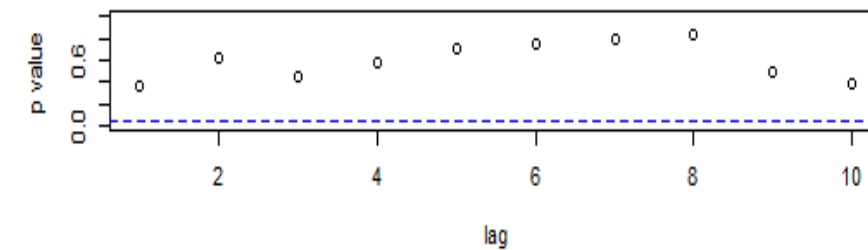
Standardized Residuals



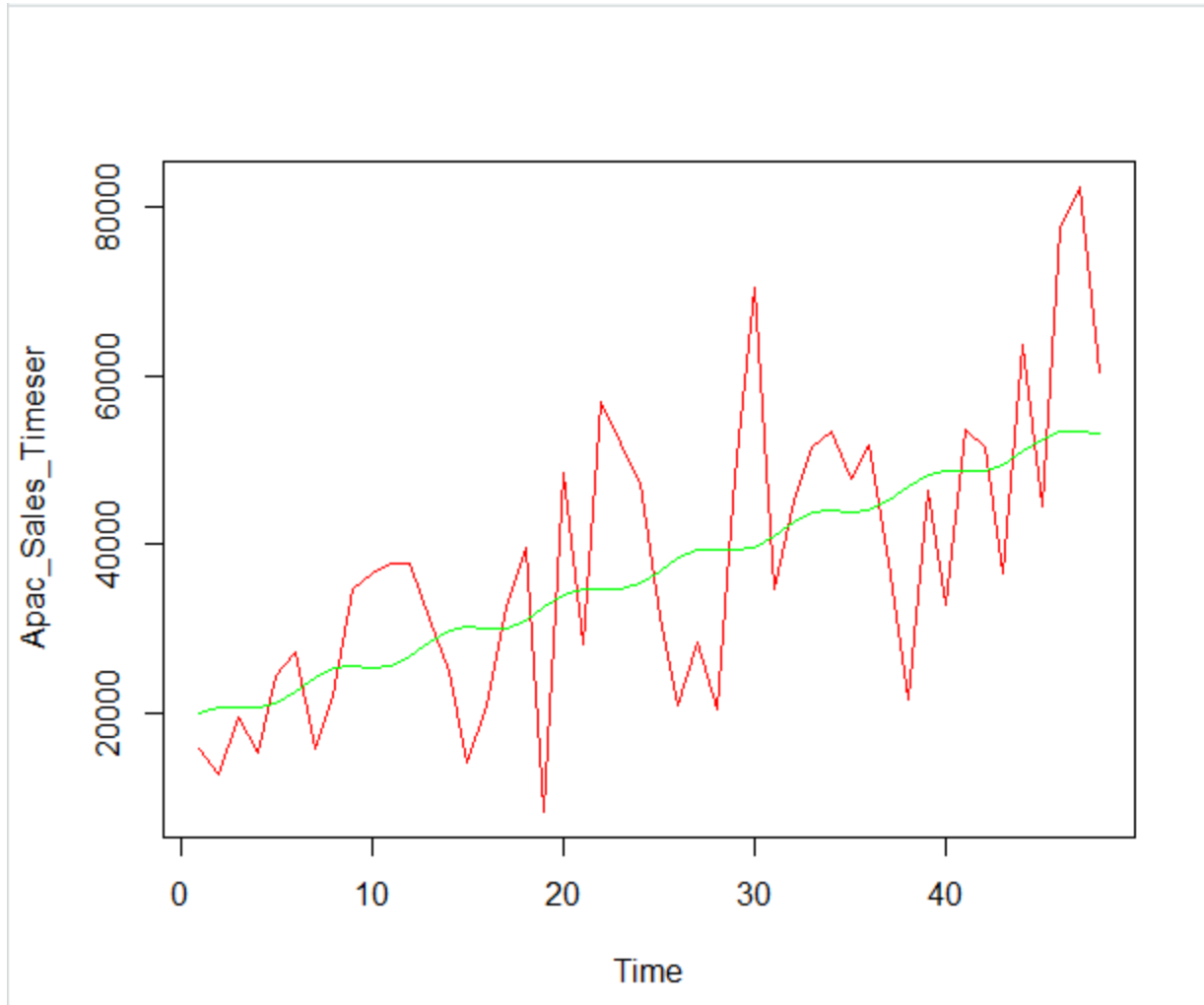
ACF of Residuals



p values for Ljung-Box statistic



APAC Consumer Sales



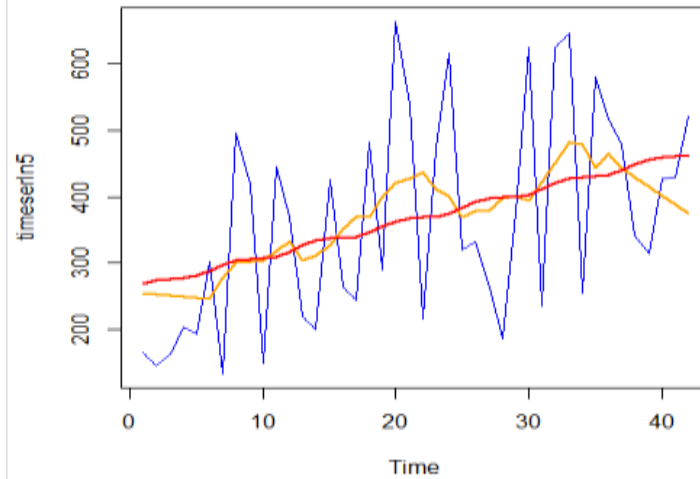
APAC Consumer Sales time series- Red
Prediction- Green

Observations from the prediction for the next six months

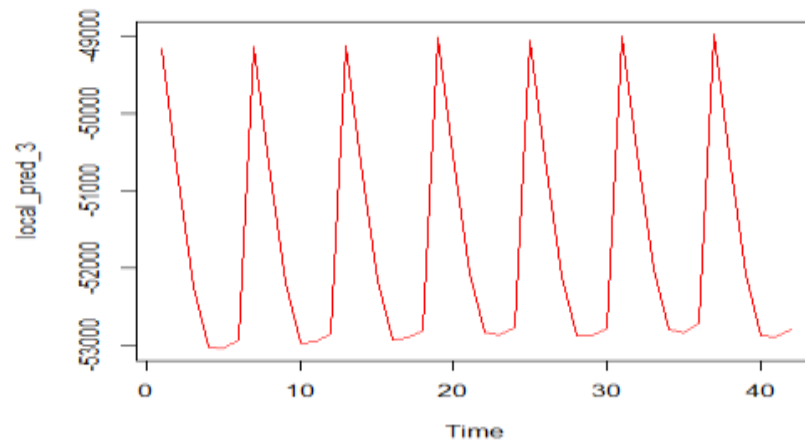
As per the prediction in the next six months the APAC consumer sales will have a small dip in between and then rise again towards the end

EU Consumer Quantity

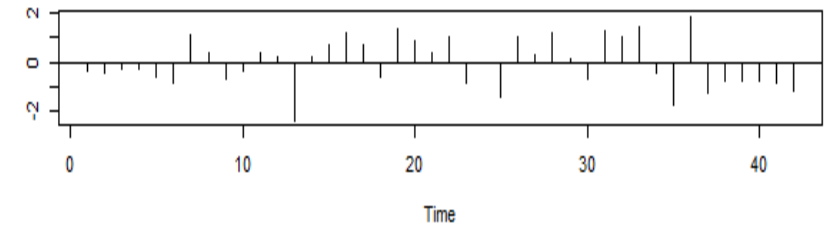
Time series -Blue
Smoothed curve - Orange
Global prediction - Red



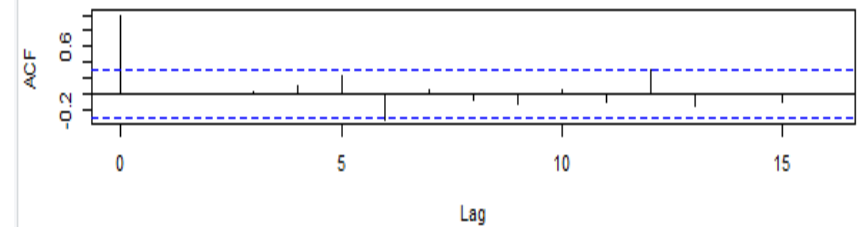
Local prediction



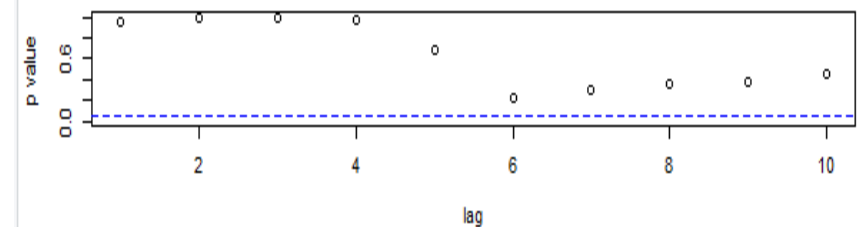
Standardized Residuals



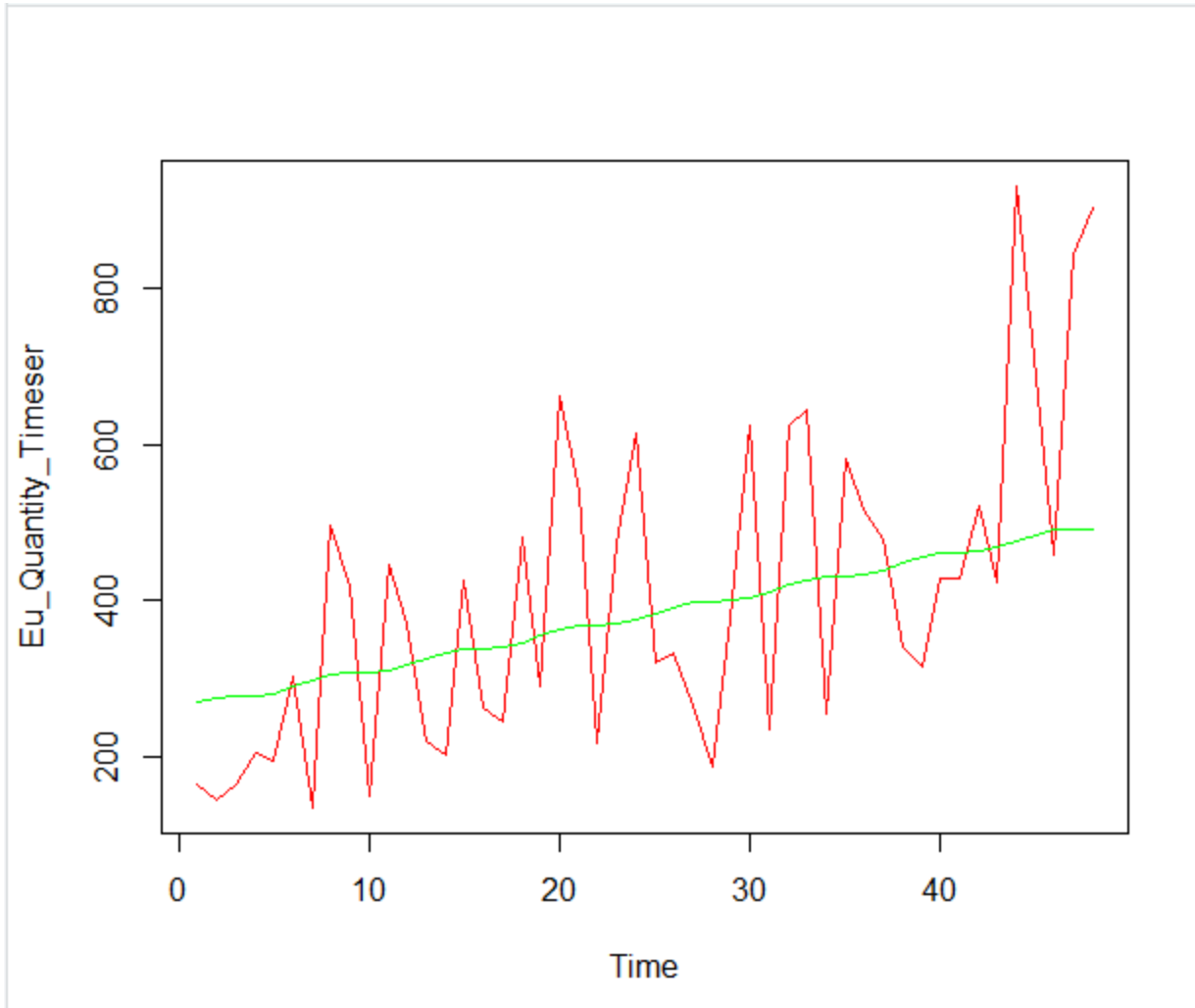
ACF of Residuals



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EU Consumer Quantity



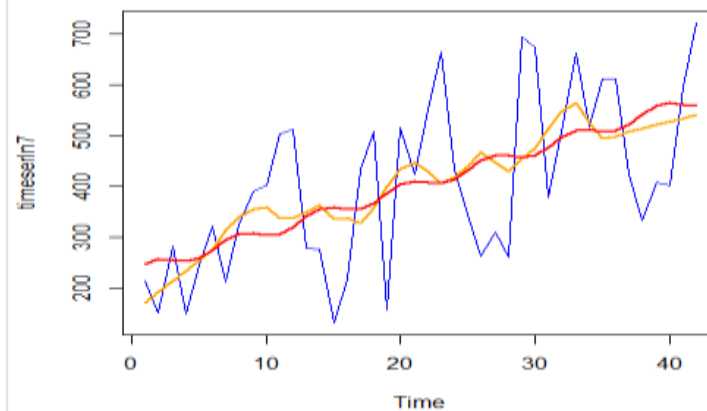
EU Consumer Quantity time series- Red
Prediction - Green

Observations from the prediction for the next six months

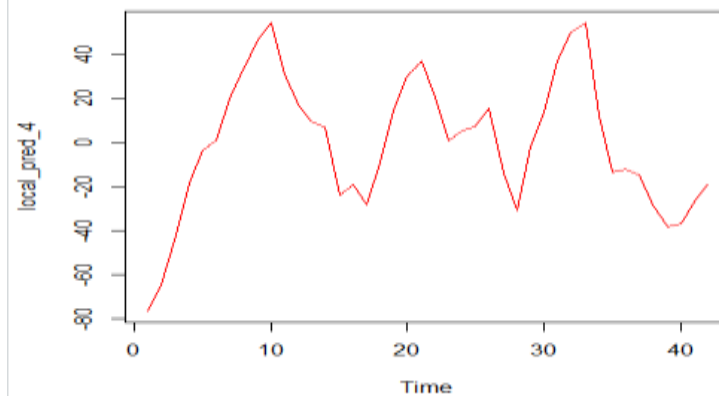
As per the prediction in the next six months the EU consumer quantity will be almost steady with only slight increase towards the end

APAC Consumer Quantity

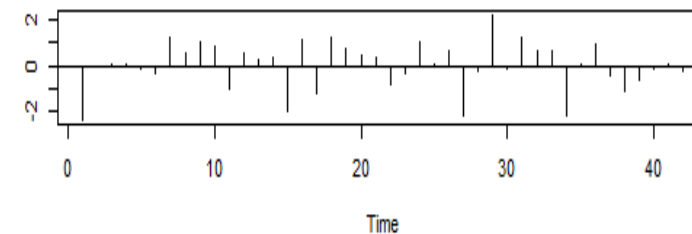
Time series -Blue
Smoothed curve - Orange
Global prediction - Red



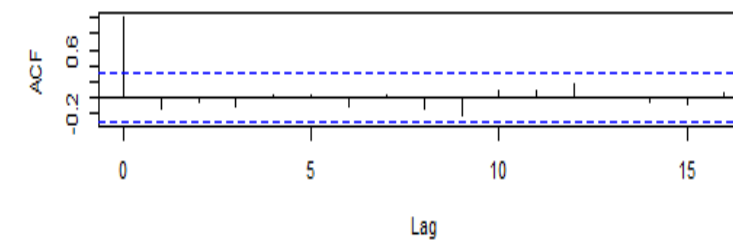
Local prediction



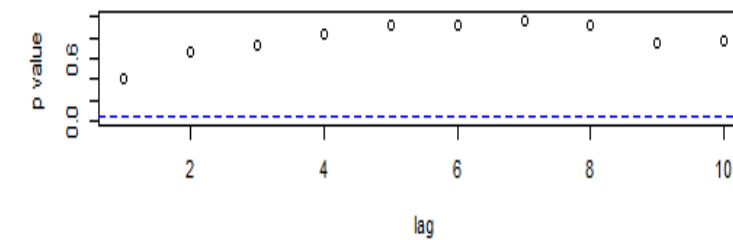
Standardized Residuals



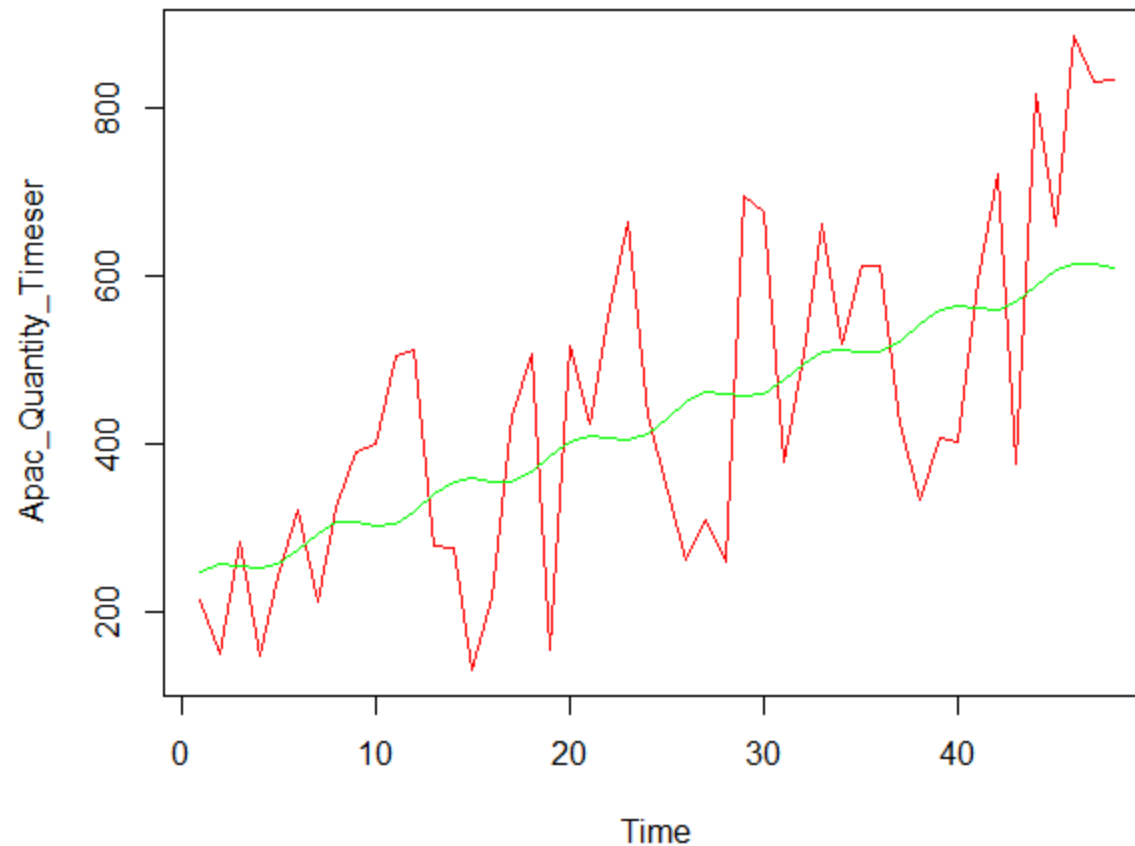
ACF of Residuals



p values for Ljung-Box statistic



APAC Consumer Quantity



APAC Consumer Quantity time series -
Red
Prediction - Green

Observations from the prediction for the next six months

As per the prediction in the next six months the APAC consumer quantity will have a slight rise in the beginning and then have a considerable dip and then again a rise towards the end

Conclusions and Recommendations

- ❖ The EU Consumer Sales, APAC Consumer Sales and EU Consumer Quantity show almost an increasing trend with only slight dip .
- ❖ The APAC Quantity comparatively shows considerable dip during the 6 month period.
- ❖ For a better revenue we would recommend to increase the quantity of Consumer products in APAC region .This will ensure there is no significant dip in the quantity of Consumer products for various countries APAC region.
- ❖ Also in the region of EU for sales and quantity of Consumer products and for sales of Consumer products in the APAC region appropriate measures must be taken to ensure there is no slight dip in the respective aspects.