

TIME-SERIES CASE STUDY

SUBMISSION

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Business Problem

Business Understanding:

- Global Mart is an online store with worldwide operations.
- It deals with all the major product categories -consumer, corporate & home office.
- The store caters to 7 different market segments and in 3 major categories.

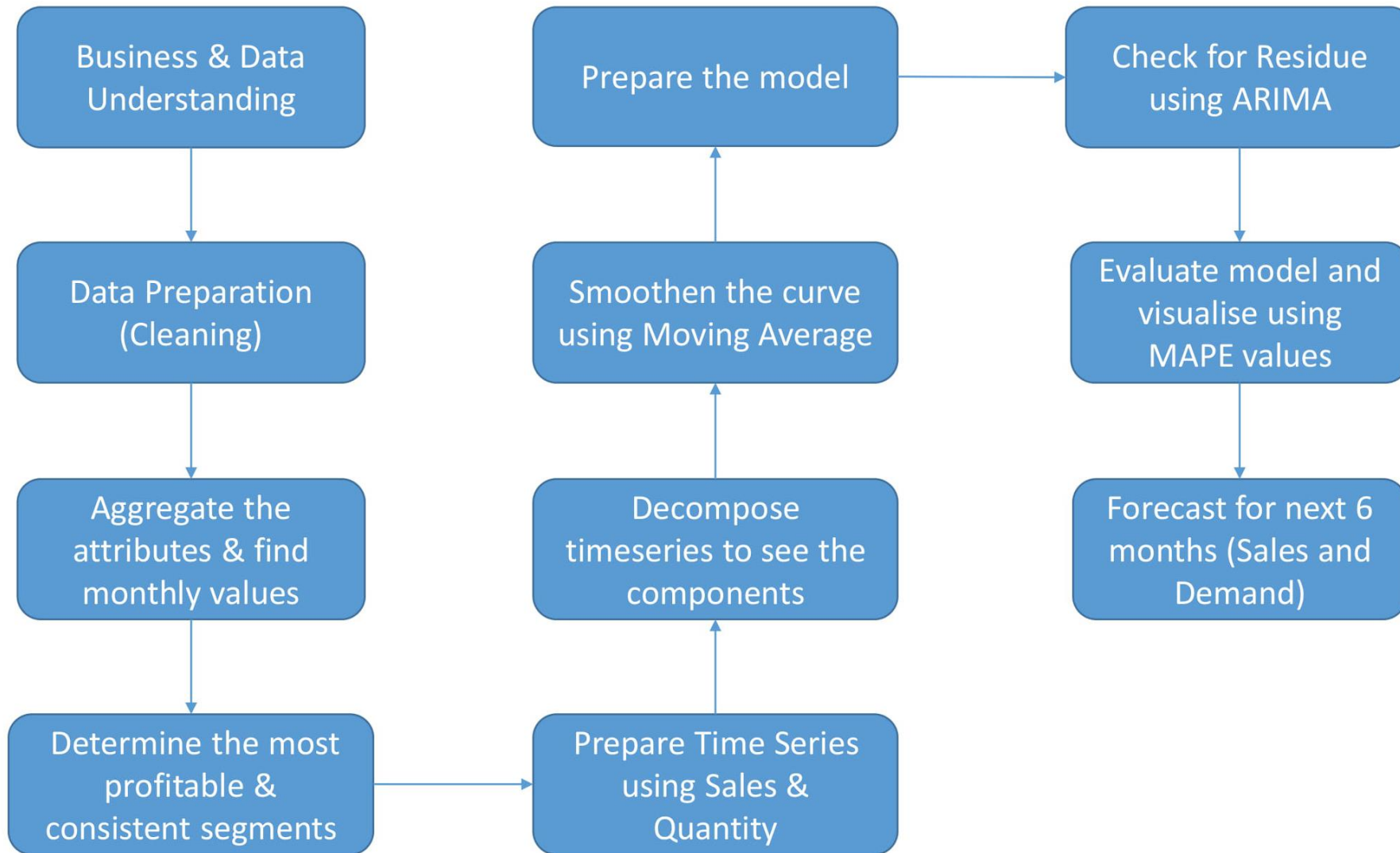
Goal:

To Forecast Sales and Demand For Next 6 Months which would help us manage the revenue and inventory accordingly

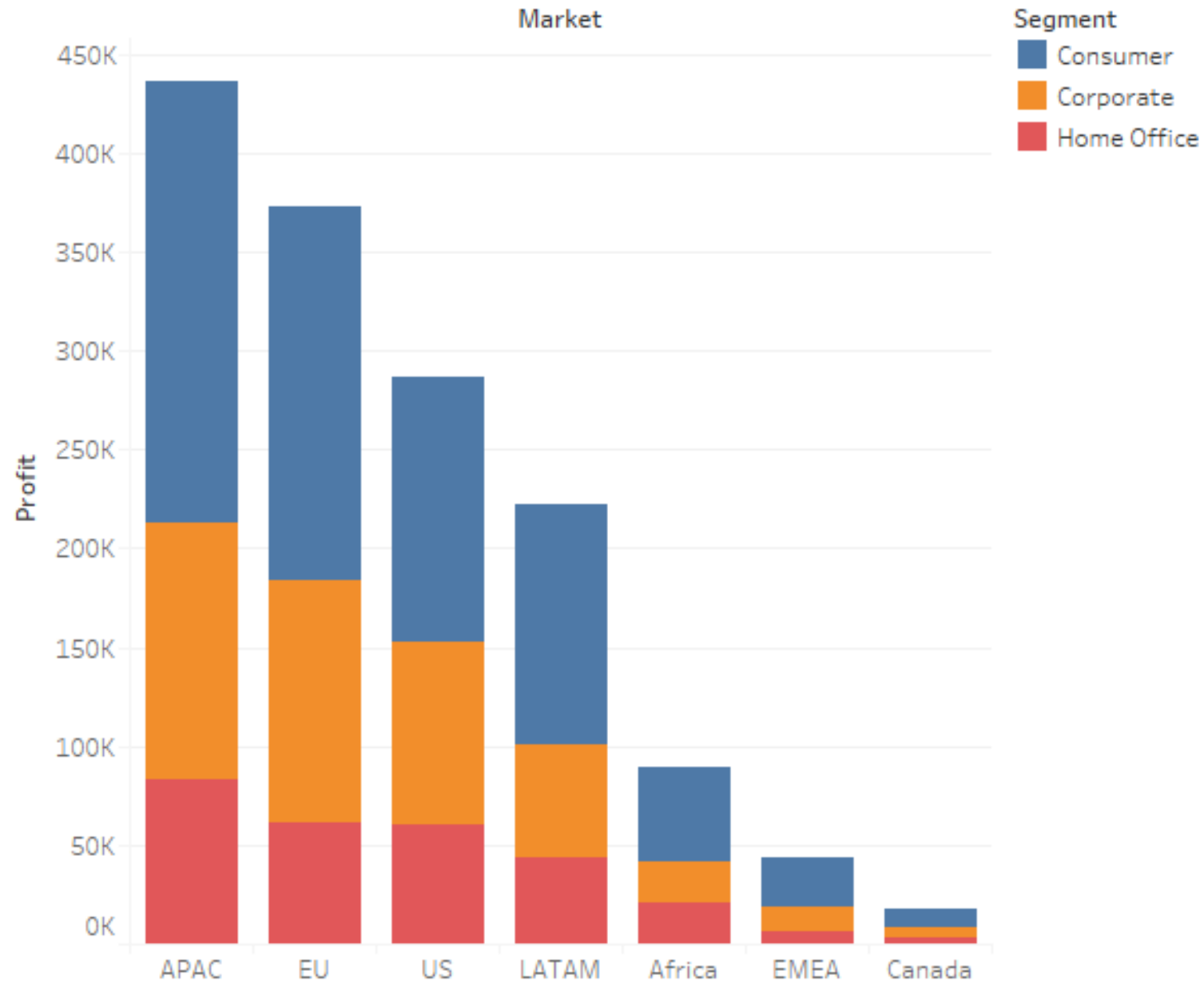
Data Understanding:

- The data currently has the transaction level data, where each row represents a particular order made on the online store.
- There are 24 attributes, out of which Market, Segment, Quantity, Sales and Profit are of our interest.
- We will subset the data into 21 ($7*3$) buckets before analyzing.
- We will find out 2 most profitable (and consistent) segment from these 21 and forecast the sales and demand for these segments.

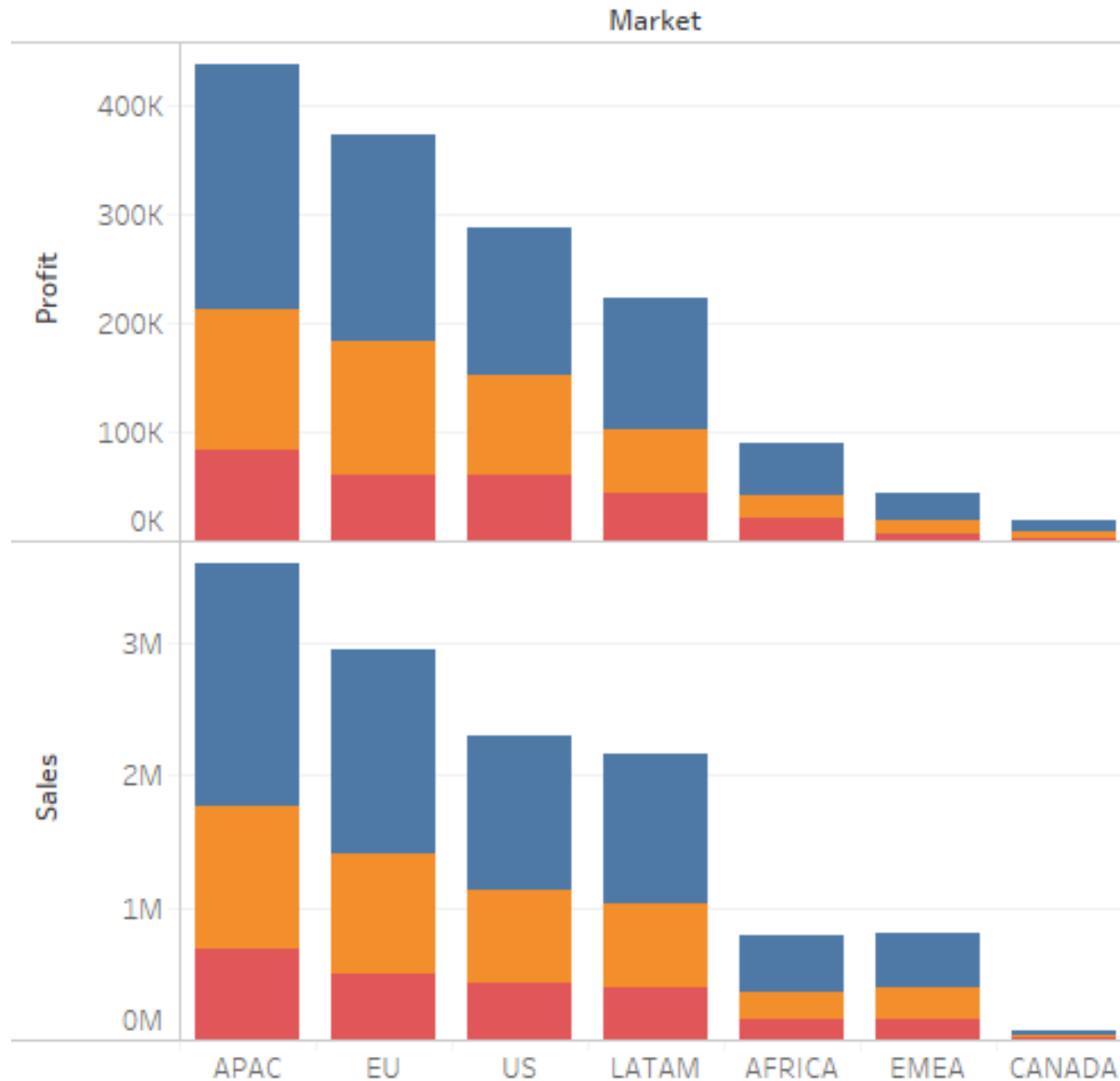
Problem Solving Methodology



Total profit graph for Market-Segment



Sum of Profit for each Market. Color shows details about Segment.



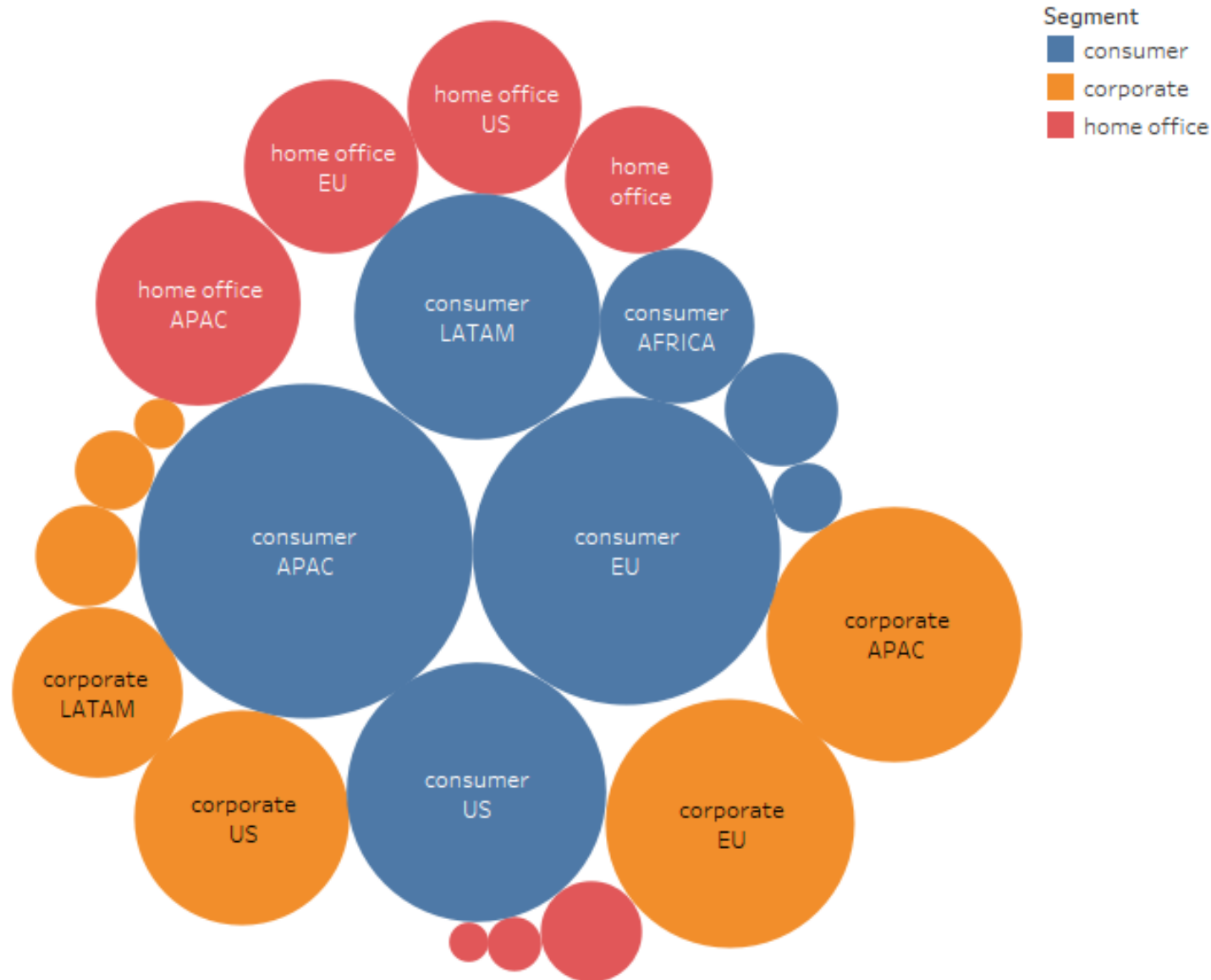
Segment

- consumer
- corporate
- home office

Market	Segment	Profit	Sales
CANADA	home office	3103.23	11895.33
EMEA	home office	5866.263	148844.733
AFRICA	home office	20412.567	155067.447
LATAM	home office	43135.13376	385505.6538
US	home office	60298.6785	429653.1485
EU	home office	60748.0545	488364.5445
APAC	home office	83445.2538	690524.1138
CANADA	corporate	5036.46	19313.73
EMEA	corporate	12499.134	250571.394
AFRICA	corporate	20686.965	204938.955
LATAM	corporate	57875.42136	645252.4814
US	corporate	91979.134	706146.3668
EU	corporate	123393.9795	920008.2795
APAC	corporate	129737.2348	1078466.315
CANADA	consumer	9677.7	35719.11
EMEA	consumer	25532.574	406745.184
AFRICA	consumer	47772.099	423766.809
LATAM	consumer	120632.932	1133847.032
US	consumer	134119.2092	1161401.345
EU	consumer	188687.7075	1529716.238
APAC	consumer	222817.5604	1816753.7

Sum of Profit and sum of Sales for each Market. Color shows details about Segment.

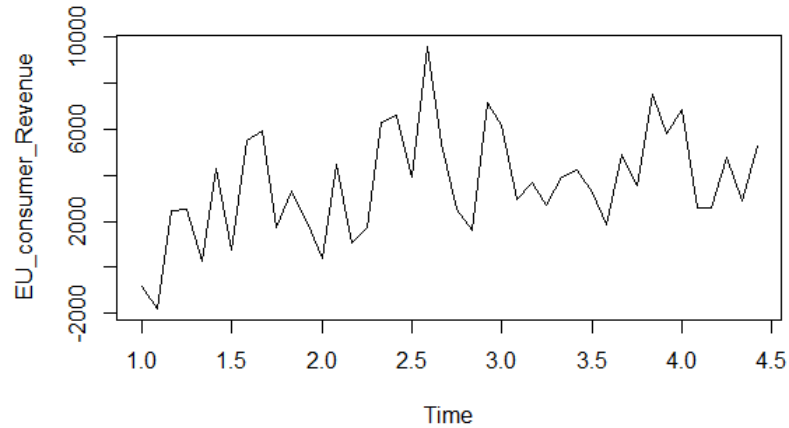
Sum of Profit and Sales for Market vs Segment



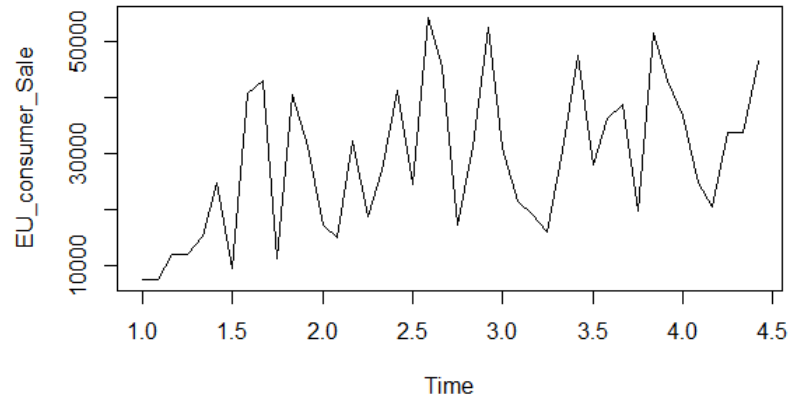
Segment and Market. Color shows details about Segment. Size shows sum of Profit. The marks are labeled by Segment and Market.

Time series for EU and APAC regions

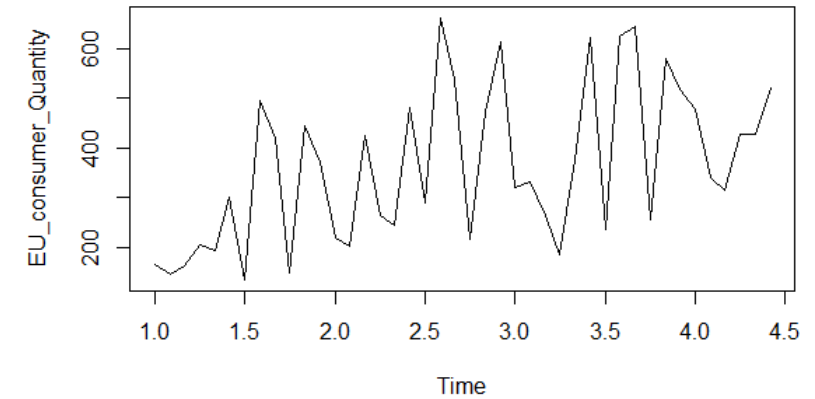
EU-Consumer Market Segment - Revenue



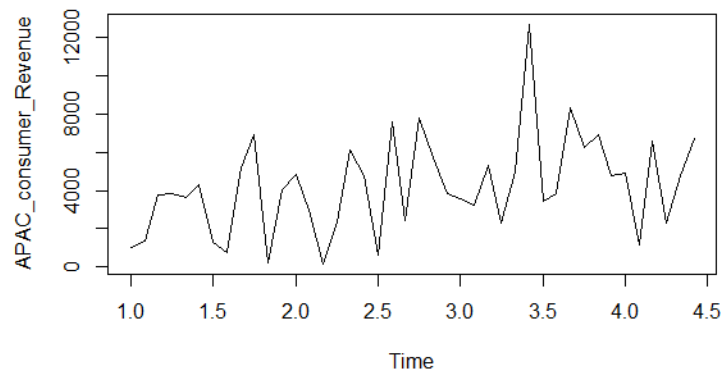
EU-Consumer Market Segment - Sales



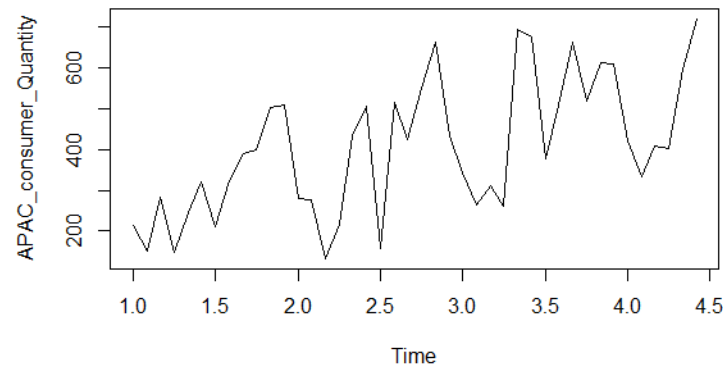
EU-Consumer Market Segment - Demand



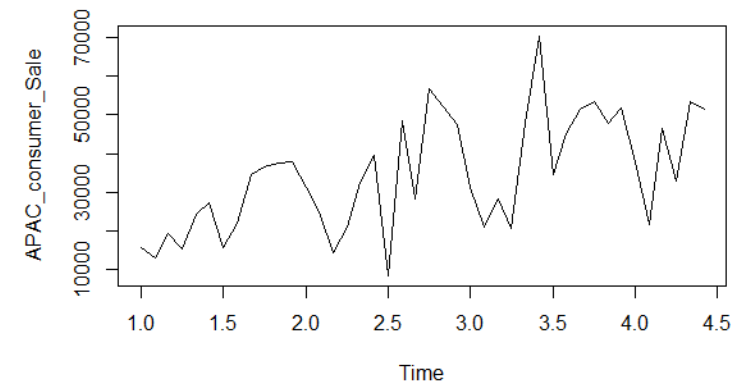
APAC-Consumer Market Segment - Revenue



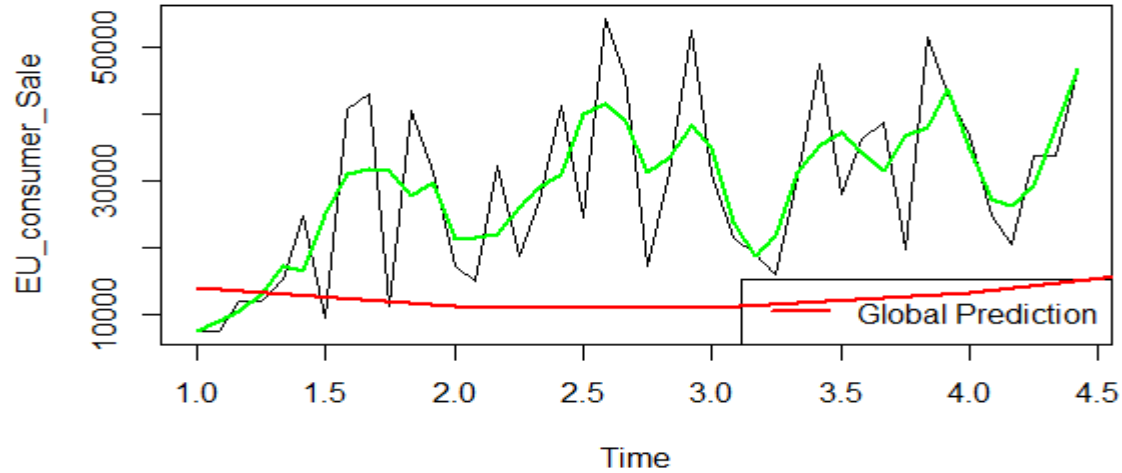
APAC-Consumer Market Segment - Demand



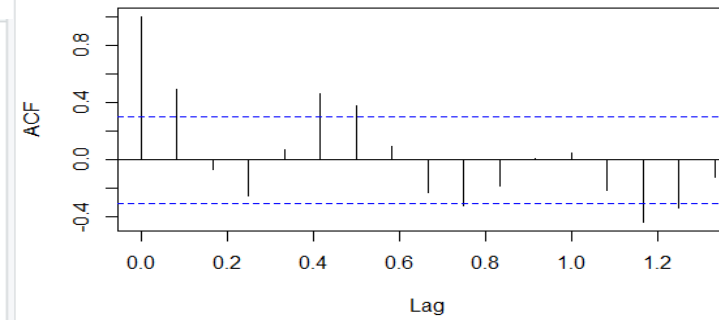
APAC-Consumer Market Segment - Sales



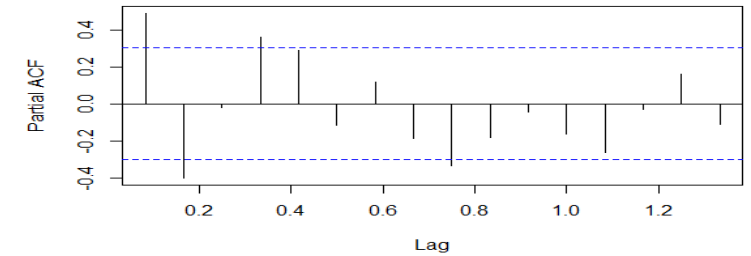
EU Consumer Sales - Smooth time Series



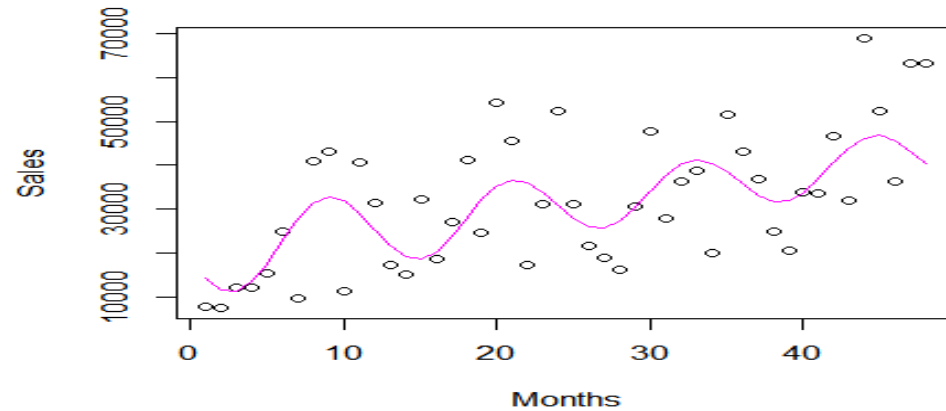
ACF for EU_Consumer Sales



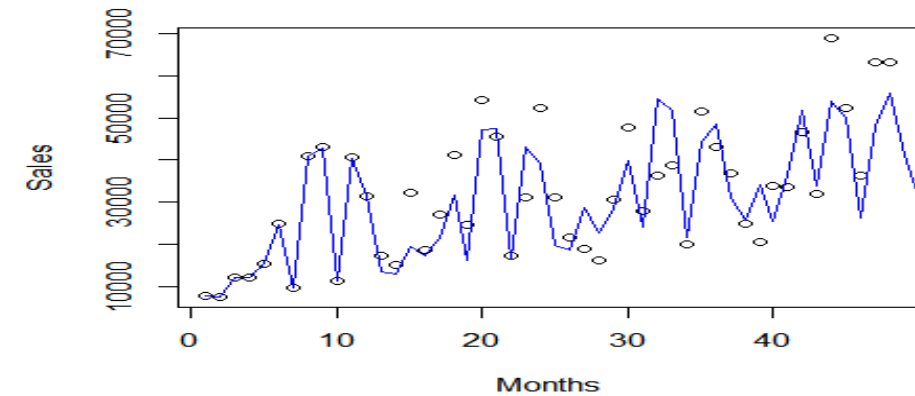
PACF for EU_Consumer Sales



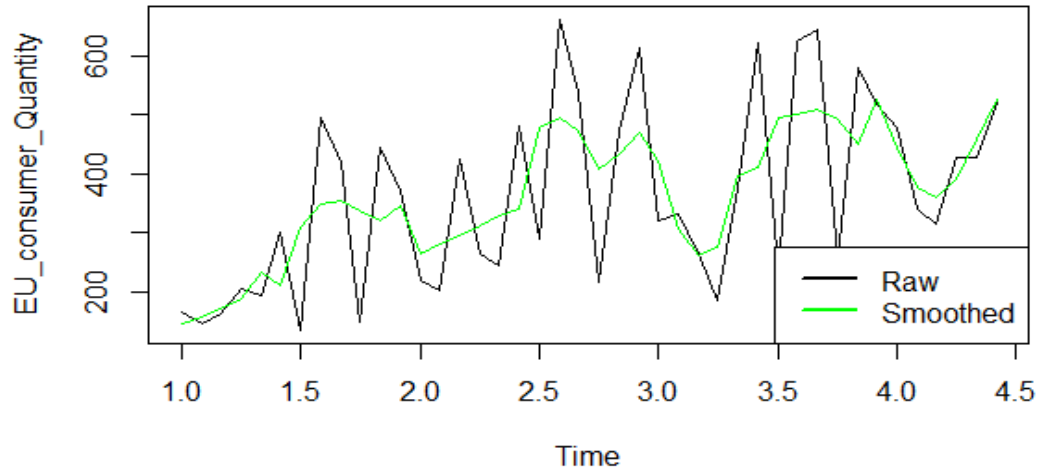
Original and Forecasted Values - EU Consumer Sales



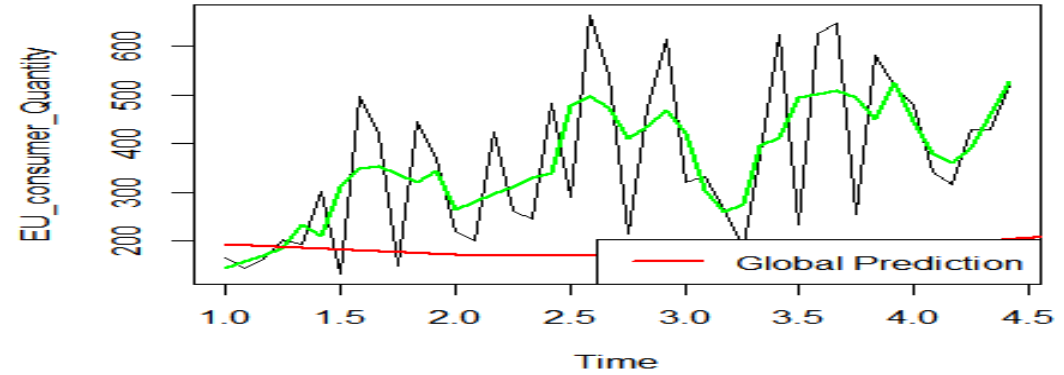
Original and Forecasted - EU_consumer Sale



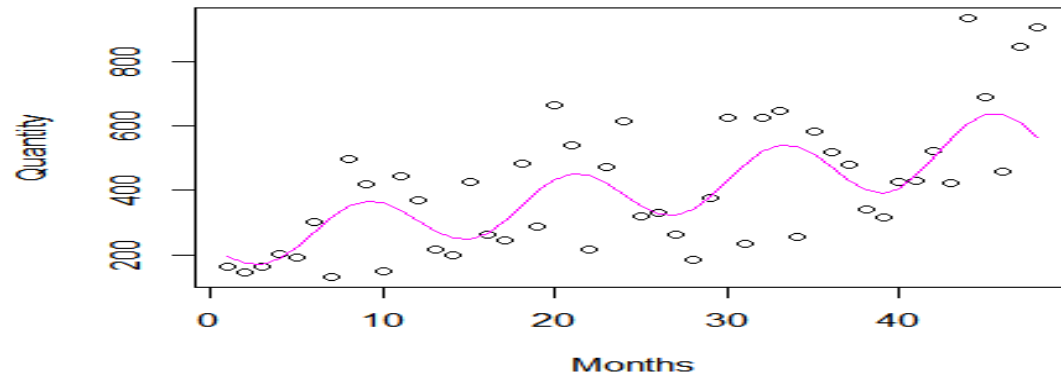
EU-Consumer Market Segment - Demand



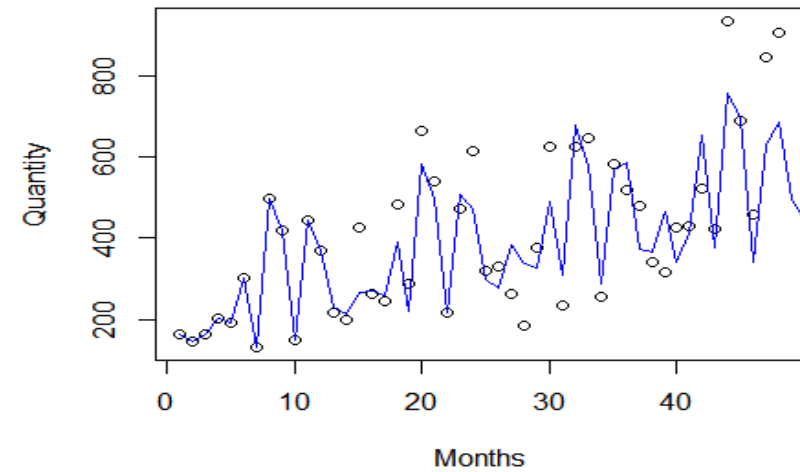
EU Consumer Quantity - Smooth time Series



Original and Forecasted Values - EU consumer Demand

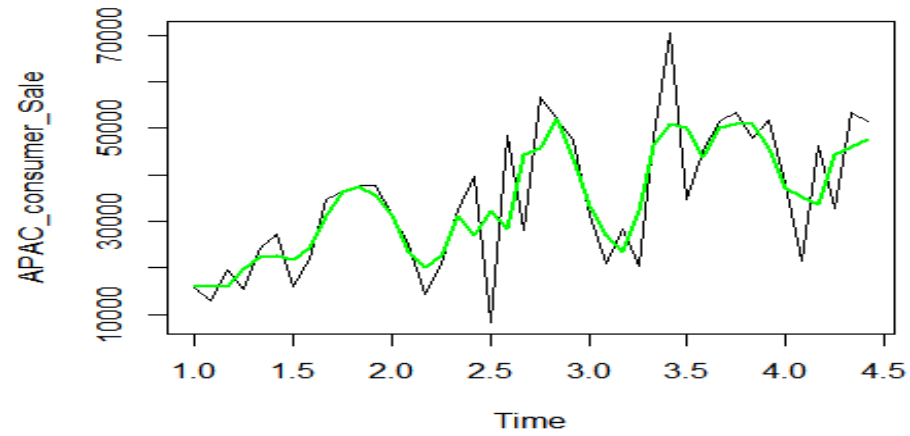


Original and Forecasted - EU consumer Demand

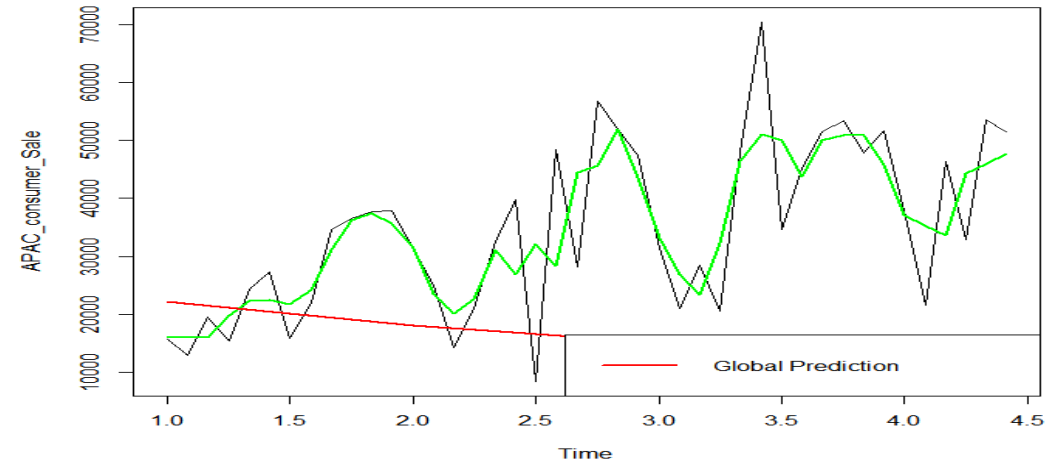


APAC CONSUMER SALES – CLASSICAL. DECOMPOSITION V/S AUTO.ARIMA

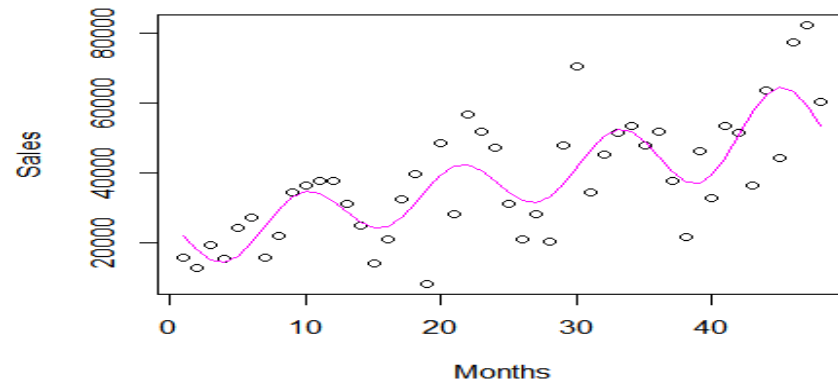
APAC Consumer Sales - Smooth time Series



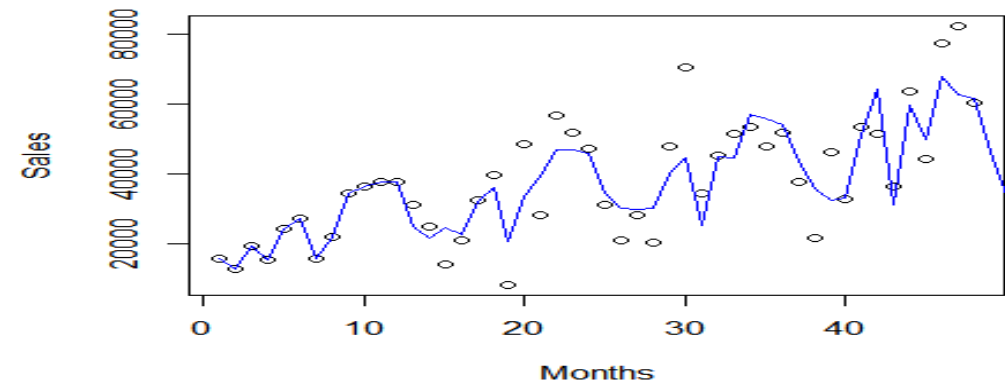
APAC Consumer Sales - Smooth time Series



Original and Forecasted Values - APAC consumer S

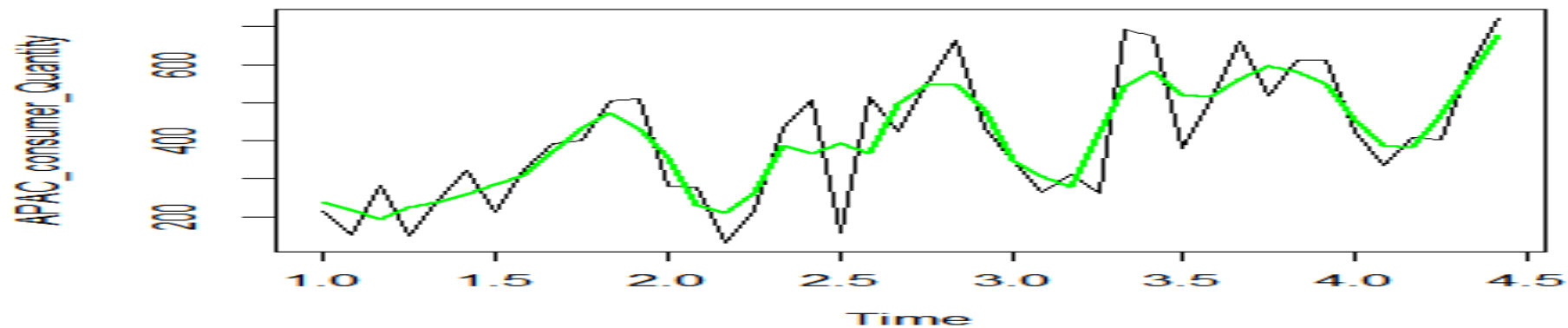


Original and Forecasted - APAC consumer Sales

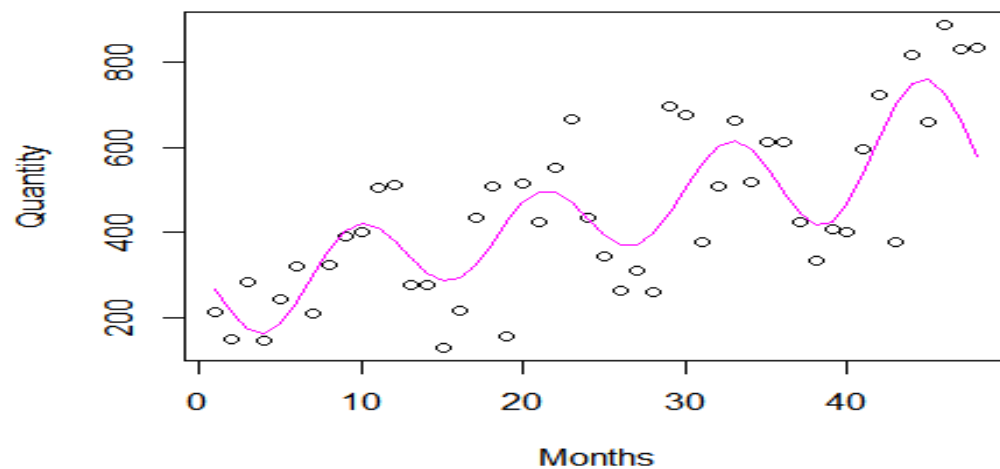


APAC CONSUMER DEMAND – CLASSICAL. DECOMPOSITION V/S AUTO.ARIMA

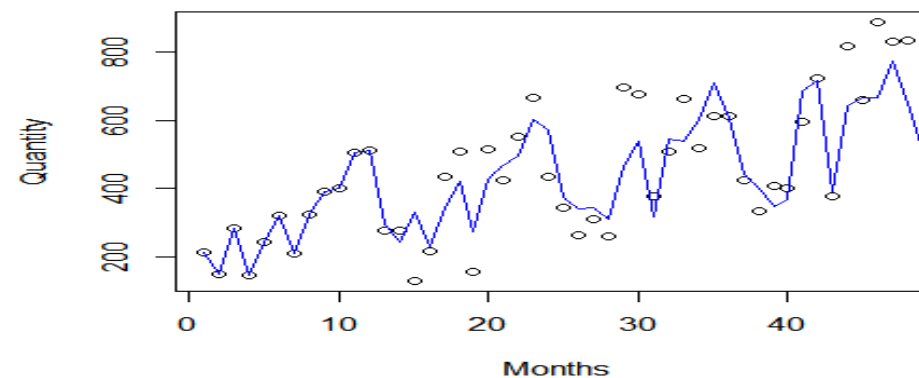
APAC Consumer Quantity - Smooth time Series



Original and Forecasted Values - APAC consumer Demand



Original and Forecasted - APAC consumer Demand



CONCLUSION

- EU & APAC Consumers Market Segments are the 2 most profitable
- With the classical decomposition model, we could isolate seasonal or trend variations from white noise
- EU & APAC Consumers Sales & Demand are locally predicted weakly stationary
- Auto.Arima model results have proven to give better forecast results for the Sales & Demand of EU & APAC Consumers Market Segments