



**Group Name:**

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## Business Problem:

Global Mart is an online store with world wide operations catering to 7 markets segments with 3 categories. Data is available from Jan-2011 to Dec-2014. The sales/operational manager wants to finalize plan for the next 6 months and is looking for forecast of sales and demand for next 6 months which will help manage the revenue and inventory

## Business Objective:

The objective here is to identify the two most profitable markets buckets out of 7 market segments in 3 categories and forecast sales and demand for these two segments

## Approach:

- Understand the transactional data
- Analyze the profitability of each market segment within the 3 categories and identify top 2 segments
- Forecast sales and demand for each of the top 2 segments for next 6 months

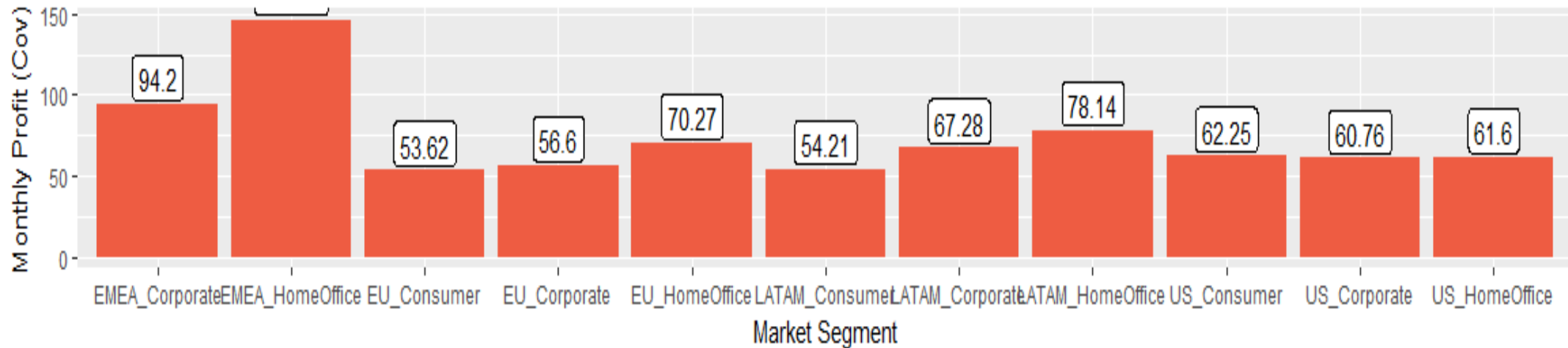
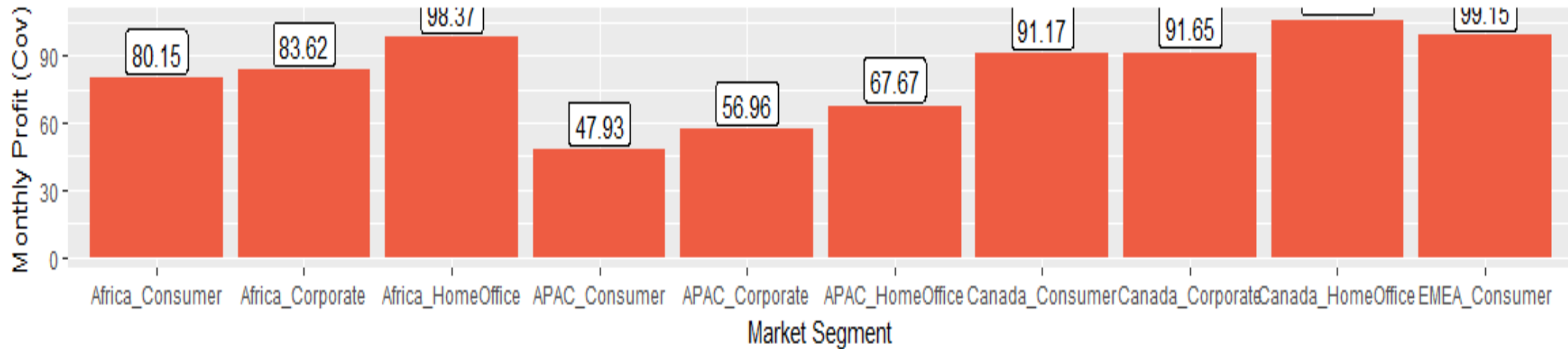
## Data Description:

Employee Data Files	Data Details
Global Superstore	51290 transactional records with 24 variables

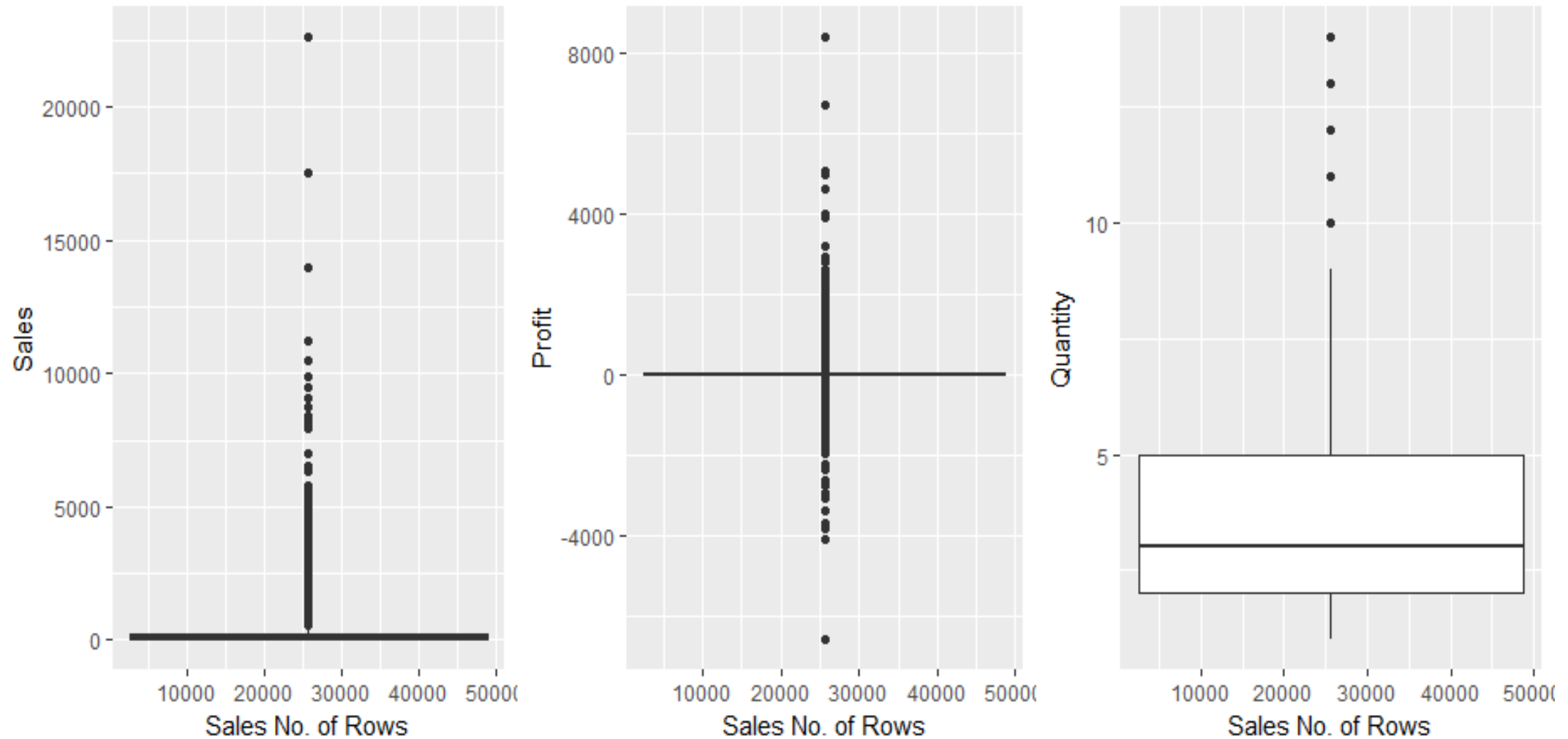
- The dataset contains information on 51290 orders and 24 attributes relating to demography, category, market segment, quantity, sales and profit
- There are 7 markets
  - Africa
  - APAC
  - Canada
  - EMEA
  - EU
  - LATAM
  - US
- There are 3 categories
  - Consumer
  - Corporate
  - HomeOffice

- **Data Uniqueness and NA check:**
  - **Checking for uniqueness of Orders**
  - **Checking duplicate data**
  - **Checking missing data for each column**
- **Missing value imputation for data with NA values**
- **Outlier treatment of Continuous numeric data**
- **Deriving metrics from the available data to be able to gain more insights**

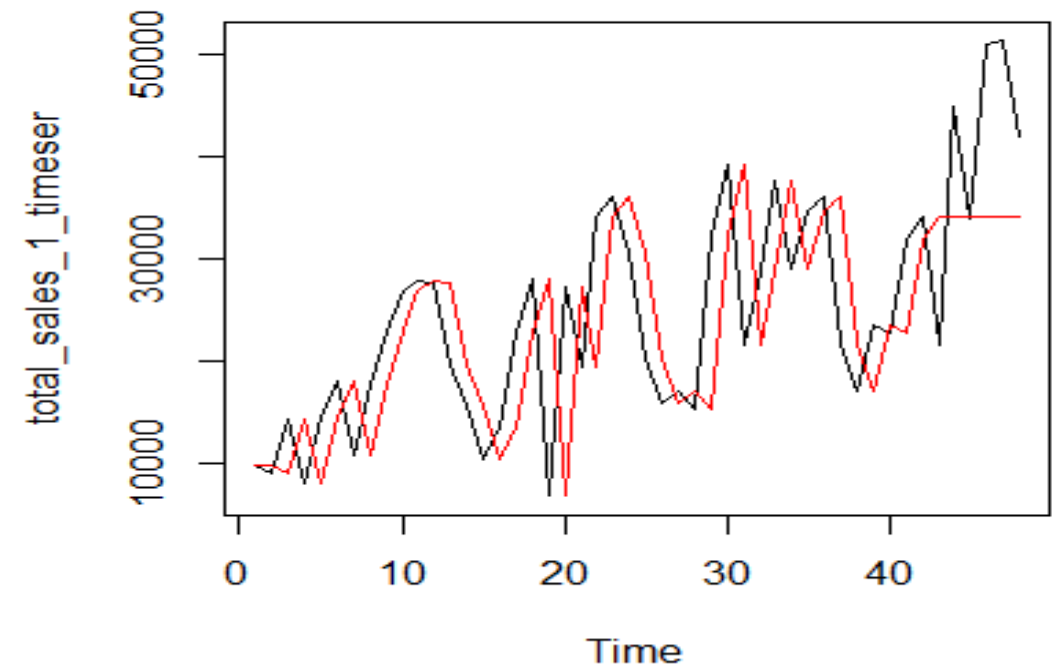
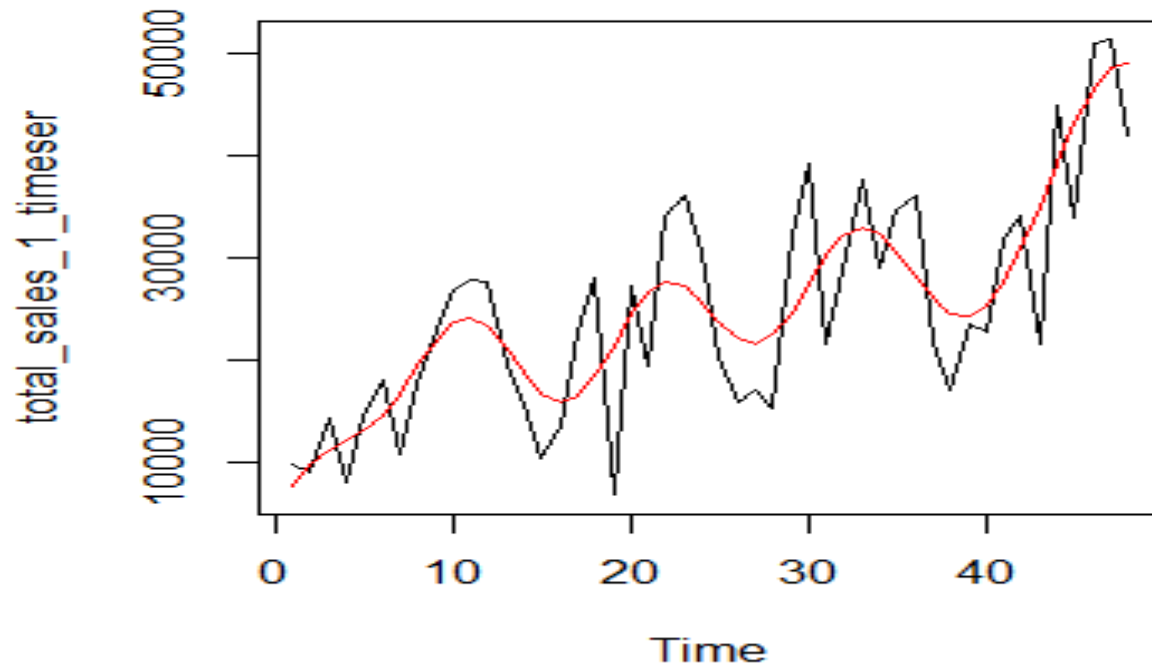
# Outlier handling



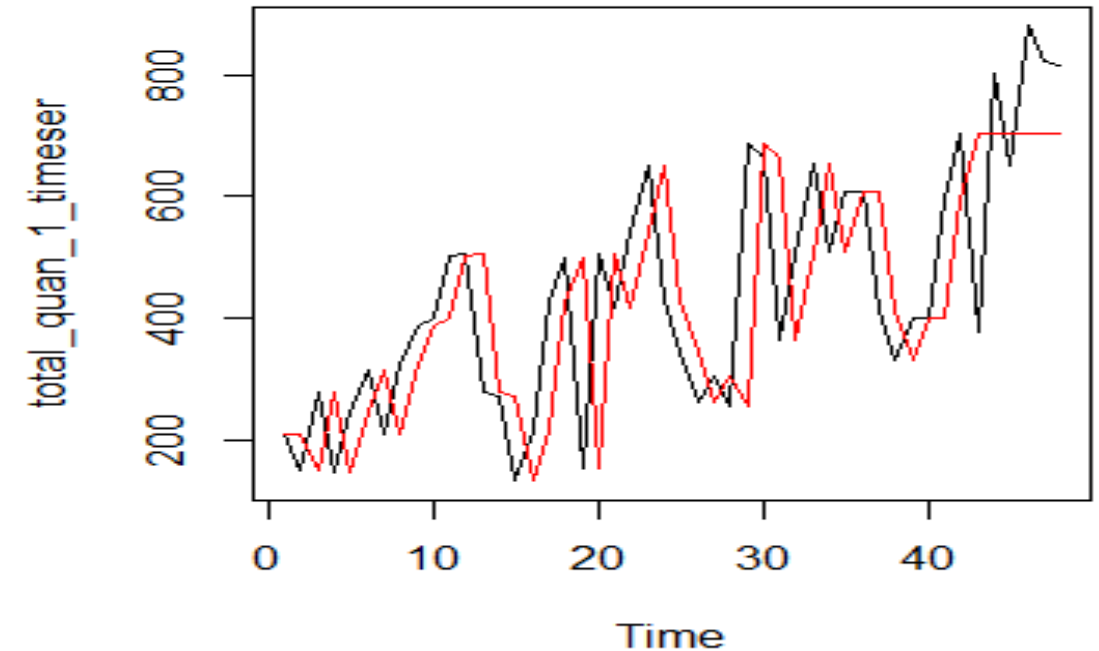
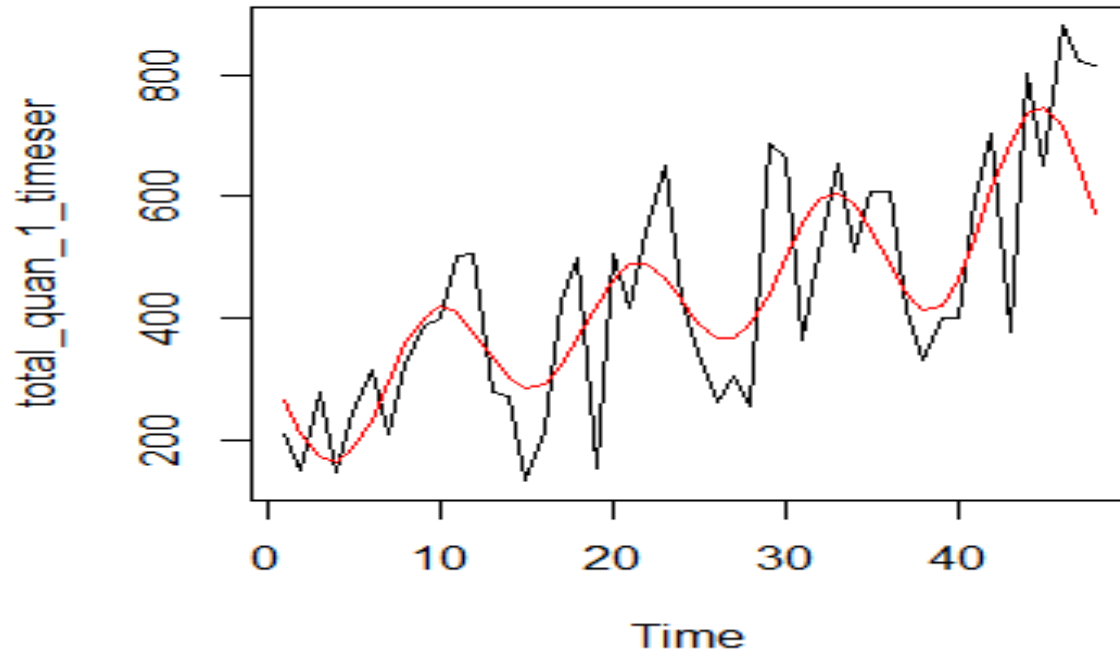
- The plot is showing covariance of monthly profit of 21 Market segments
- It is clear that APAC\_Consumer and EU\_Consumer are consistently most profitable segments



We can see few outliers in the data which can impact the forecast. These have to be treated

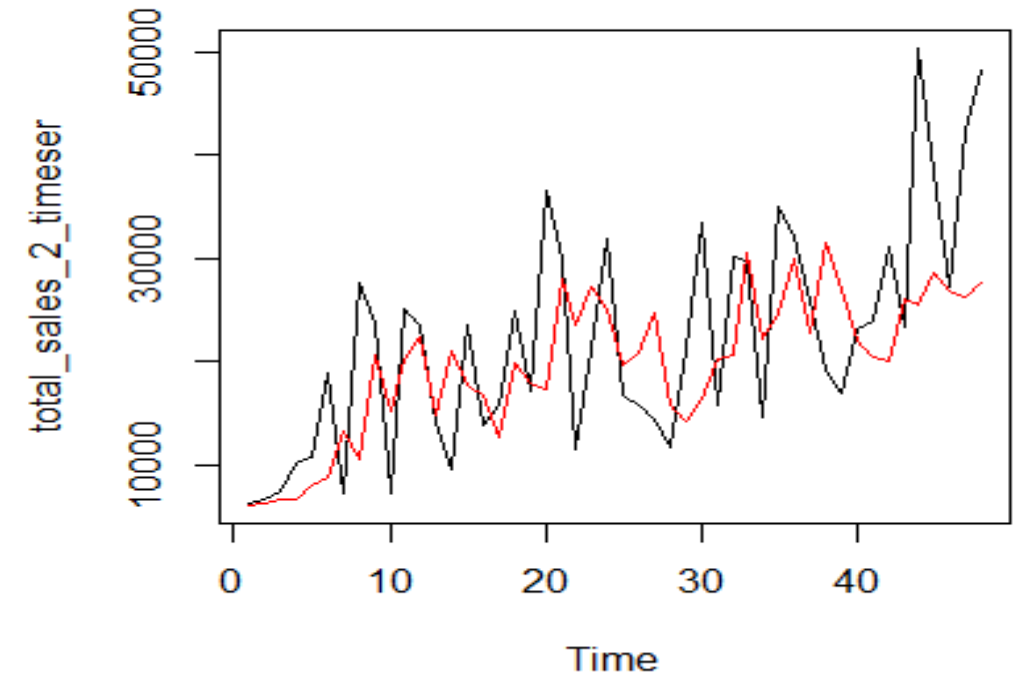
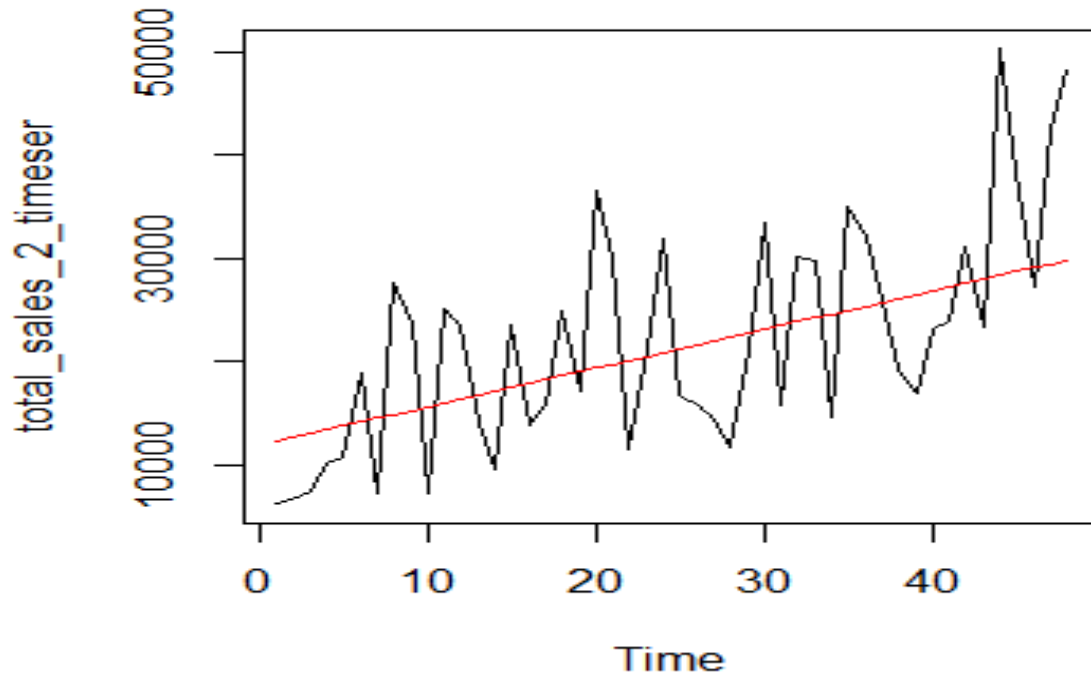


- Sales forecast was done using classical method(chart on the left) and AutoARIMA(chart on the right)
- The black line represents original time series and the red line represents the prediction
- Visually the classical model of forecasting seems to be more in tune with the actual data

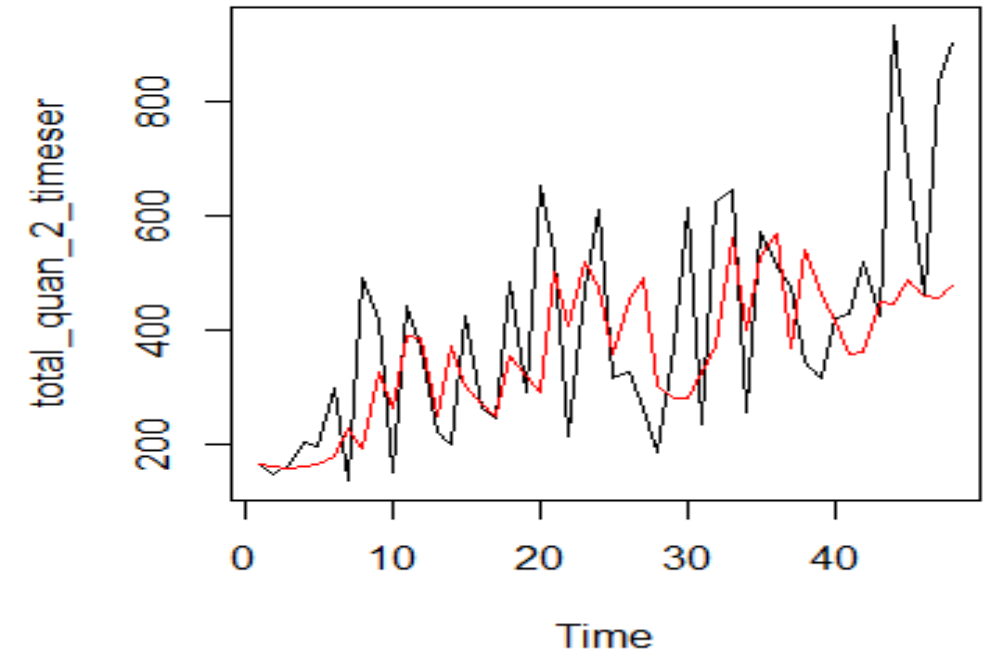
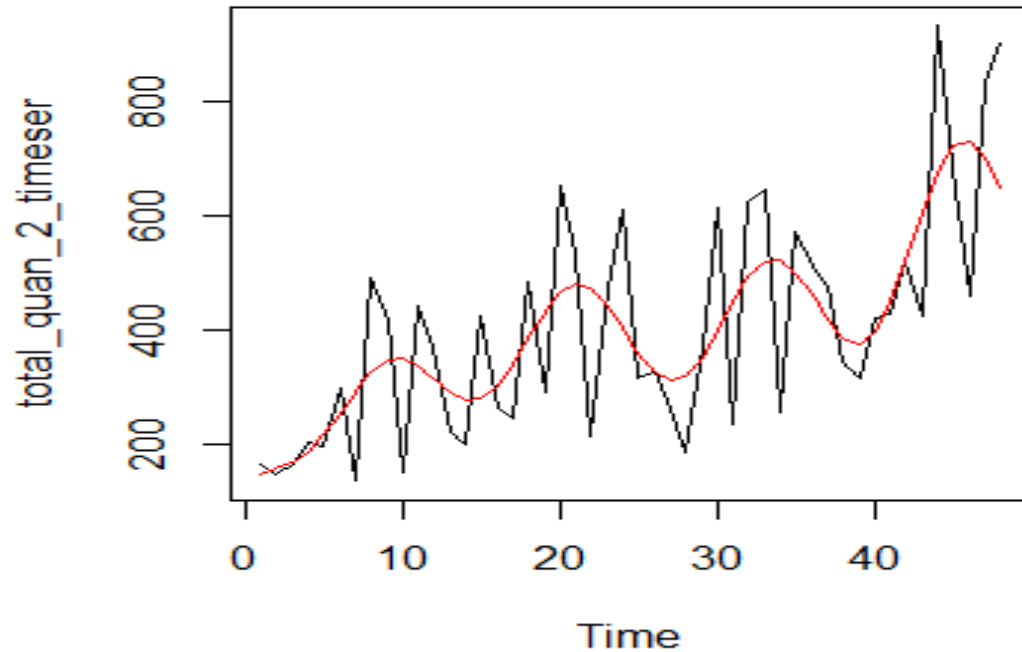


- Quantity forecast was done using classical method(chart on the left) and AutoARIMA(chart on the right)
- The black line represents original time series and the red line represents the prediction
- Visually the classical model of forecasting seems to be more in tune with the actual data as auto ARIMA curve has flattened towards the end





- Sales forecast was done using classical method(chart on the left) and AutoARIMA(chart on the right)
- The black line represents original time series and the red line represents the prediction
- Visually the Auto ARIMA model of forecasting seems to be more in tune with the actual data as classical model is representing a linear trend only.



- Quantity forecast was done using classical method(chart on the left) and AutoARIMA(chart on the right)
- The black line represents original time series and the red line represents the prediction
- Visually the classical model of forecasting seems to be more in tune with the actual data as auto ARIMA curve has flattened towards the end

## Forecast of Sales and Quantity from July-2015 – Dec-2016

Month	Market Segment - EU Consumer		Market Segment - APAC Consumer	
	EU Consumer Sales	EU Consumer Quantity	APAC Consumer Sales	APAC Consumer Qunatity
Jan-15	27988.62	687.75	34994.29	704.5
Feb-15	28361.70	736.33	39129.44	704.5
Mar-15	28734.78	756.51	43060.91	704.5
Apr-15	29107.86	715.52	46349.66	704.5
May-15	29480.95	651.56	48507.09	704.5
Jun-15	29854.03	572.15	49022.44	704.5

Based on the analysis performed and validation of various models, here is the forecast of Sales and Quantity from Jan-2015 – June-2016

This data can be used by the sales/operations manager to plan the next 6 months to manage revenue and inventory

	Market Segment - EU Consumer		Market Segment - APAC Consumer	
Month	EU Consumer Sales	EU Consumer Quantity	APAC Consumer Sales	APAC Consumer Qunatity
Jan-15	30227.11	585.90	47470.64	704.5
Feb-15	30600.19	543.91	43697.75	704.5
Mar-15	30973.27	544.63	38034.86	704.5
Apr-15	31346.36	603.83	31453.65	704.5
May-15	31719.44	723.62	25565.47	704.5
Jun-15	32092.52	890.00	22393.79	704.5

# Thank You!

