Mahindra First Choice Services, Case Study

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Contents of Presentation

➢ **Geological Based Customer Analysis:**

- Problem Statement – 1:

- Identifying the ownership pattern of cars throughout the country.

- Problem Statement – 2:

- Identify the type of order each state receives

➢ **Market Segmentation:**

- Problem Statement:

- Customer Lifetime Value Prediction – Based on Customer Segments using Time series analysis

Geological Based Customer Analysis:

- Problem Statement – 1:

- Identifying the ownership pattern of cars throughout the country. This also captures the

- problem wherein information regarding the spending patterns can be identified.

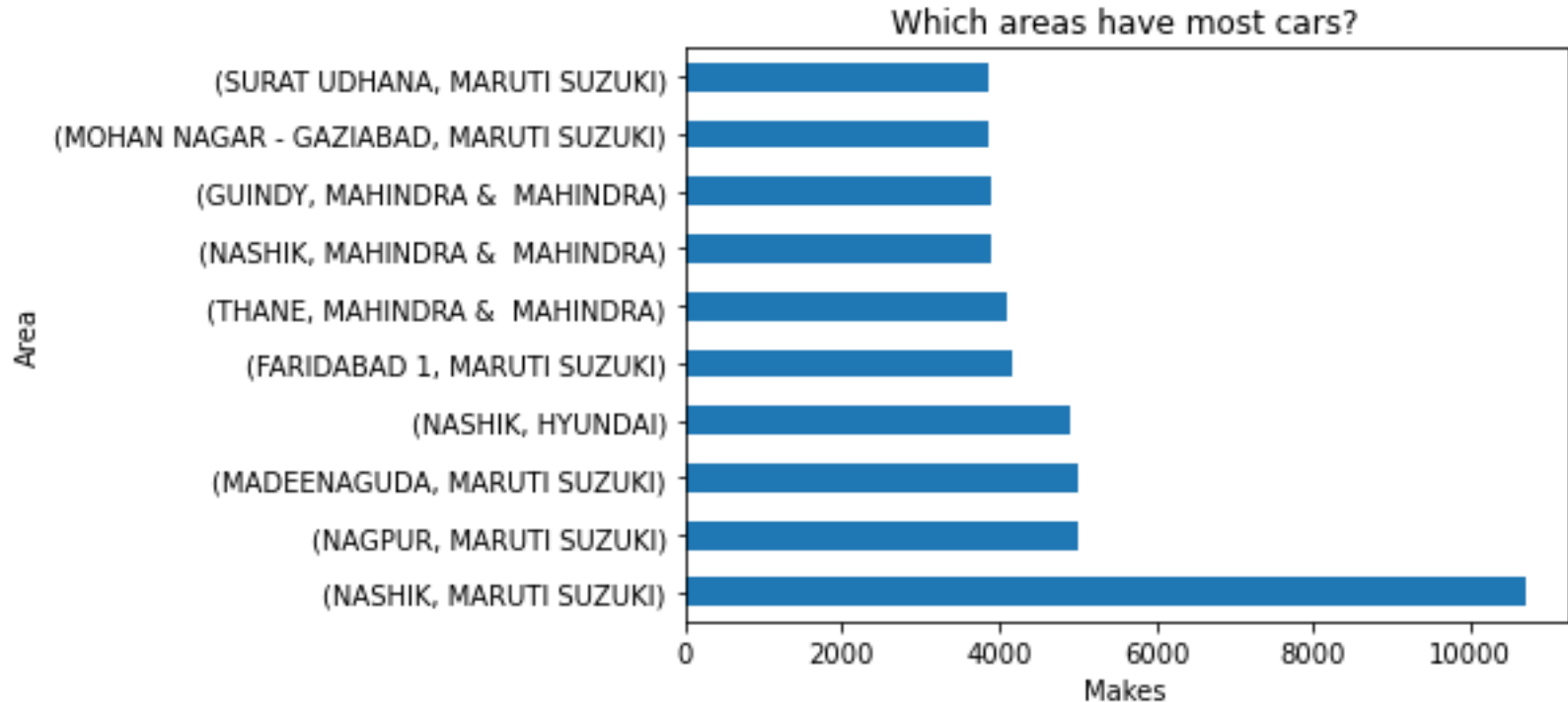# Which make/car is more popular?

Maruti Suzuki is most trusted band and many models are from Maruti suzuki people like to purchase.Less no. of people prefer models like Vento,Duster,Linea
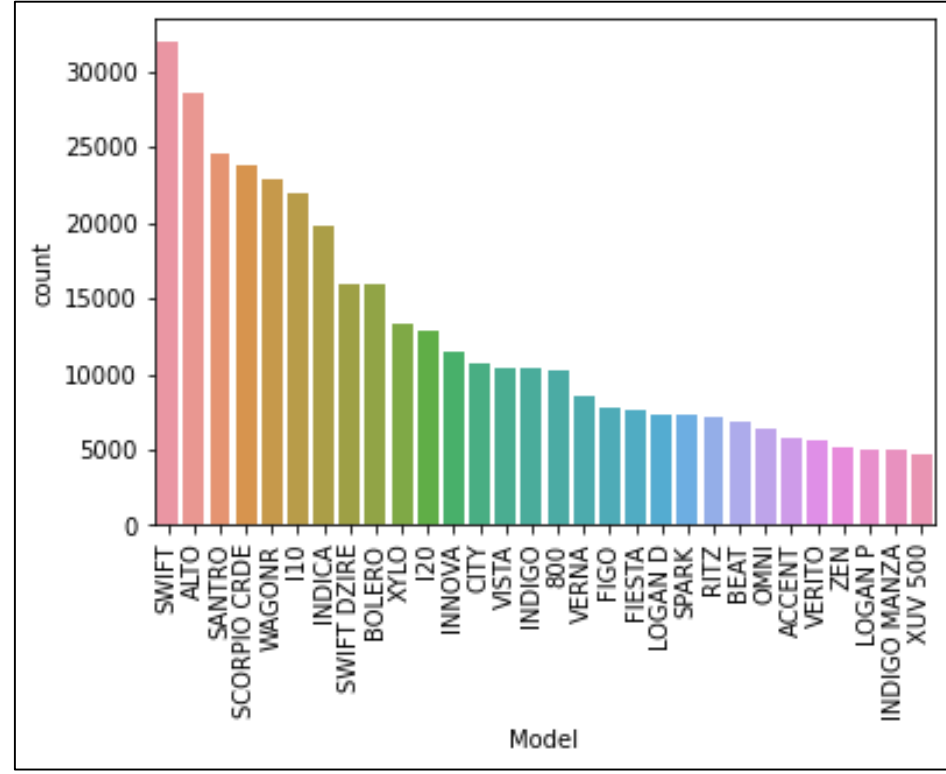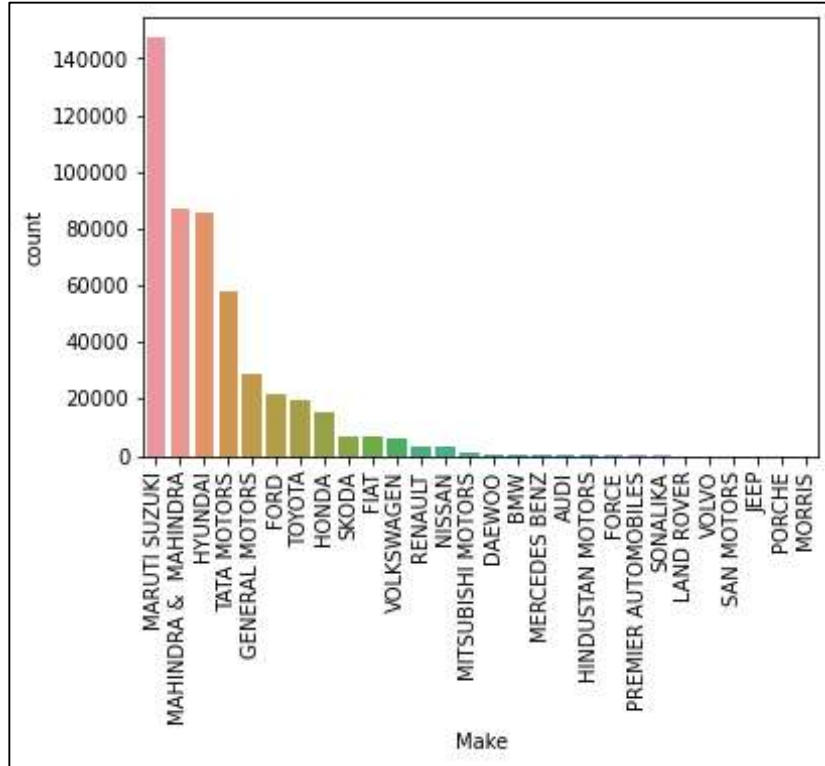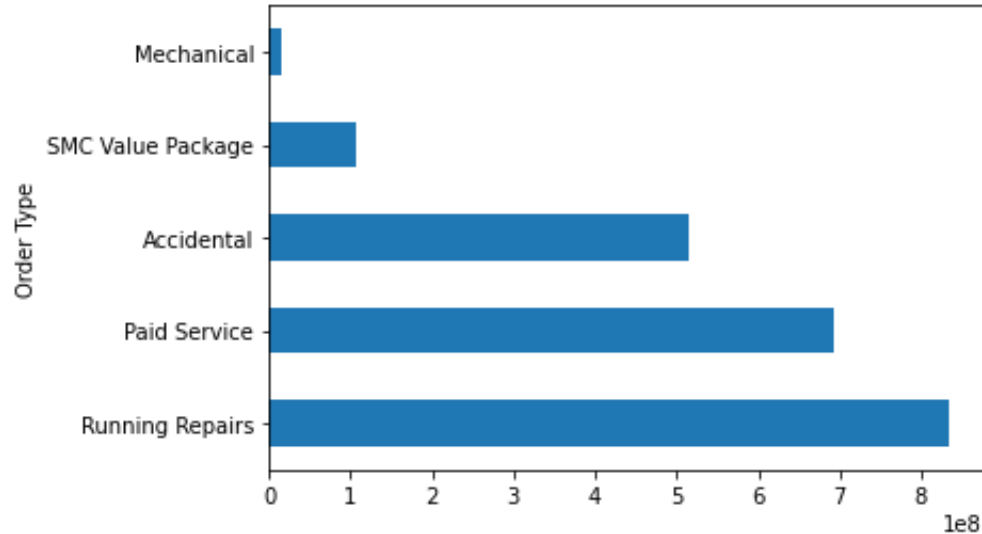
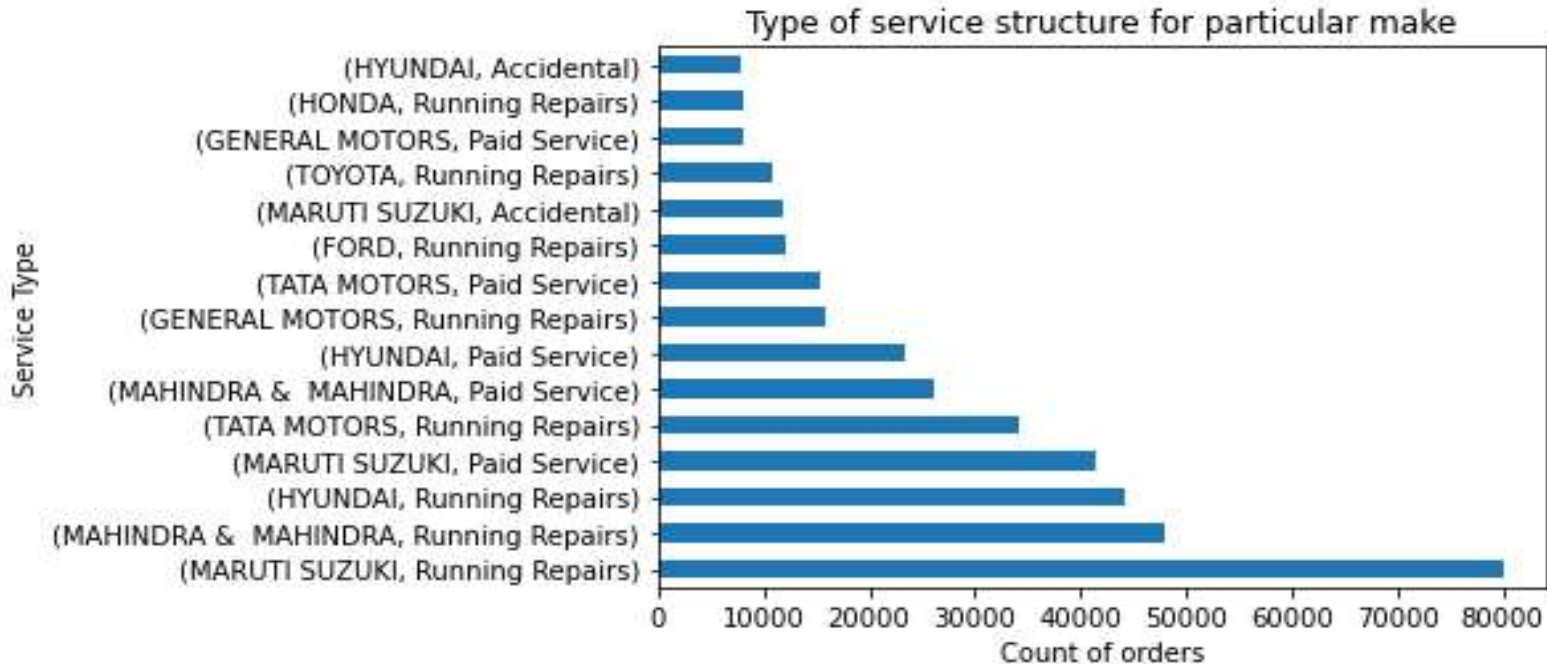# Which Service is most Popular
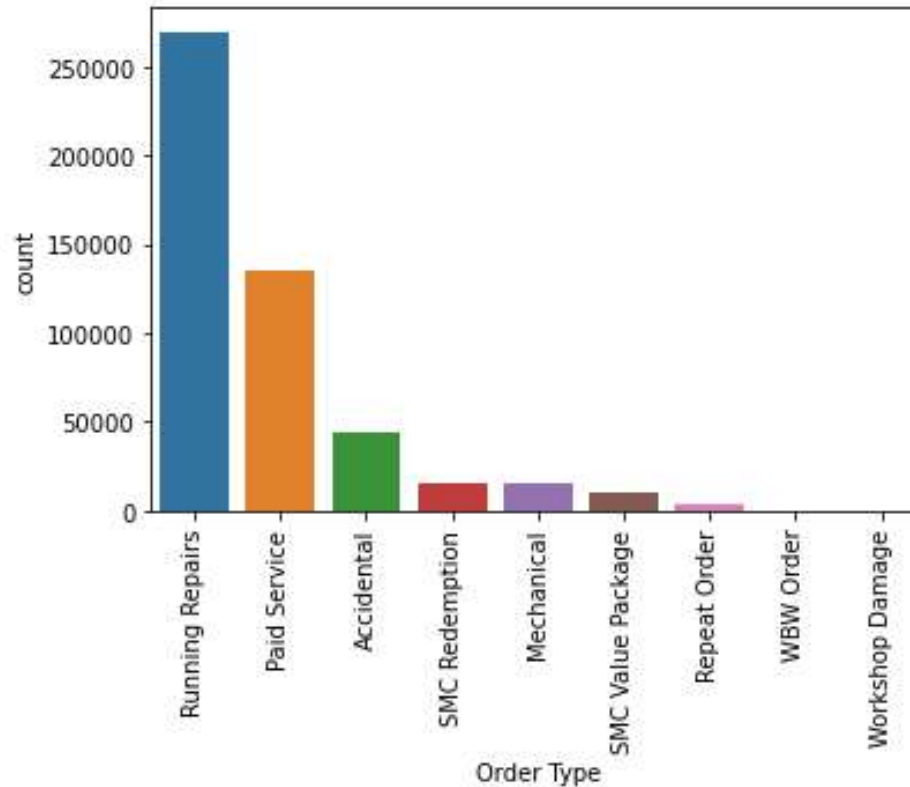
Which areas have most cars serviced?

Which Service is most Revenue

For running repairs most revenue is generated

What is service structure for particular make/car?

As Maruti Suzuki,Mahindra & Mahindra and Hyundai are popular brand

Type of service structure for particular make

Service Type	Count of orders
(HYUNDAI, Accidental)	~7500
(HONDA, Running Repairs)	~8000
(GENERAL MOTORS, Paid Service)	~8000
(TOYOTA, Running Repairs)	~10000
(MARUTI SUZUKI, Accidental)	~11500
(FORD, Running Repairs)	~11500
(TATA MOTORS, Paid Service)	~15000
(GENERAL MOTORS, Running Repairs)	~15500
(HYUNDAI, Paid Service)	~23000
(MAHINDRA & MAHINDRA, Paid Service)	~26000
(TATA MOTORS, Running Repairs)	~34000
(MARUTI SUZUKI, Paid Service)	~41000
(HYUNDAI, Running Repairs)	~44000
(MAHINDRA & MAHINDRA, Running Repairs)	~48000
(MARUTI SUZUKI, Running Repairs)	~80000

Which type of service is popular in a certain area i.e. repairs or paid ?

Type of service structure for particular area
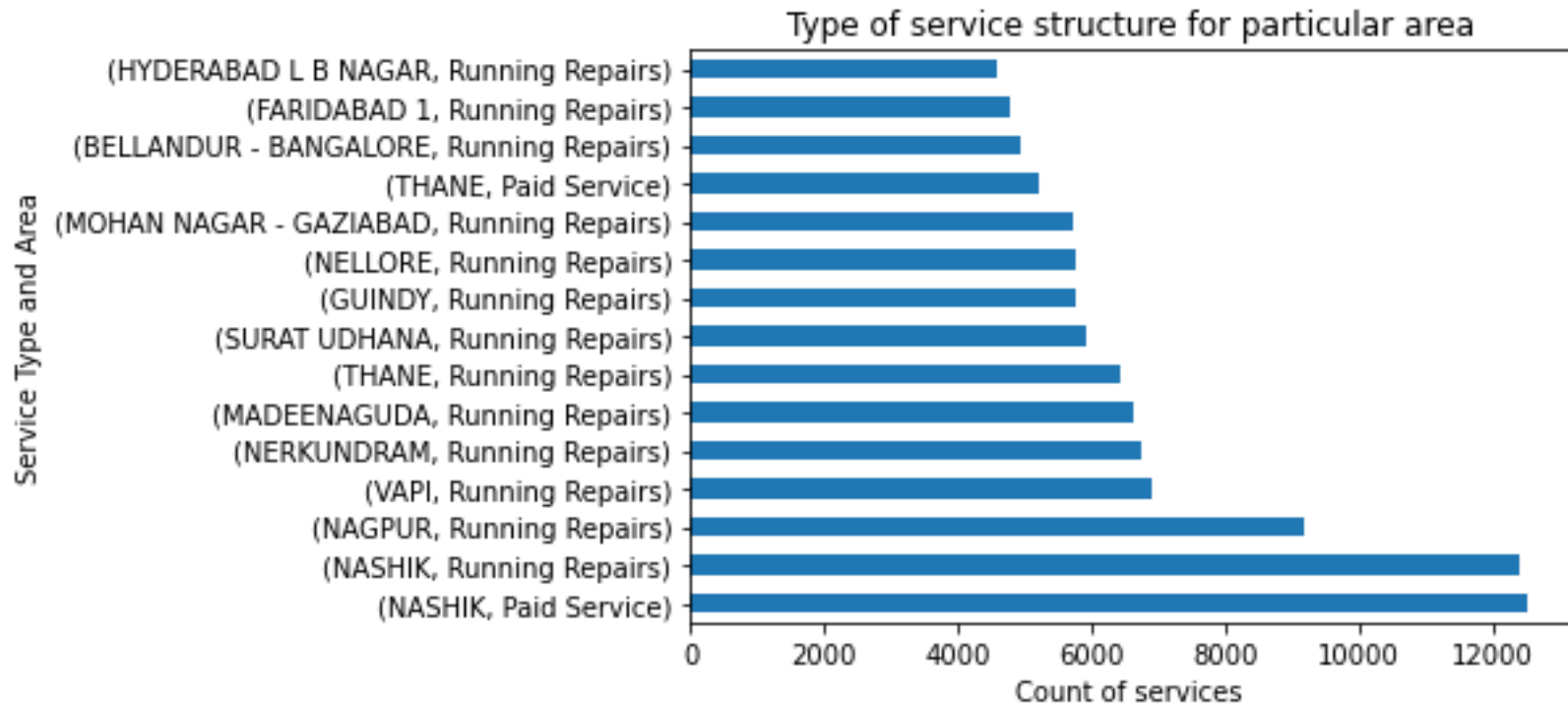
Make and Model Proportion
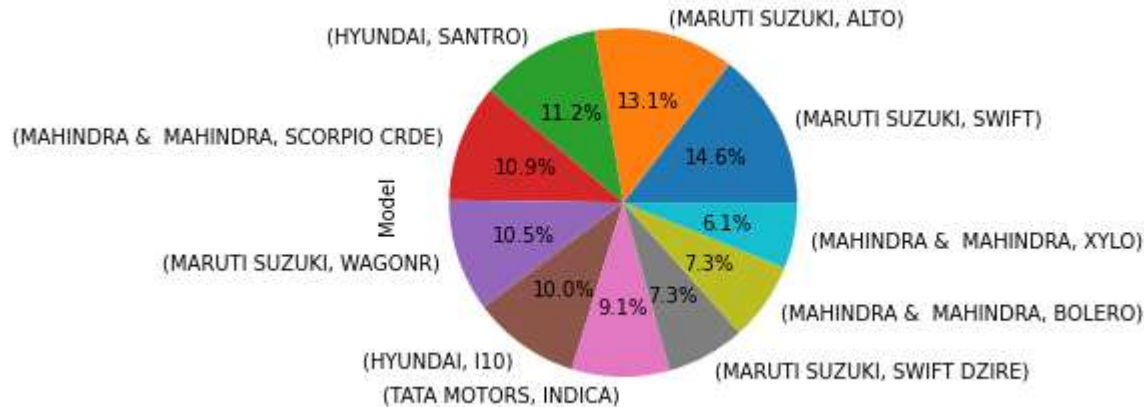
Dividing the cars as per their KM reading

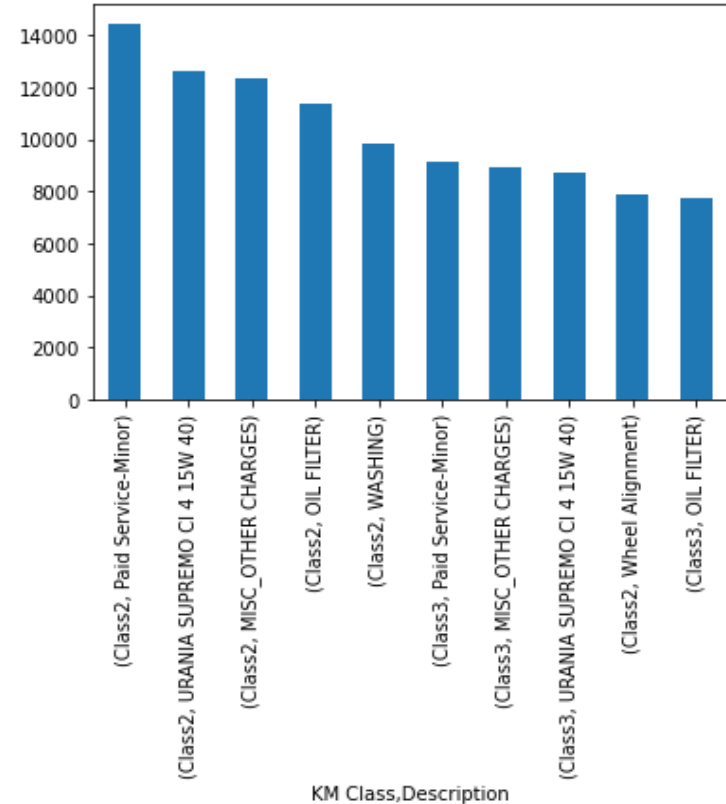| Class	Km Reading	% Car Count
Class 1	< 20k	10.28
Class 2	20k < 60k	41.84
Class 3	60k < 100k	15.62
Class 4	100< 160k	15.80

% of KM class
- Class2   41.841717
- Class3   32.250838
- Class4   15.621125
- Class1   10.286320
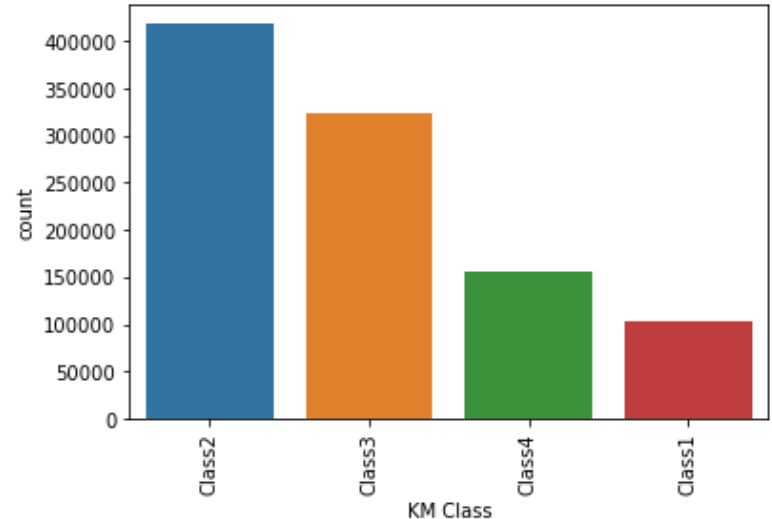
For class 2 ,class 3 and class 4 vehicles Running repairs and paid services are frequently required
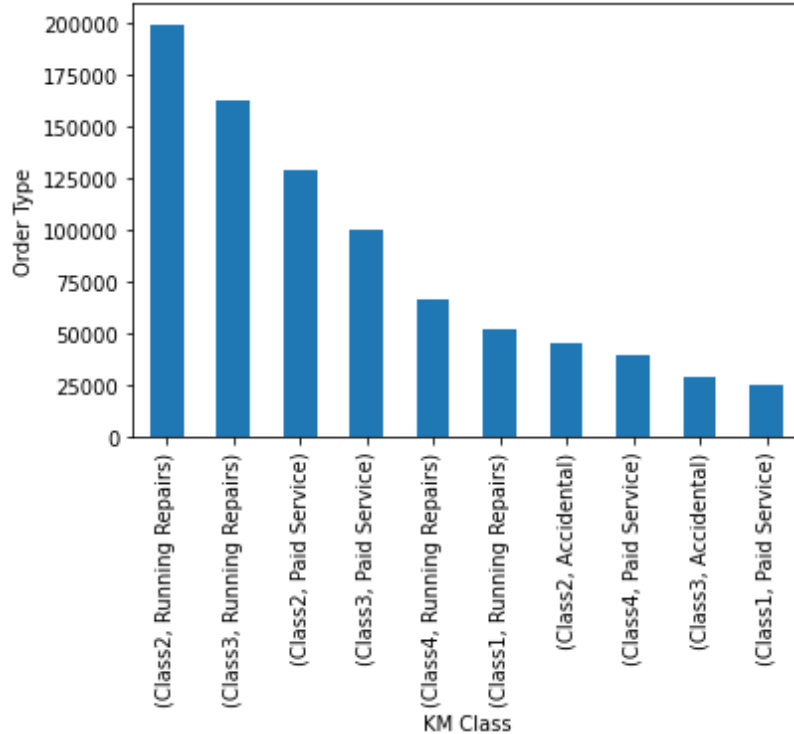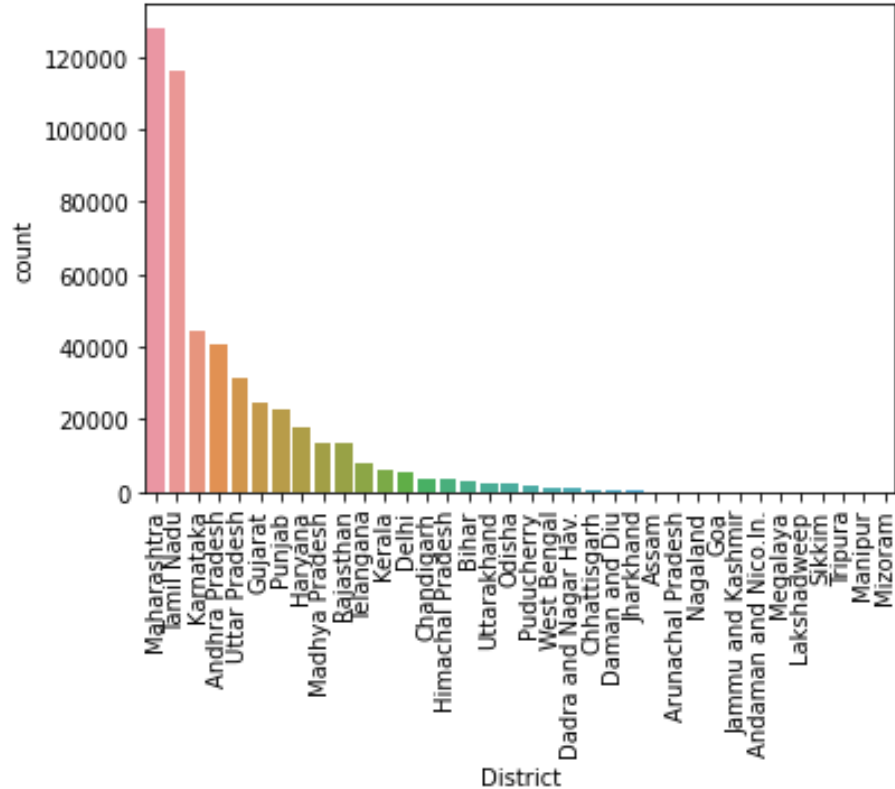
For class 2 and class 3 Oil change and oil filter change are major services

Maximum orders by District

Maharashtra   128119

Tamil Nadu   116309

Karnataka   44135

Andhra Pradesh   40604

Uttar Pradesh   31534

Gujarat   24403

RFM Analysis

➤ **RFM** (Recency, Frequency, Monetary) analysis is a customer segmentation technique that uses past purchase behavior to divide customers into groups. RFM helps divide customers into various categories or clusters to identify customers who are more likely to respond to promotions and also for future personalization services.

➤ It is based on the marketing axiom that **80% of your business comes from 20% of your customers**. RFM helps to identify customers who are more likely to respond to promotions by segmenting them into various categories.(Courtesy: Rsquaredacademy)

➤ RECENCY (R): Days since last purchase

➤ FREQUENCY (F): Total number of purchases

➤ MONETARY VALUE (M): Total money this customer spent.

➤ We will create those 3 customer attributes for each customer.

Segments of customers based on Recency, Frequency and Monetary score

Segment	Description	Recency Score	Frequency Score	Monetary Score
Champions	Bought recently, buy often and spend the most.	4 - 5	4 - 5	4 - 5
Loyal Customers	Spend good money. Responsive to promotions.	2 - 4	3 - 4	4 - 5
Potential Loyalists	Recent customers, spent good amount, bought more than once	3 - 5	1 - 3	1 - 3
New Customers	Bought more recently but not often	4 - 5	< 2	< 2
Promising	Recent shoppers but haven't spent much	3 - 4	< 2	< 2
Need Attention	Above average recency, frequency & monetary values	3 - 4	3 - 4	3 - 4
About to Sleep	Below average recency, frequency & monetary values	2 - 3	< 3	< 3
At Risk	Spent big money, purchased often but long time ago	< 3	2 - 5	2 - 5
Can't Lose Them	Made big purchases and often but long time ago	< 2	4 - 5	4 - 5
Hibernating	Low spenders, low frequency and purchased long time ago	2 - 3	2 - 3	2 - 3
Lost	Lowest recency, frequency & monetary values	< 2	< 2	< 2

Now that we have the score of each customer, we can represent our customer segmentation. We will combine recency, frequency and monetary score into RFM score columns

customer_id	date_most_recent	recency_days	transaction_count	amount	recency_score	frequency_score	monetary_score	rfm_score
<chr>	<date>	<dbl>	<dbl>	<dbl>	<int>	<int>	<int>	<dbl>
1 1	2013-03-30	1310	4	0	1	5	1	151
2 10	2013-06-17	1231	5	11106.	1	5	5	155
3 100	2012-09-12	1509	2	20800.	1	4	5	145
4 1000	2014-10-14	747	6	8813.	2	5	4	254
5 10000	2015-08-22	435	7	1736.	2	5	3	253
6 100000	2015-04-18	561	1	6026.	2	1	4	214
7 100001	2015-11-16	349	3	4264.	3	5	4	354
8 100002	2015-04-18	561	1	0	2	1	1	211
9 100003	2015-04-18	561	1	0	2	1	1	211
10 100004	2015-04-18	561	1	249.	2	1	1	211

Segment	Count
<chr>	<int>
Others	89457
Potential Loyalist	33651
About To Sleep	32480
At Risk	24612
Champions	19881
Can't Lose Them	10994
Promising	10715
New Customers	10431
Need Attention	8636
Lost	8196
Loyal Customers	4431

➢We can see that we have divided our customers into 10 categories but there is one highest category i.e. others.
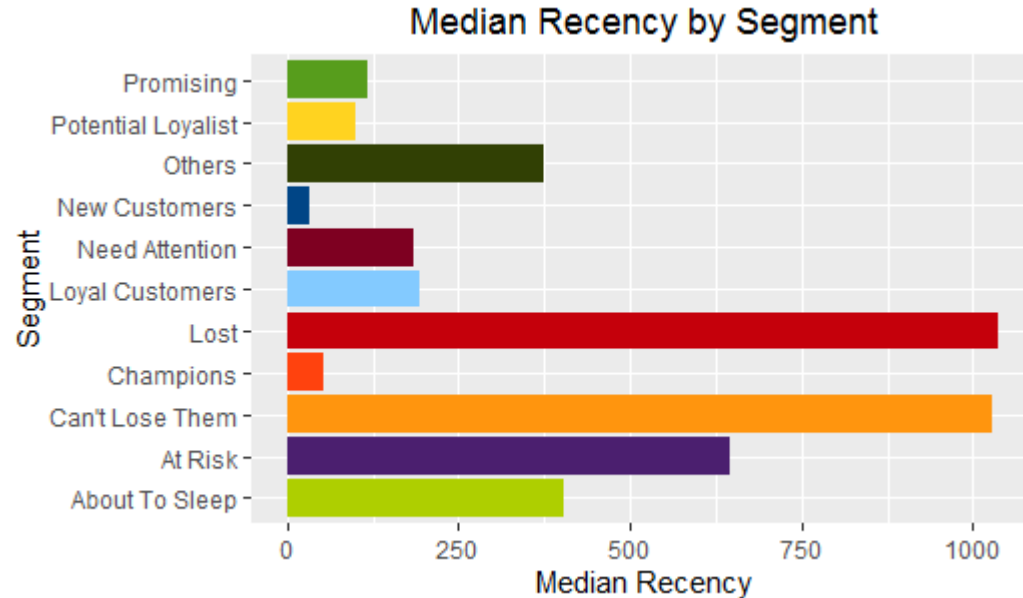
➢After that we have highest number potential loyalist customers then about to sleep and at risk customers where should focus by connecting with them though promotional activities

➢Champions are our prime customers

➢But we have very few Loyal customers which number needs to be increased

Median Recency

Median Recency by Segment

> From average recency chart we can observe that customers having recency score more than 500 we should focus more and take the feedback why they are not preferring MFCS

> Also customers with recency around 300 are about to lose, which are also more in number
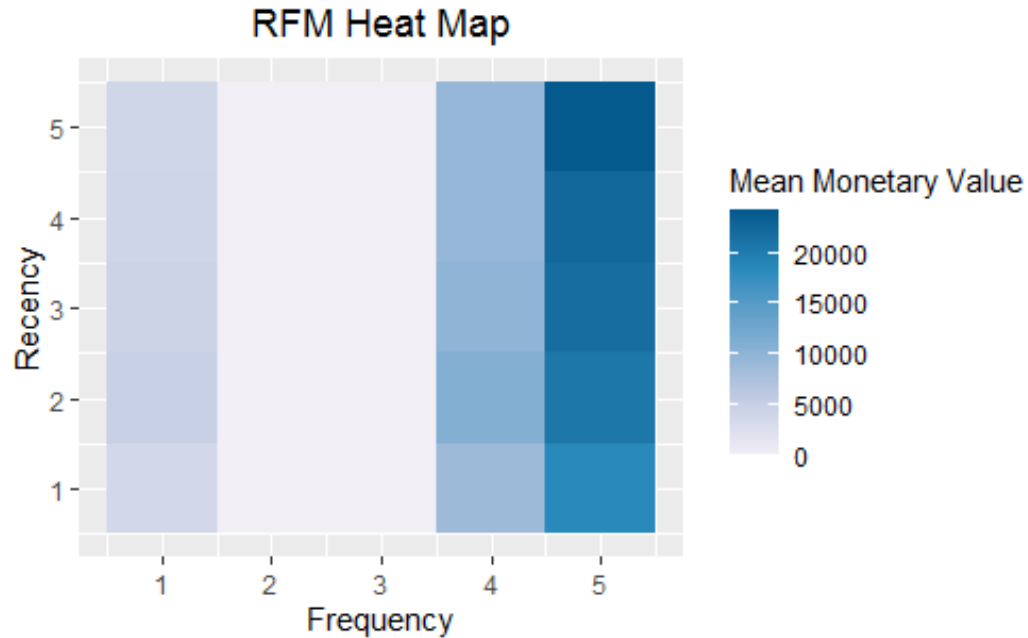
Median Frequency

Median Frequency by Segment

Median Monetary value
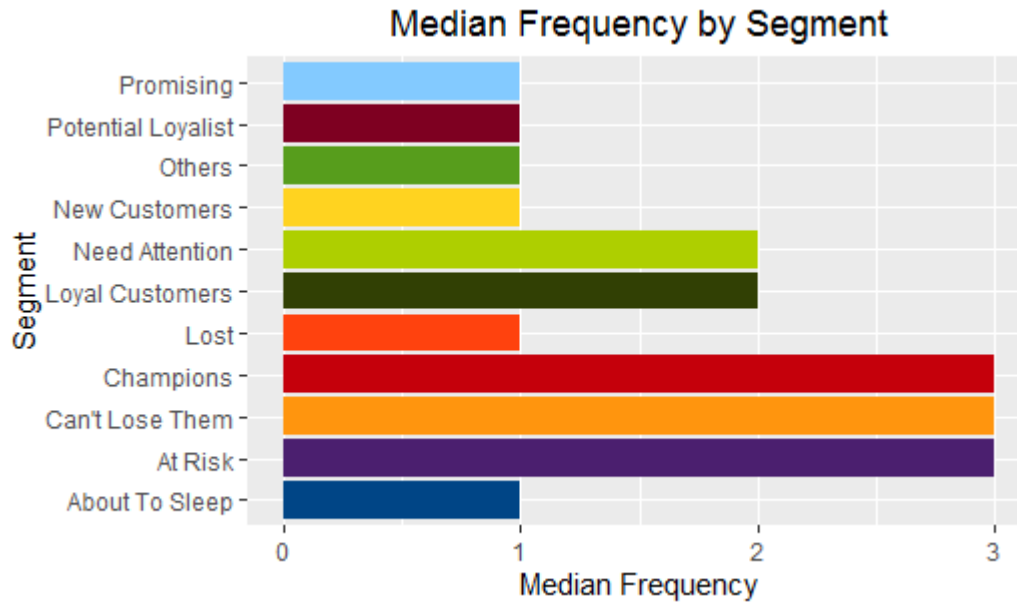
Median Monetary Value by Segment
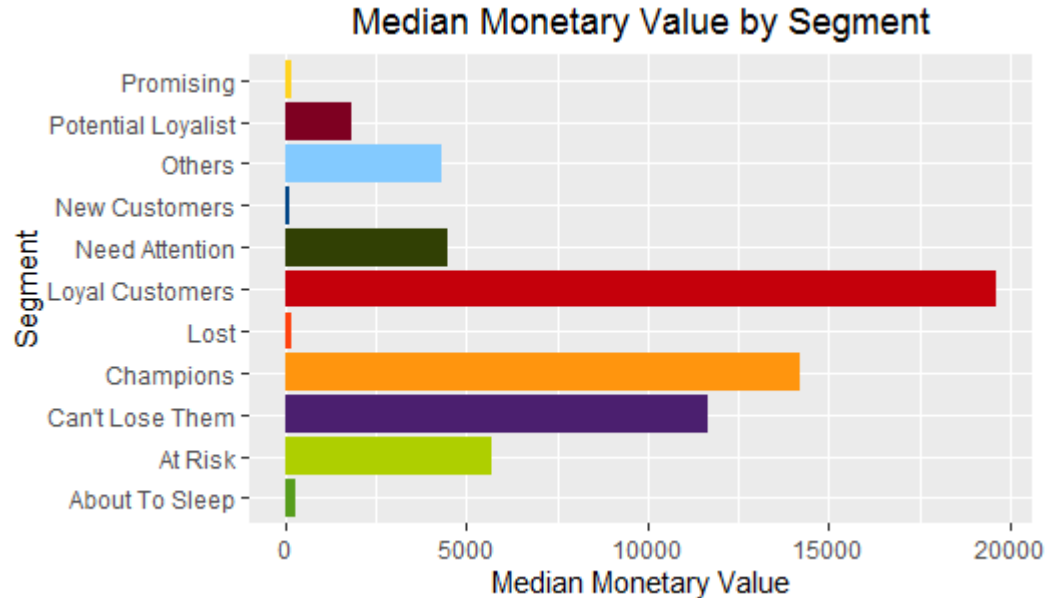
➢Even though 'Champion' customers are generating more revenue but our real gem is 'Loyal Customers'.

➢We have another important category 'cant loose them' they have made big purchases but their frequency is not good so we should check reason behind it.
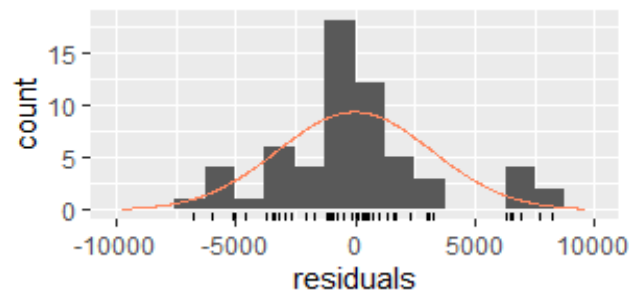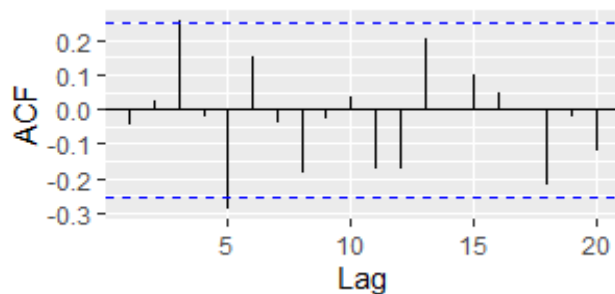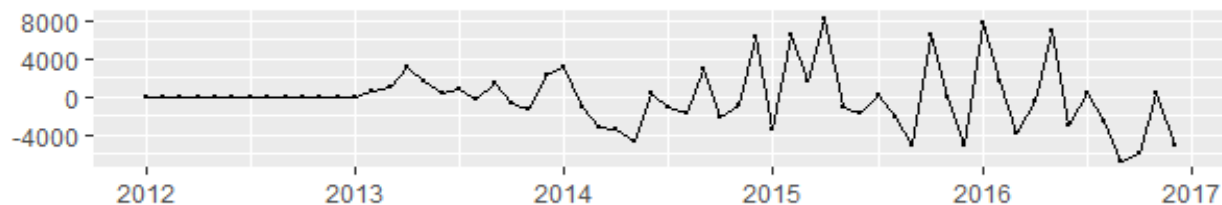
RFM Heatmap

Finally what we need is low Recency score, high frequency and high monetary value

Time Series Forecasting

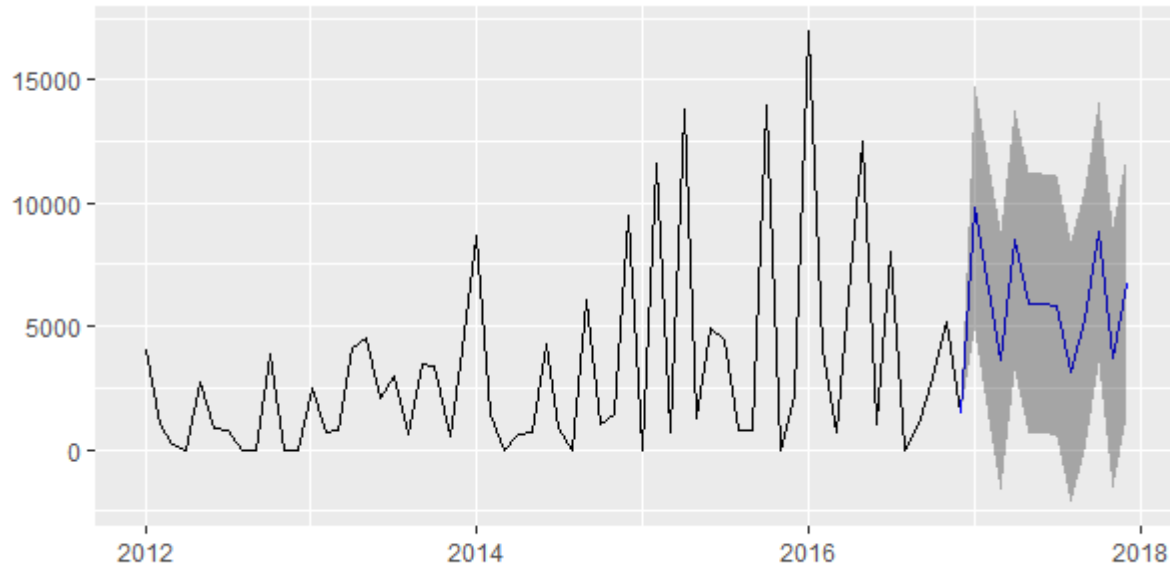Change in sales per month
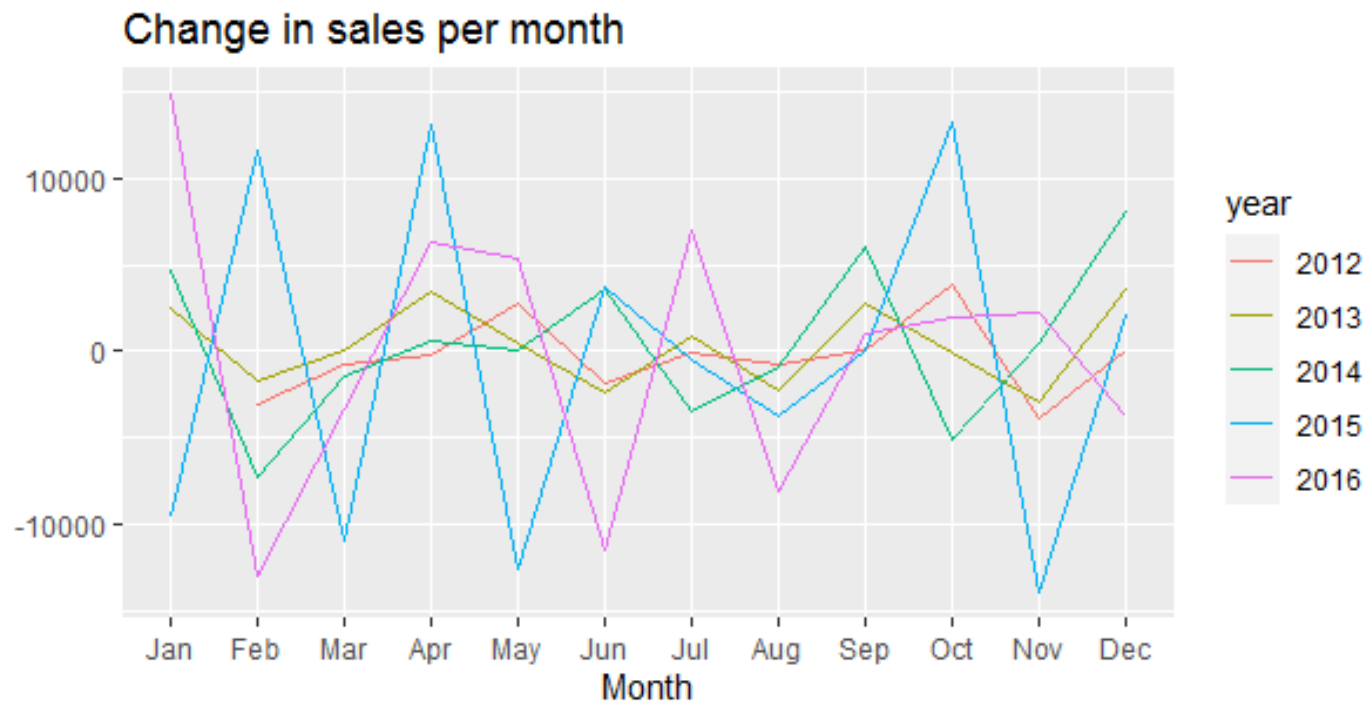
Fitting ARIMA model

Best model:
ARIMA(1,1,1)(1,1,1)[12]

(Ljung-Box test)

p-value = 0.01386

(Hence stationary)

Forecasting of Revenue for Next Year

Steps involved in solving the problem

Elaborate on following steps involved in your solution, this is not a comprehensive list feel free to add more points to this but you should have at least the following elements elaborated.

- ➢ Datasets used (provided by business, external datasets)
- ➢ High level data pipeline
  - ✚ Steps performed in data pre processing
  - ✚ Feature engineering and/or Feature selection
- ➢ Various models and approaches taken
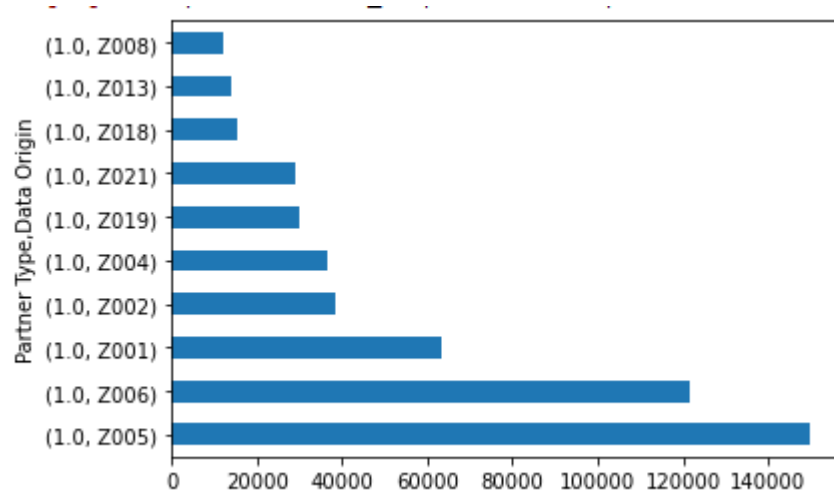- ➢ Tuning the model

Marketing Recommendation
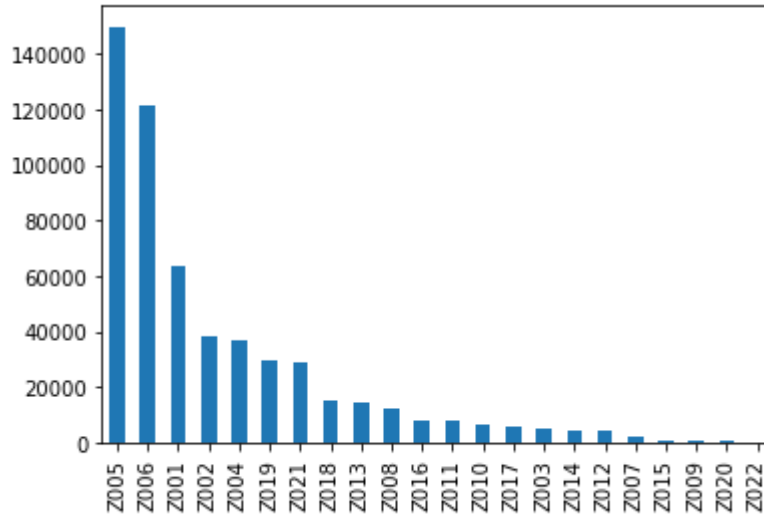
- Reference-customer(Z05) and reference-employee(Z06) are two major sources for marketing
- Also outdoor camps(Z01) are important from marketing point

Which marketing source is responsible in bringing which type of customer?

We can conclude that Reference-customer(Z05) and reference-employee(Z06) are two major sources for partner type i.e. Retail

Which marketing source brings the most business?
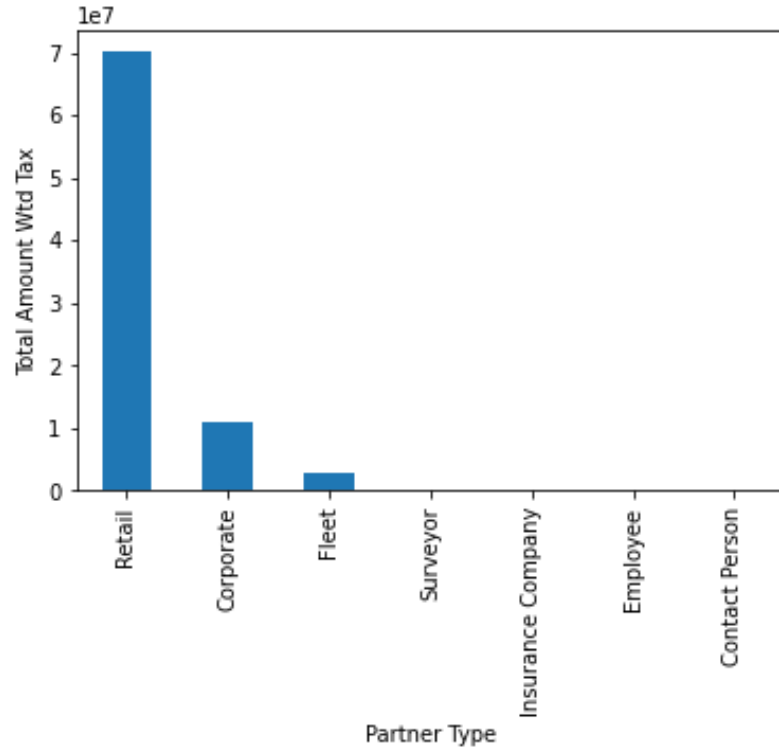
Retail and corporate are the major sources for most of the business

Final Outcome

➢We have divided car make on the basis of kilometer reading and which services and parts are often required so for such customers we can offer better services by maintaining inventory

➢We have performed RFM analysis (CLTV Prediction) and we have figured out the customers we are about to lose or lost we can concentrate on those customers as well we have to focus on champion and Loyal customers to gain more sales, optimize marketing expenses, increase customer retention and encourage brand loyalty

Additional things that can be added (optional)

- × What computing resources were used?
- × A short note on what it takes to deploy the model
- × API along with a web app

Thank You