Mahindra First Choice

Presented By
Karan Shinde
Tushar Dhongade
Haider Ali
Siddhant Benake

Business Problem

Geolocation Based Analysis:

>> Identifying the ownership pattern of cars throughout the country.

>> Find out how the different type of services and service time vary with location.

>> Analyse the revenue generated at different locations throughout the country

Market Segmentation:

>> Divide the customer base into different segments based on the activeness, number of visits to garage, service type and revenue generated .

>> This will help to better understand the customer behavioural patterns and have targeted marketing campaigns and rewards based on the segments

Customer Lifetime Value Prediction:

>> Predict the value given by the customer over his lifetime based on the average spend over a year and number of visits.

>> Analysing CLV would help Mahindra First Choice focus on the customers who are going to generate good value to the company.

>> Lifetime value of the customer is a metric that represents the total amount of a money a customer is expected to spend over the lifetime of the car.

Data In Hand

There are 4 datasets namely Customer,Invoice,

JTD and Plant master.
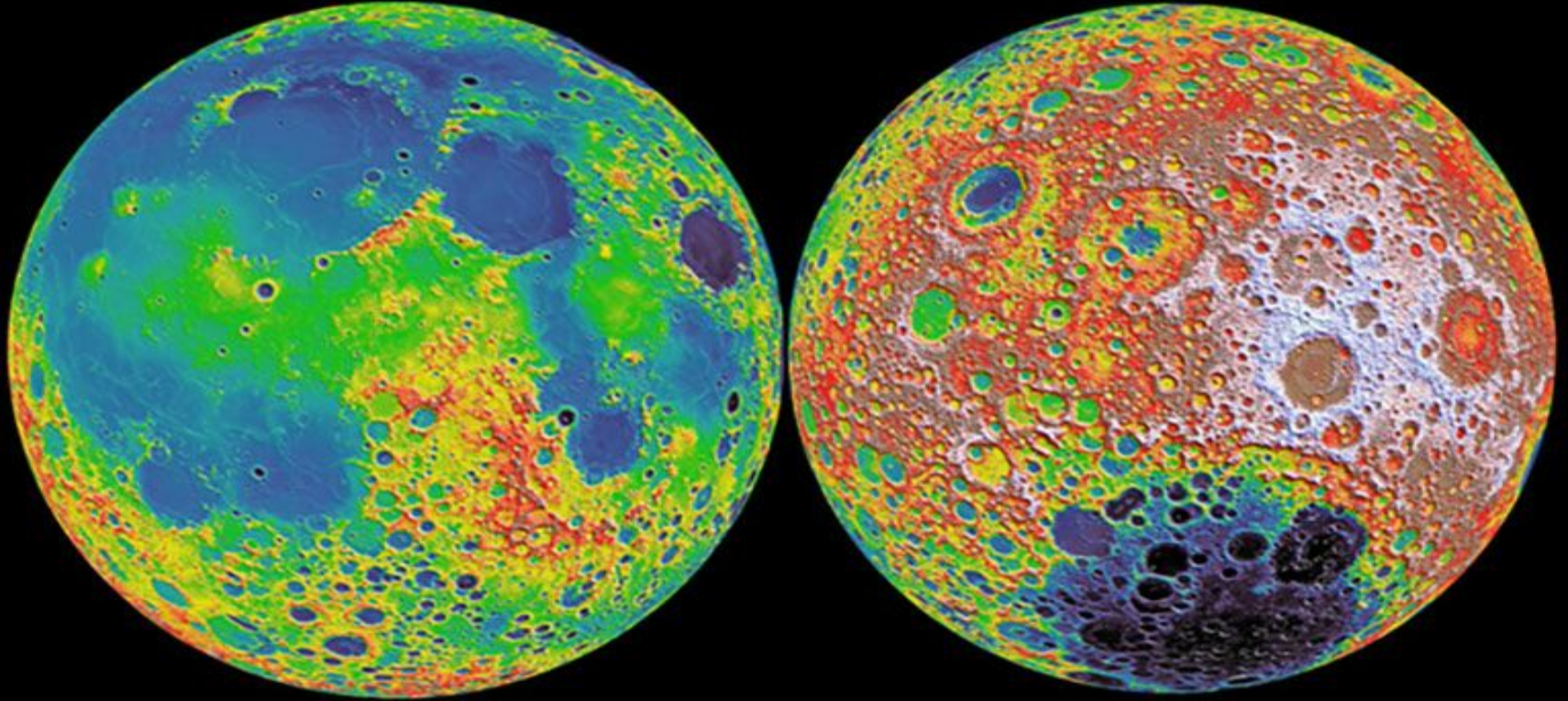
❑ Customer csv: 5,55,338 rows and 9 columns.
❑ Invoice csv: 4,92,314 rows and 59 columns.
❑ Jtd csv: 5619484 rows and 10 columns.
❑ Plant csv: 483 rows and 13 columns.

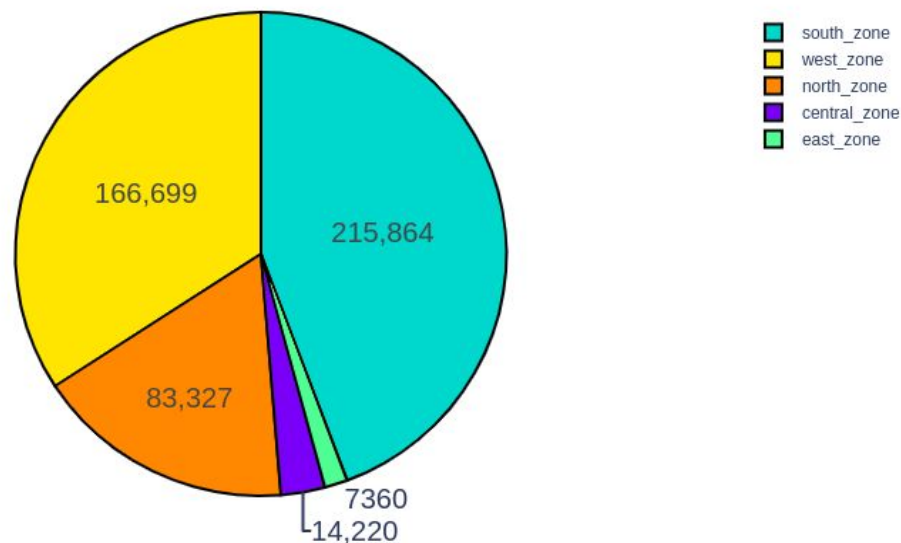# Exploratory Data Analysis

Geological Based Customer Analysis

Make counts according to Zones.

south_state=Karnataka','Tamil Nadu','Andhra Pradesh','Telangana','Kerala','Puducherry','Lakshadweep','Andaman and Nico.In.'
west_state=Maharashtra','Gujarat','Dadra and Nagar.','Daman and Diu','Goa','Rajasthan']
north_state=Uttar Pradesh','Delhi','Himachal Pradesh','Punjab','Uttarakhand','Haryana','Jammu and Kashmir']
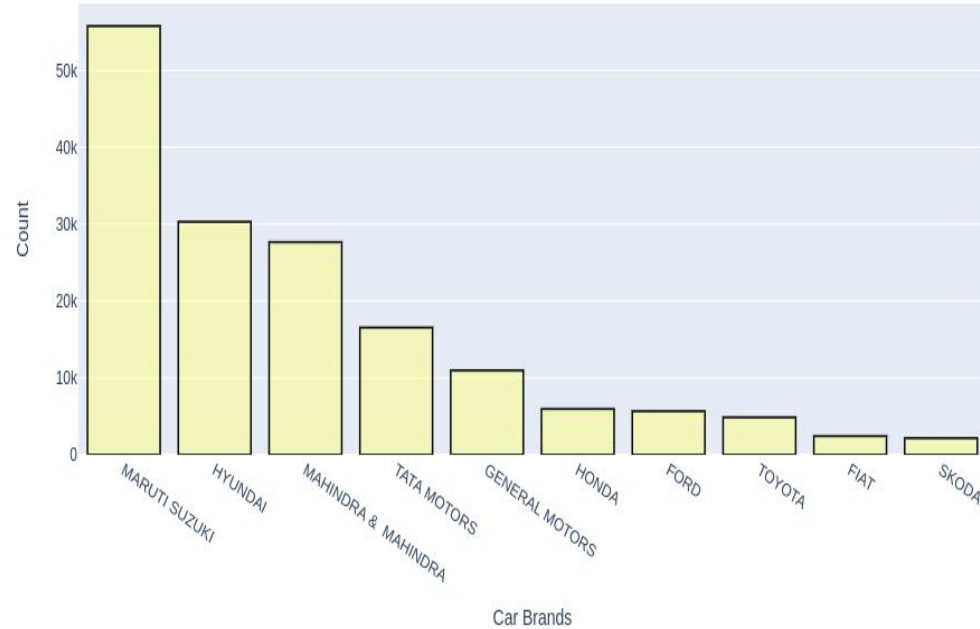central_state=Madhya Pradesh','Chhattisgarh']
east_state=West Bengal','Odisha','Bihar','Jharkhand','Arunachal
Pradesh','Assam','Manipur','Meghalaya','Mizoram','Nagaland','Sikkim','Tripura']

West and South Zone wise count according Make (Car Brands).
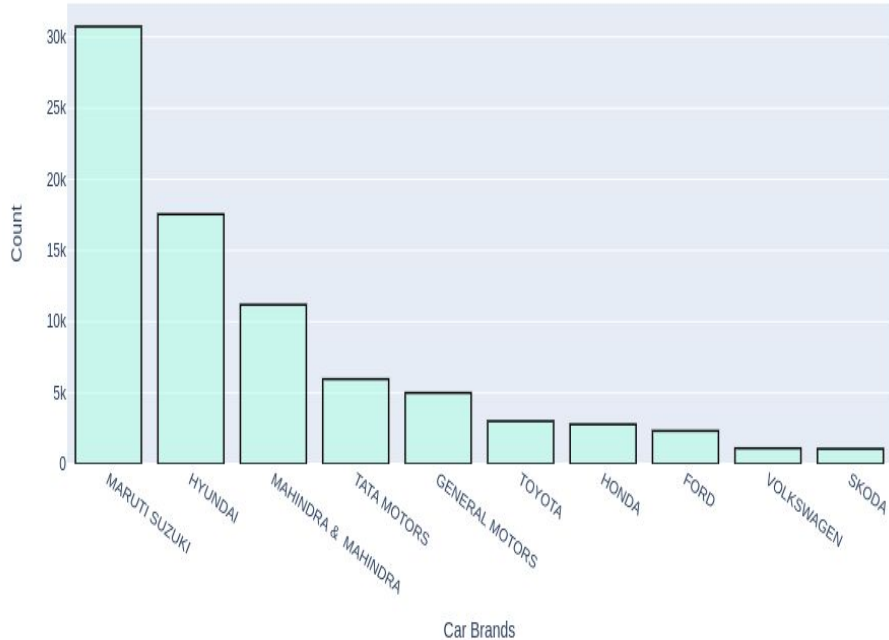

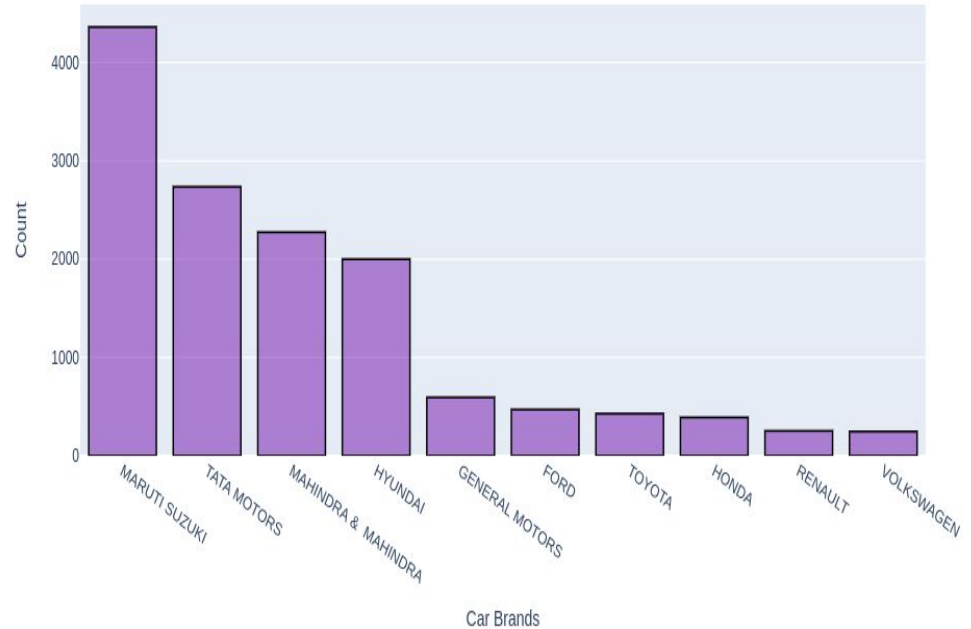Car brands in South Zone
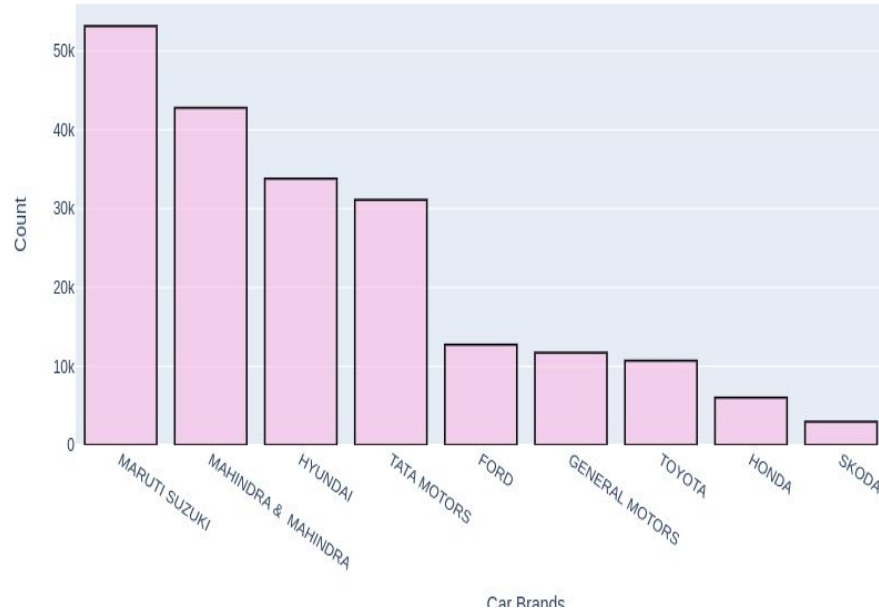
Car brands in West Zone

North and Central Zone wise count according Make (Car Brands).
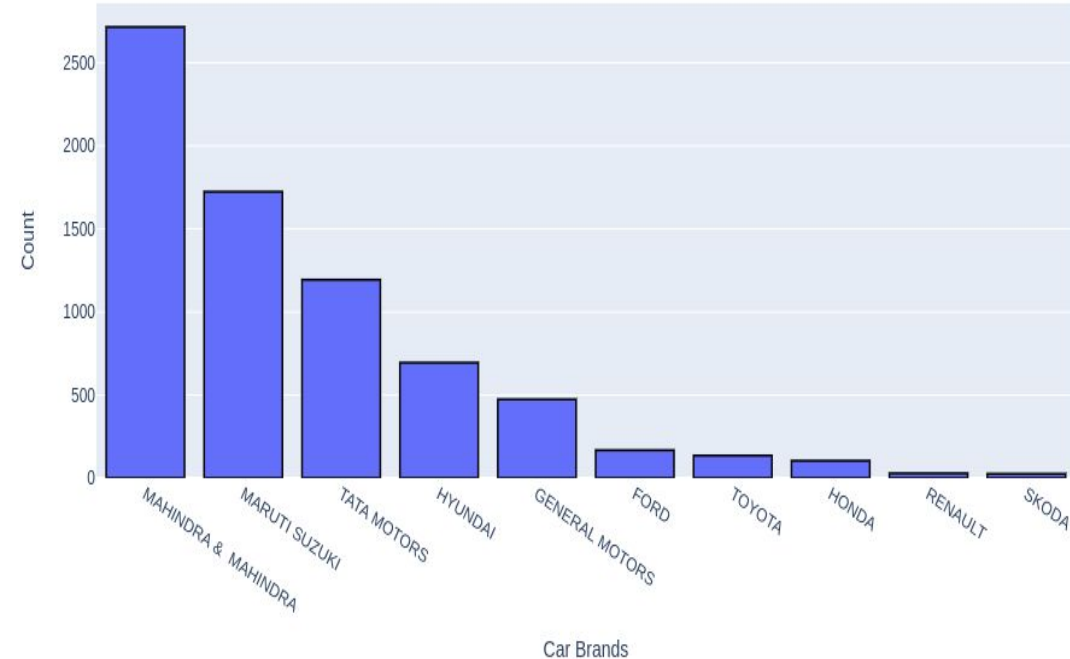

Car brands in North Zone

Car brands in Central Zone

East Zone wise popular make.

Car brands in East Zone

South zone   maruti suzuki/mahindra

West zone   maruti suzuki/hyundai

North zone   maruti suzuki/hyundai

Central   maruti suzuki/tata motors

East zone   mahindra/maruti suzuki

Service structure for top 10 Make (Car Models)

Order_Type Make	Accidental	Mechanical	Paid Service	Running Repairs	SMC Redemption
FORD	2196	654	5426	12009	398
GENERAL MOTORS	2316	853	7687	15519	1079
HONDA	2067	386	3790	7843	559
HYUNDAI	7698	2396	22453	43553	4393
MAHINDRA & MAHINDRA	6697	2771	24958	47070	1863
MARUTI SUZUKI	11548	4332	39727	78821	5222
TATA MOTORS	4195	1745	14745	33520	1354
TOYOTA	2748	643	4019	10768	416

Popular service for top 5 state

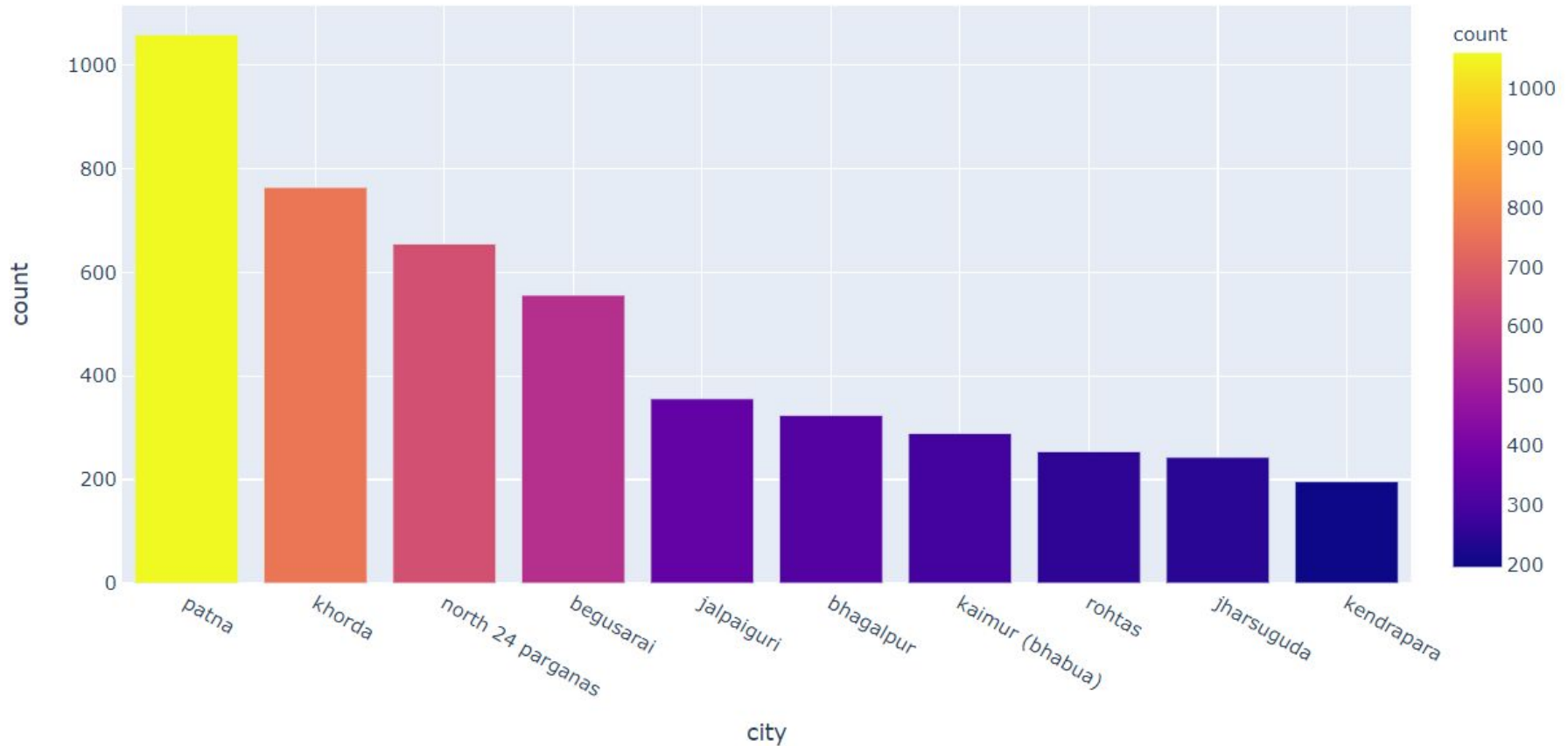| Order Type	District
Running Repairs	Tamil Nadu
Paid Service	Karnataka
Accidental	
SMC Redemption	Maharashtra
Mechanical	Telangana
SMC Value Package	
Repeat Order	Uttar Pradesh
WBW Order	Punjab
Workshop Damage	

Top 10 cities with most cars (Models) in North zone
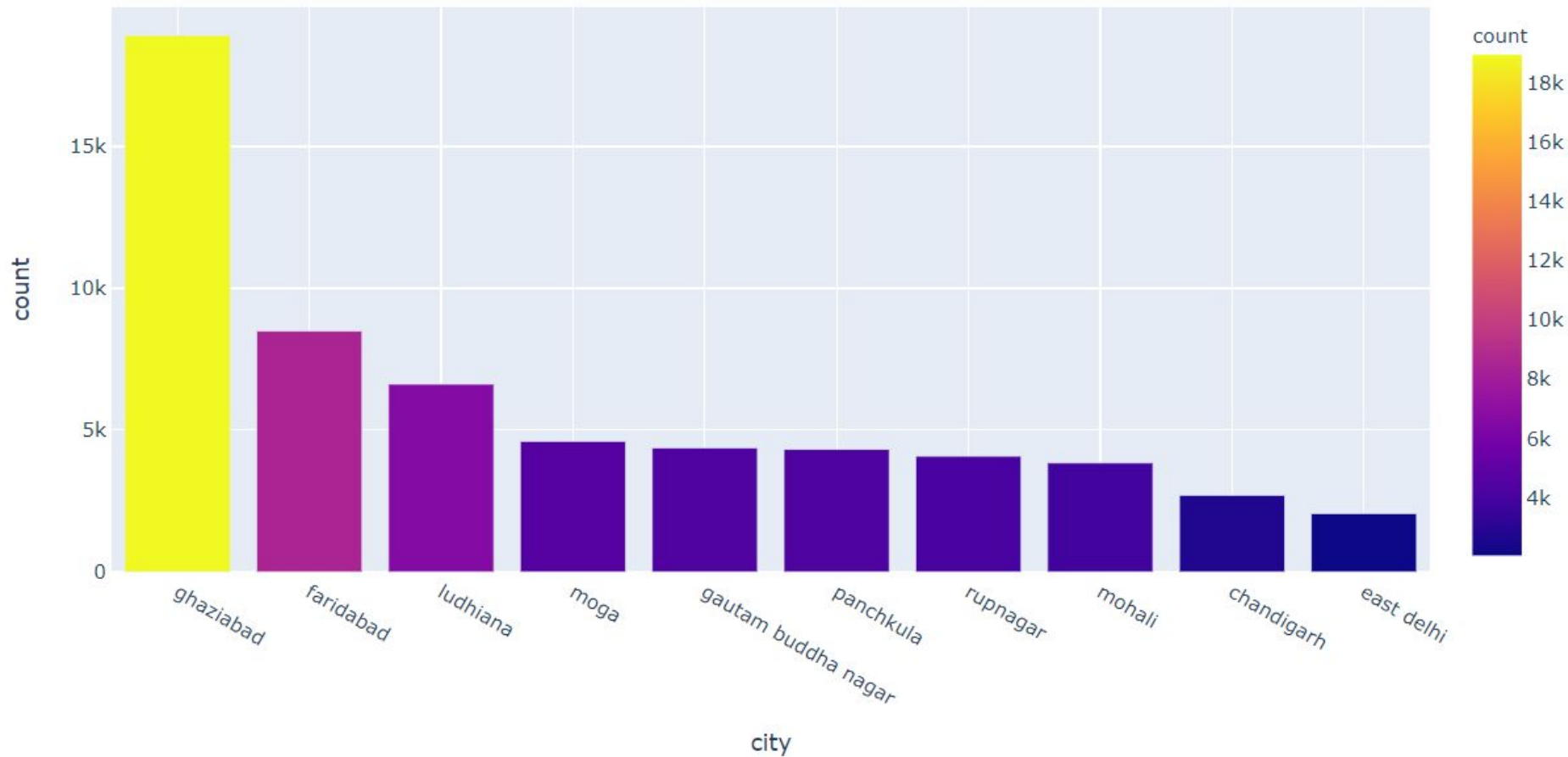
Top 10 cities with most cars (Models) in West zone
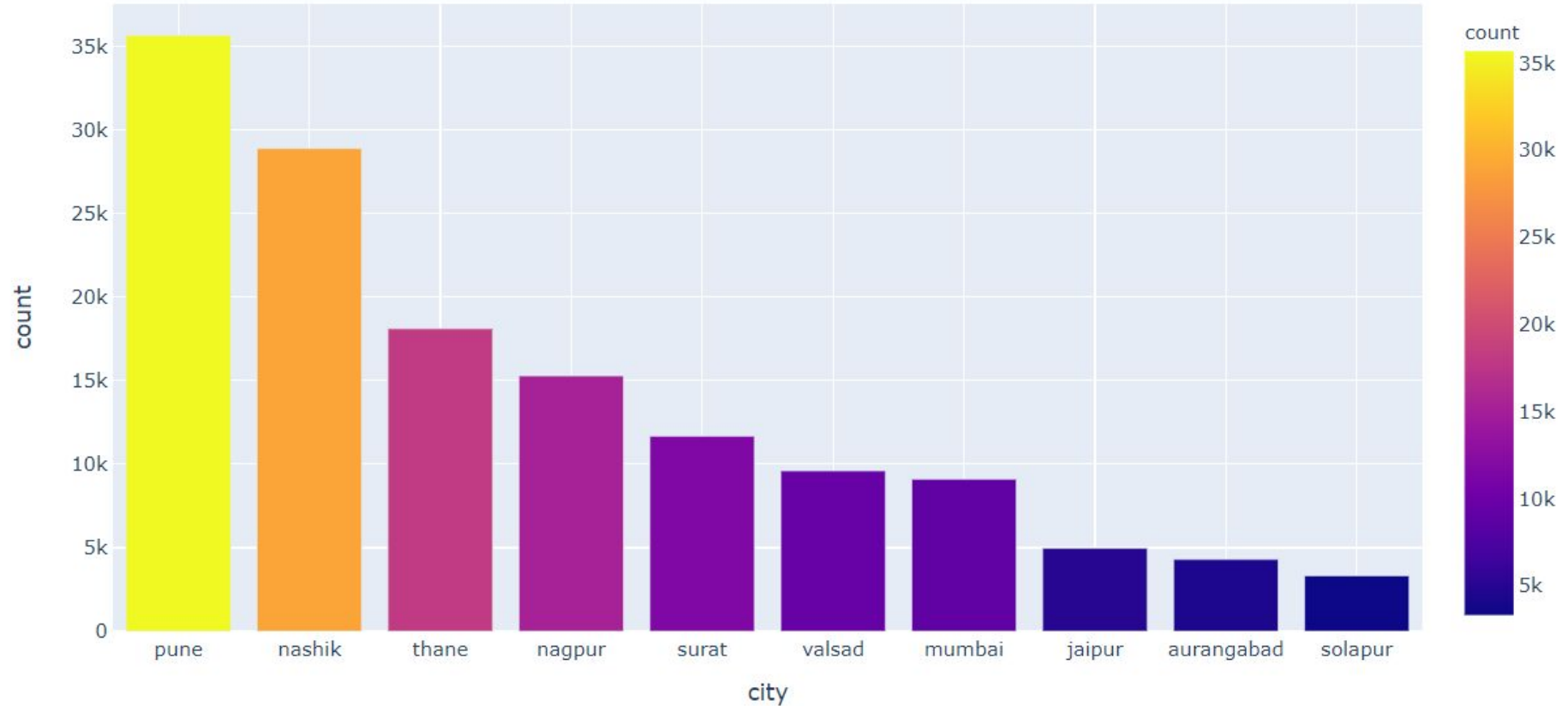
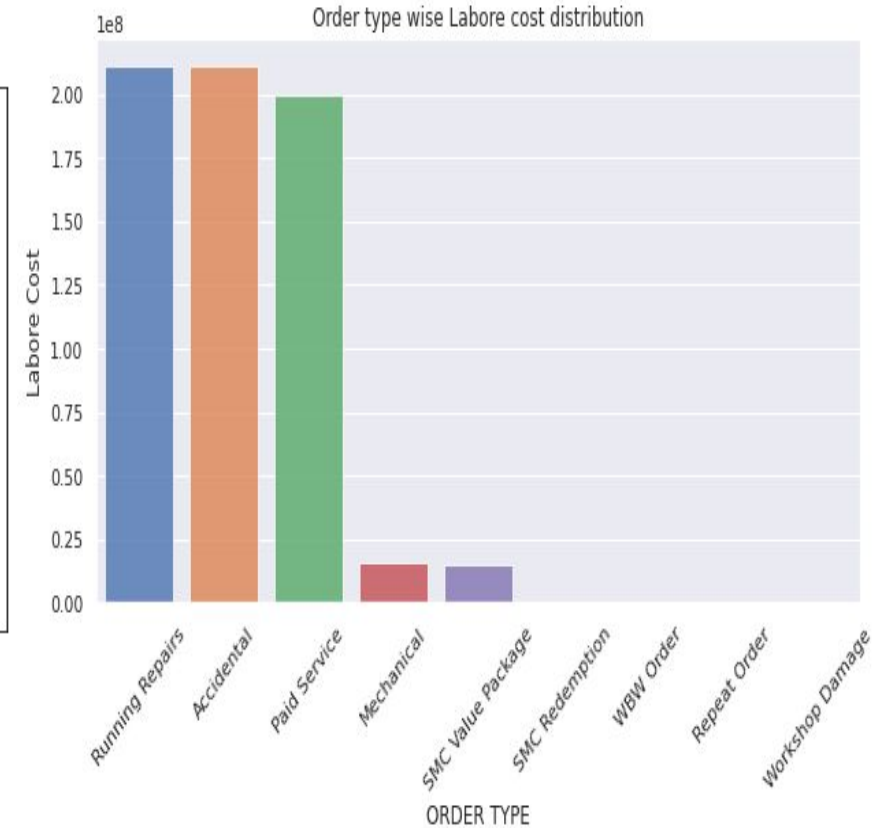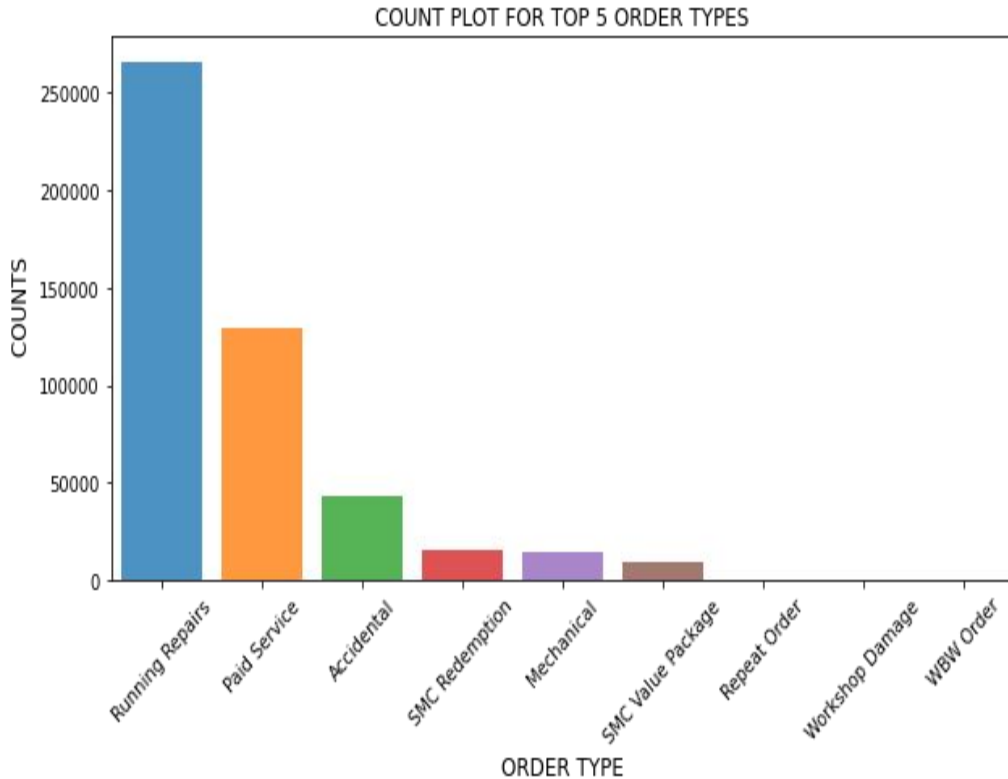# Top 10 cities with most cars (Models) in East zone

Top 10 cities with most cars(Models) in South zone
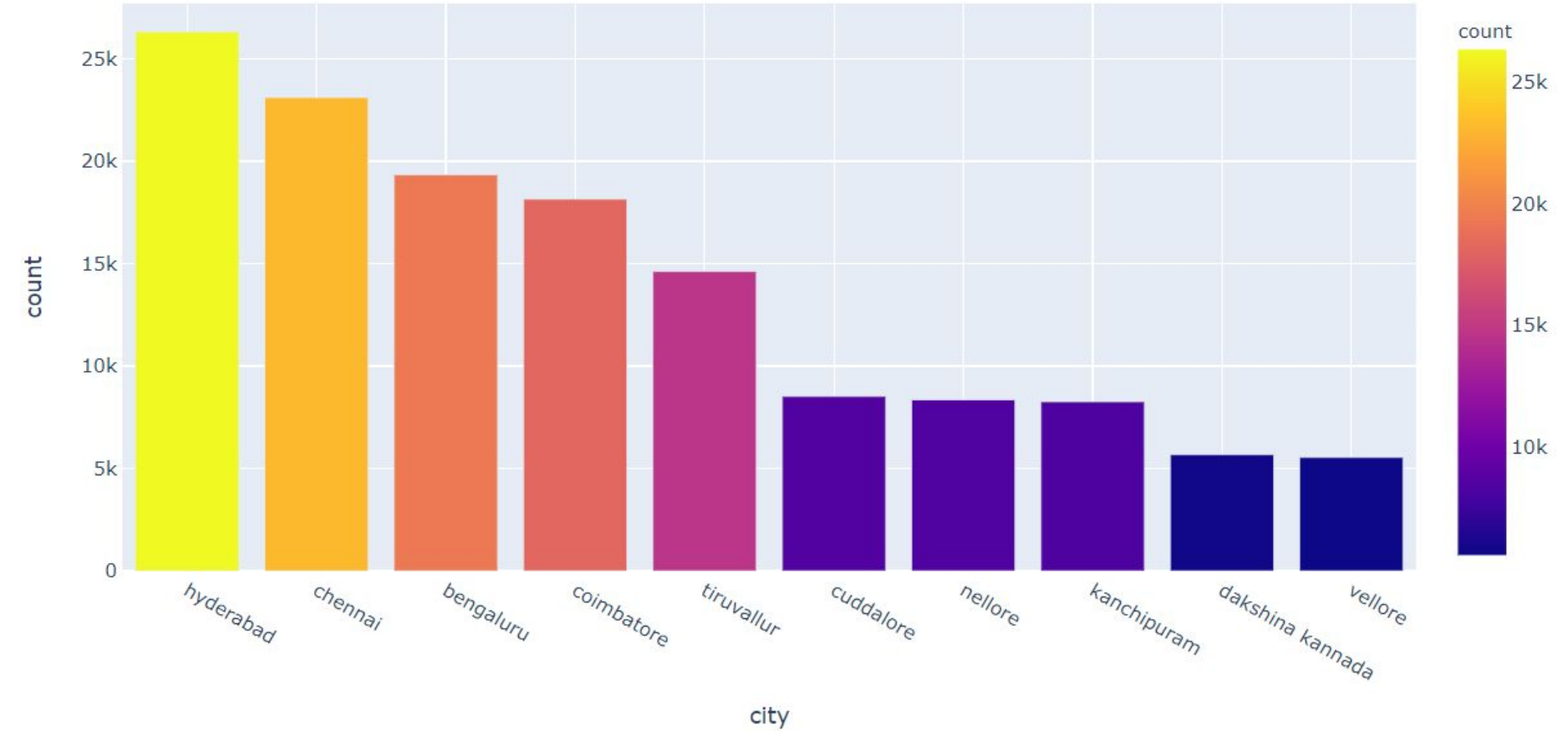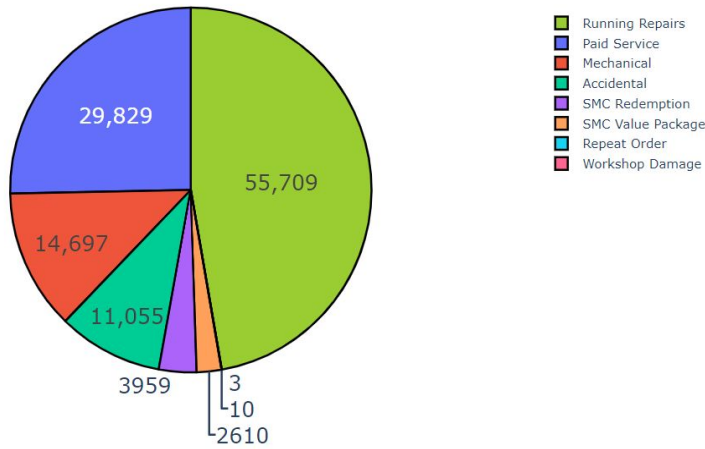
Top 10 cities with most cars(Models) in Central zone
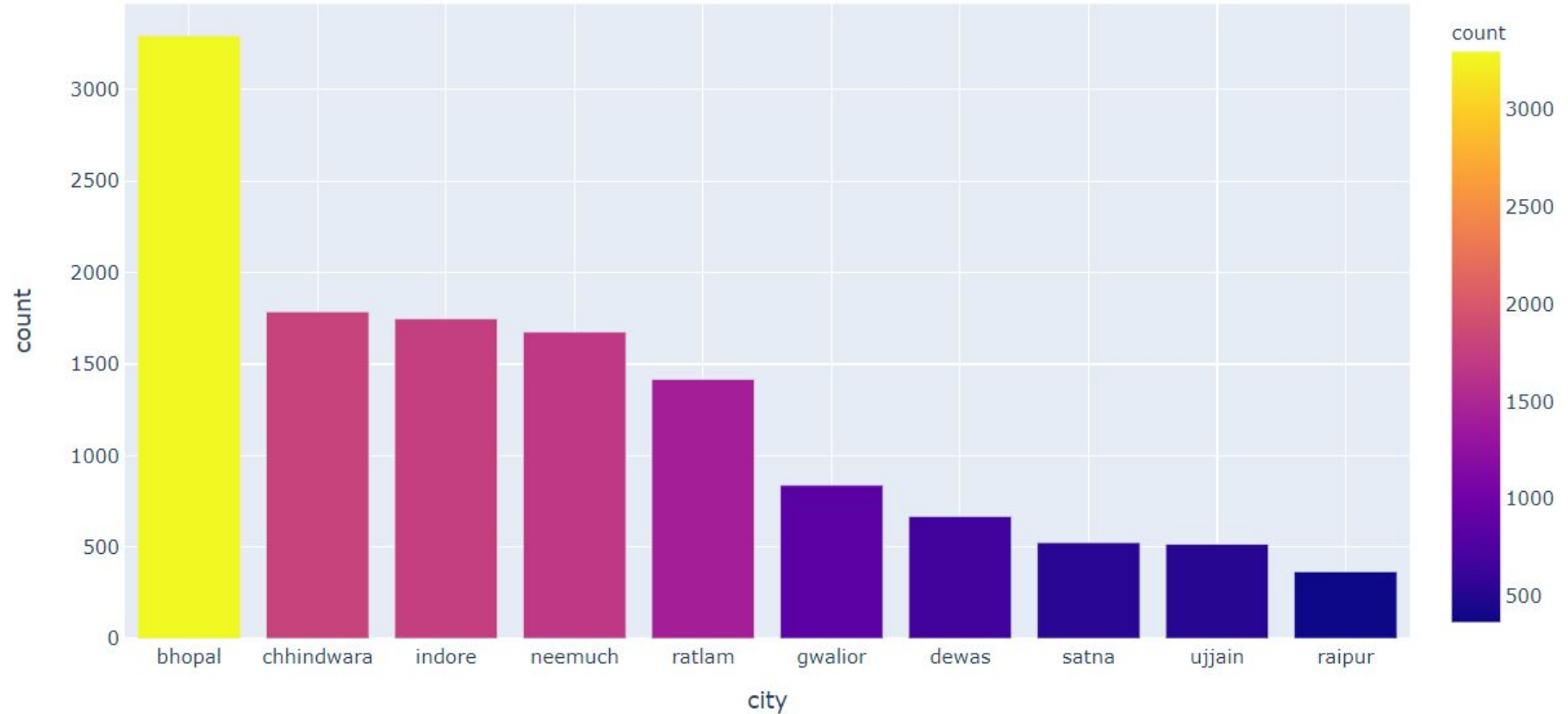
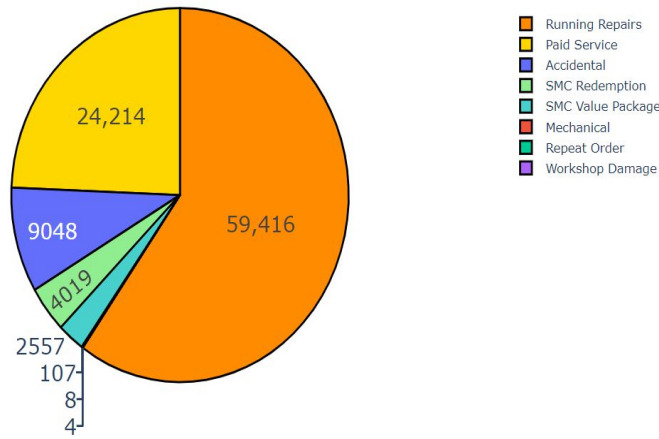# Different Types of services   & there labour cost
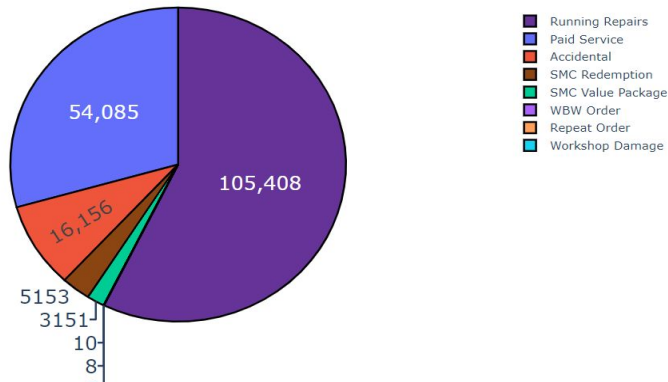
seasonal trend in orders

Summer Season Orders

- Running Repairs
- Paid Service
- Mechanical
- Accidental
- SMC Redemption
- SMC Value Package
- Repeat Order
- Workshop Damage

55,709
29,829
14,697
11,055
3959
3
10
2610

Winter Season Orders

- Running Repairs
- Paid Service
- Accidental
- SMC Redemption
- SMC Value Package
- Mechanical
- Repeat Order
- Workshop Damage

59,416
24,214
9048
4019
2557
107
8
4

Monsoon Season Orders

- Running Repairs
- Paid Service
- Accidental
- SMC Redemption
- SMC Value Package
- WBW Order
- Repeat Order
- Workshop Damage

105,408
54,085
16,156
5153
3151
10
8

Autumn Season Orders

- Running Repairs
- Paid Service
- Accidental
- SMC Redemption
- SMC Value Package
- WBW Order
- Mechanical
- Workshop Damage
- Repeat Order

44,832
21,224
6784
2472
1375
6
5
3

Seasonal Plot For Service
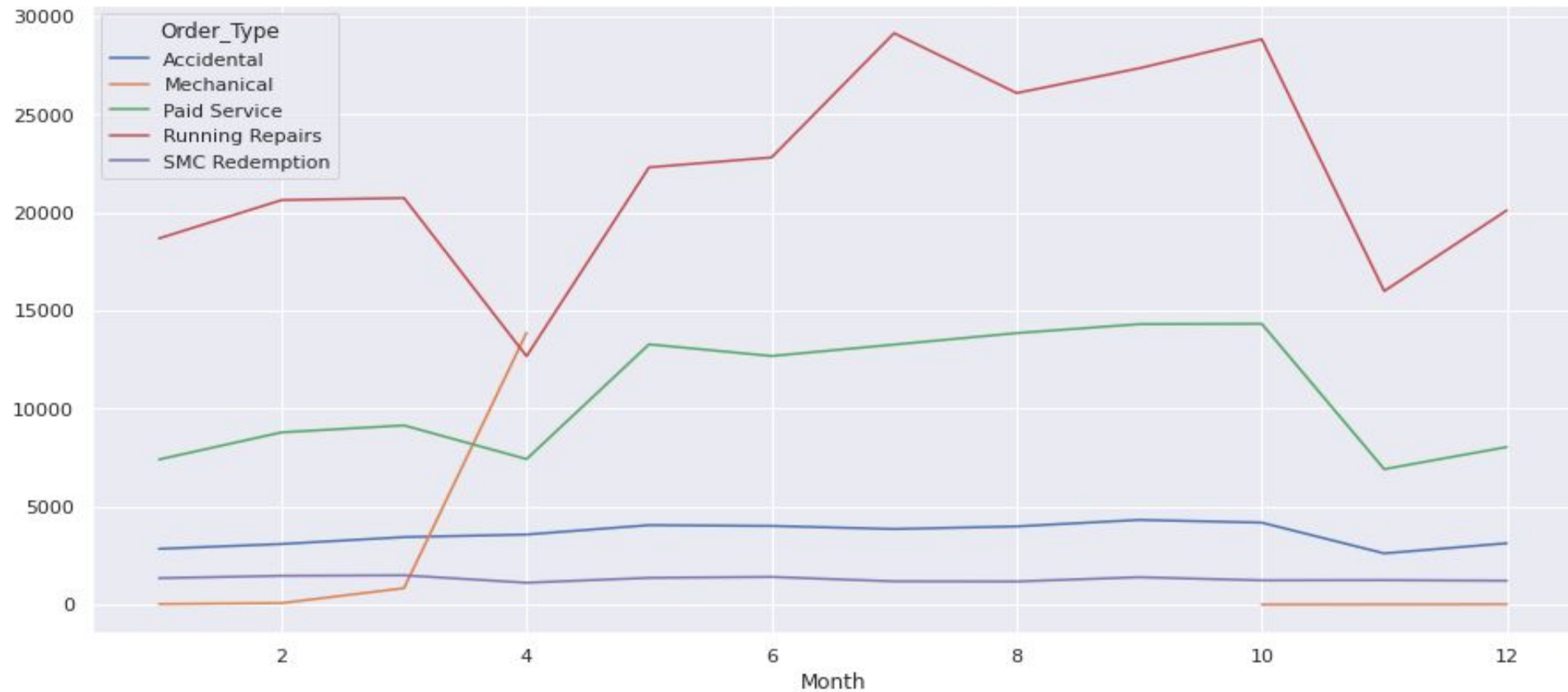
Popular service for top 10 make

Order_Type Make	Accidental	Mechanical	Paid Service	Running Repairs	SMC Redemption
FORD	2196	654	5426	12009	398
GENERAL MOTORS	2316	853	7687	15519	1079
HONDA	2067	386	3790	7843	559
HYUNDAI	7698	2396	22453	43553	4393
MAHINDRA & MAHINDRA	6697	2771	24958	47070	1863
MARUTI SUZUKI	11548	4332	39727	78821	5222
TATA MOTORS	4195	1745	14745	33520	1354
TOYOTA	2748	643	4019	10768	416

Market Segmentation

Data Preprocessing

1. Dropped columns
2. Clean state and city names
3. Treated null values in model, data origin and Partner type column
4. Bucketed states in zones
5. Created year, month and season features
6. Calculated total service hours

Customer Segmentation based on Avg revenue

0.05 quantile :- 150.25 Rs.
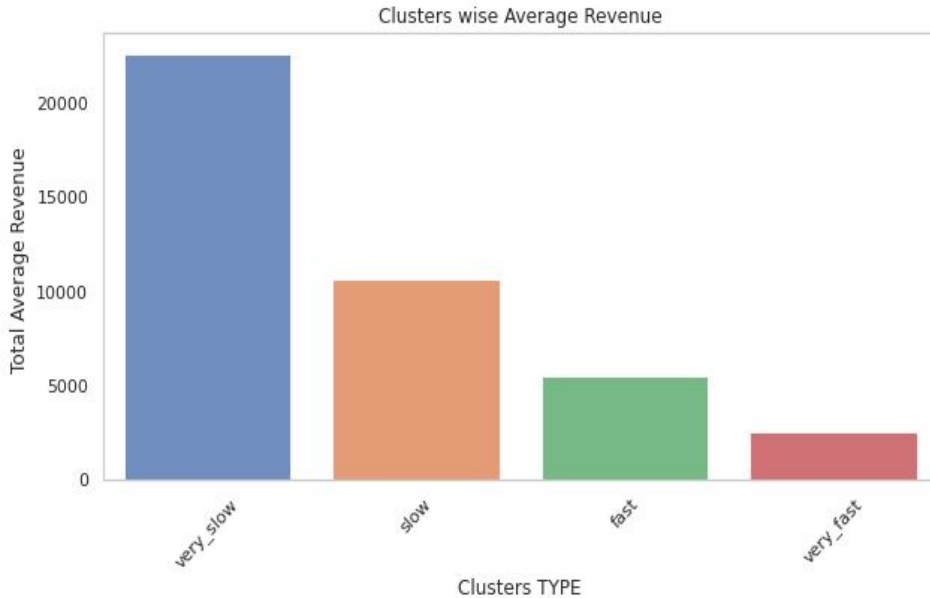0.25 quantile :- 774.72 Rs.
0.50 quantile :- 2714.98 Rs.
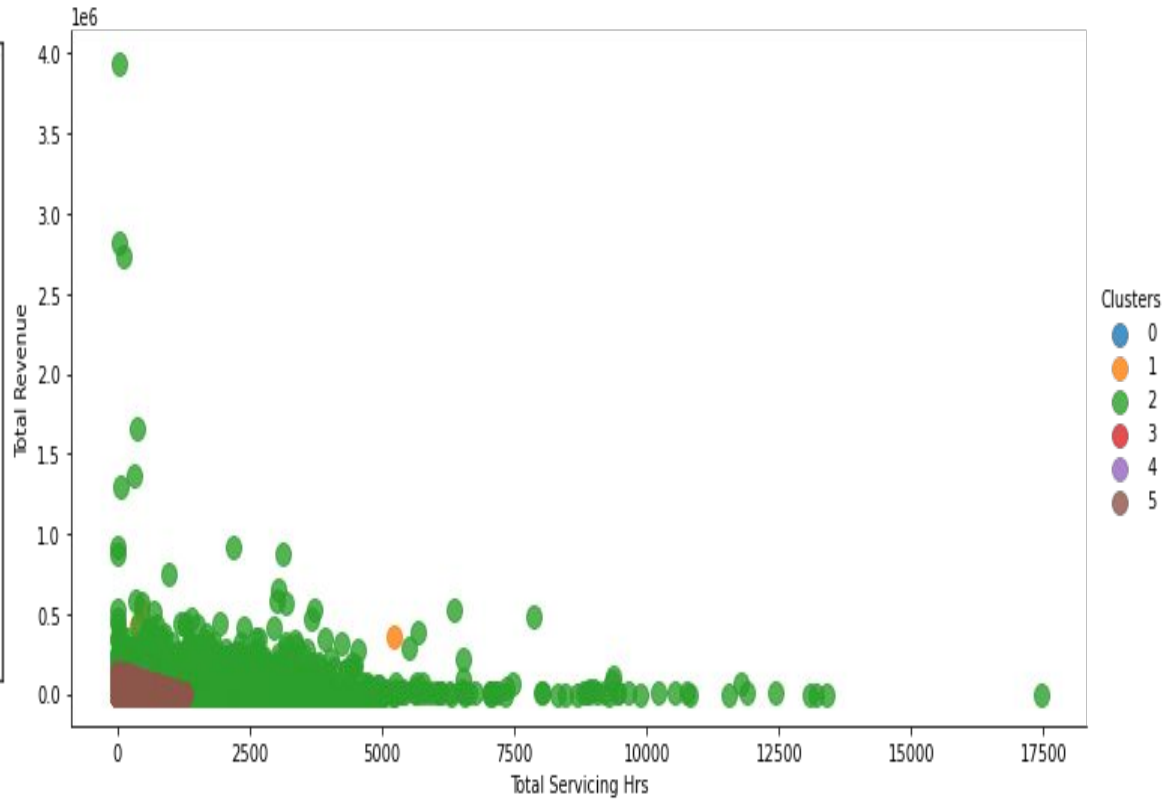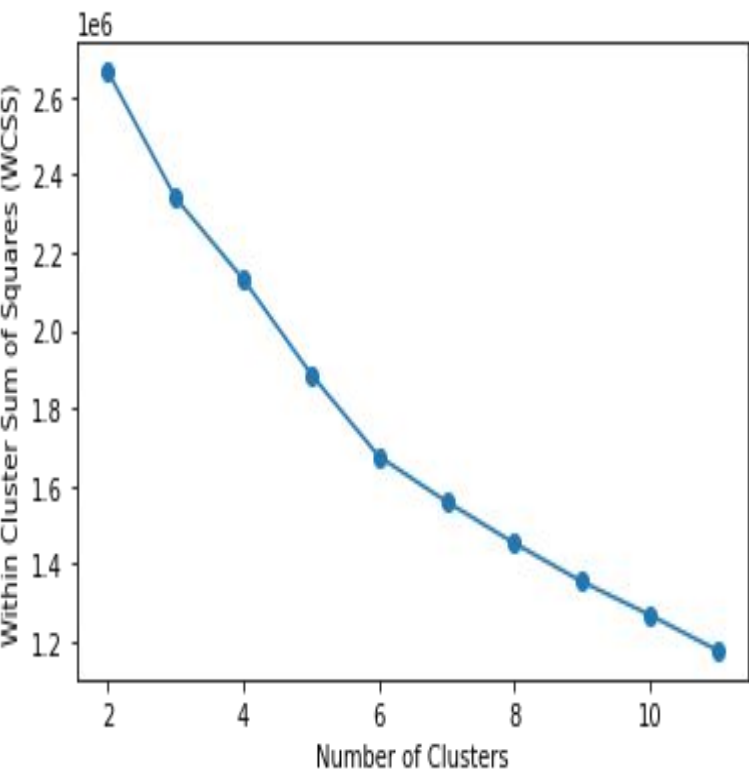0.75 quantile :- 5734.360000000001 Rs.
0.95 quantile :- 21447.675999999992 Rs.
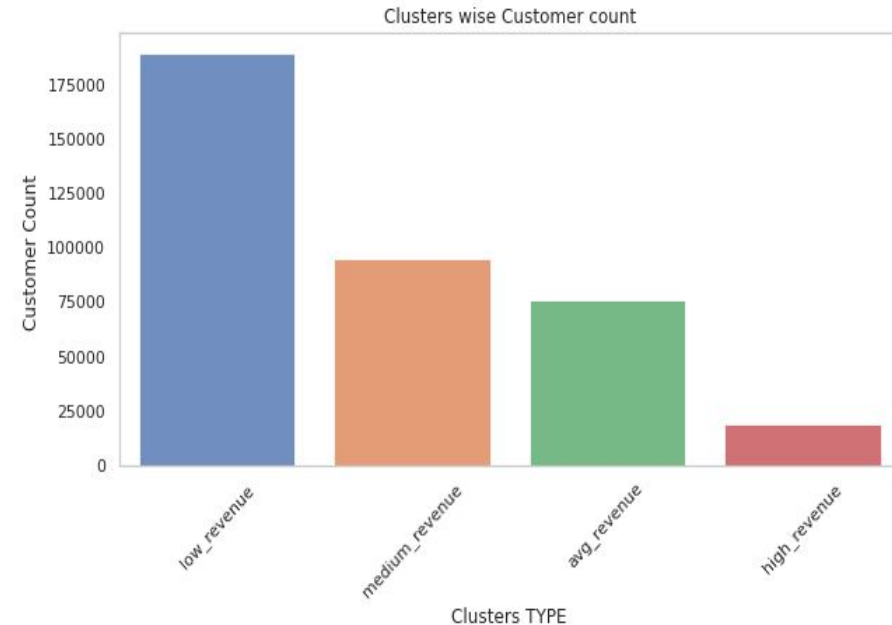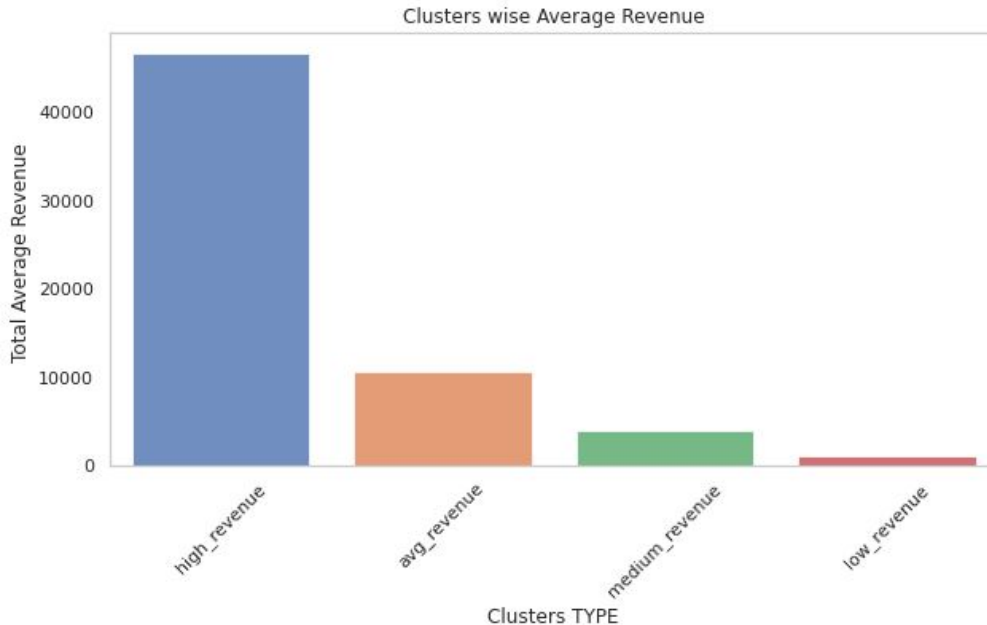
Customer Segmentation based on Avg servicing time

0.05 quantile :- 0.0 hrs
0.25 quantile :- 3.0 hrs
0.50 quantile :- 17.5 hrs
0.75 quantile :- 67.0 hrs
0.95 quantile :- 362.0 hrs

K-Means Clustering

Customer Lifetime Value

Lifetime value of the customer is a metric that represents the total amount of a money a customer is expected to spend over the lifetime of the car.
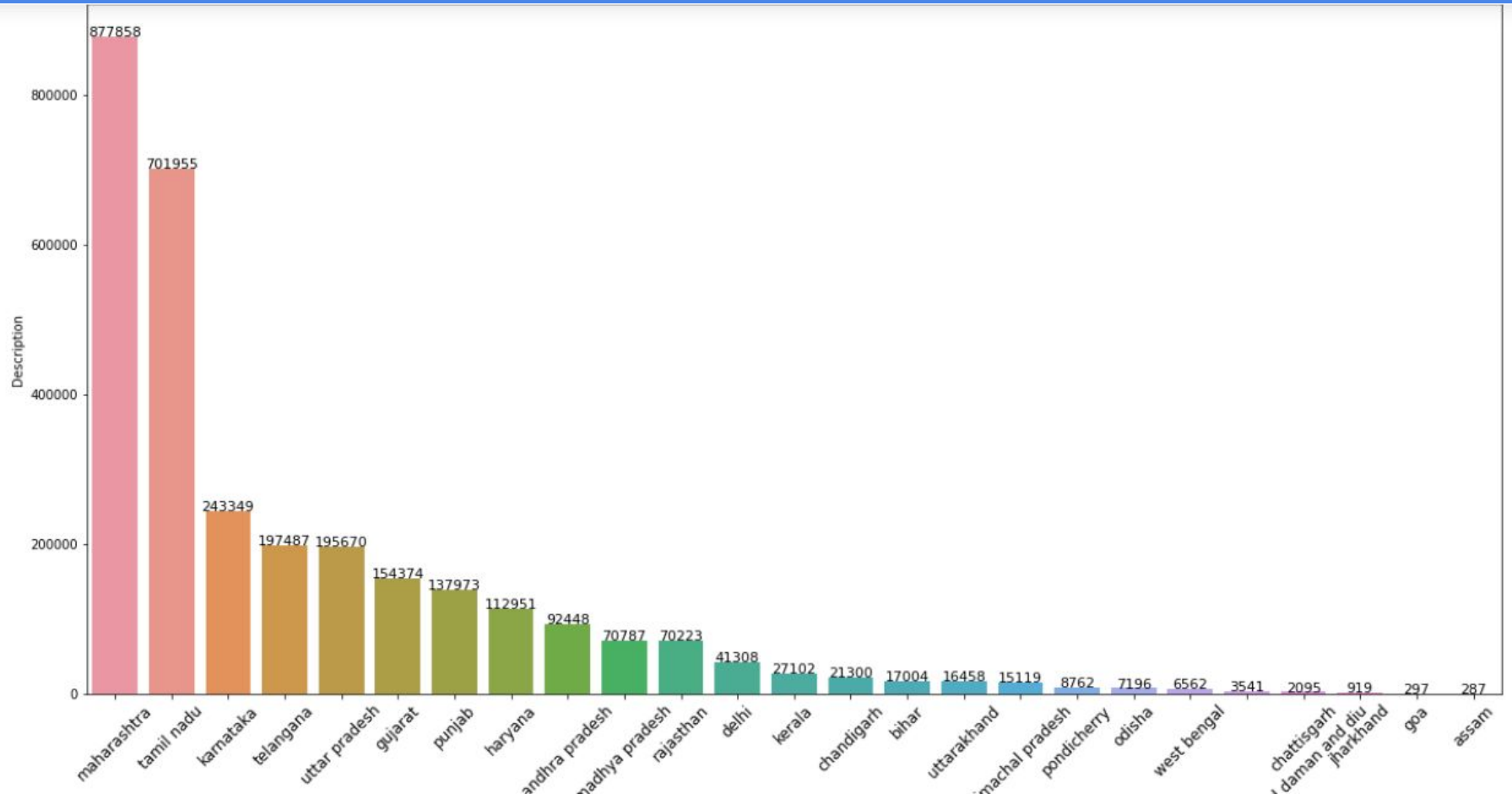
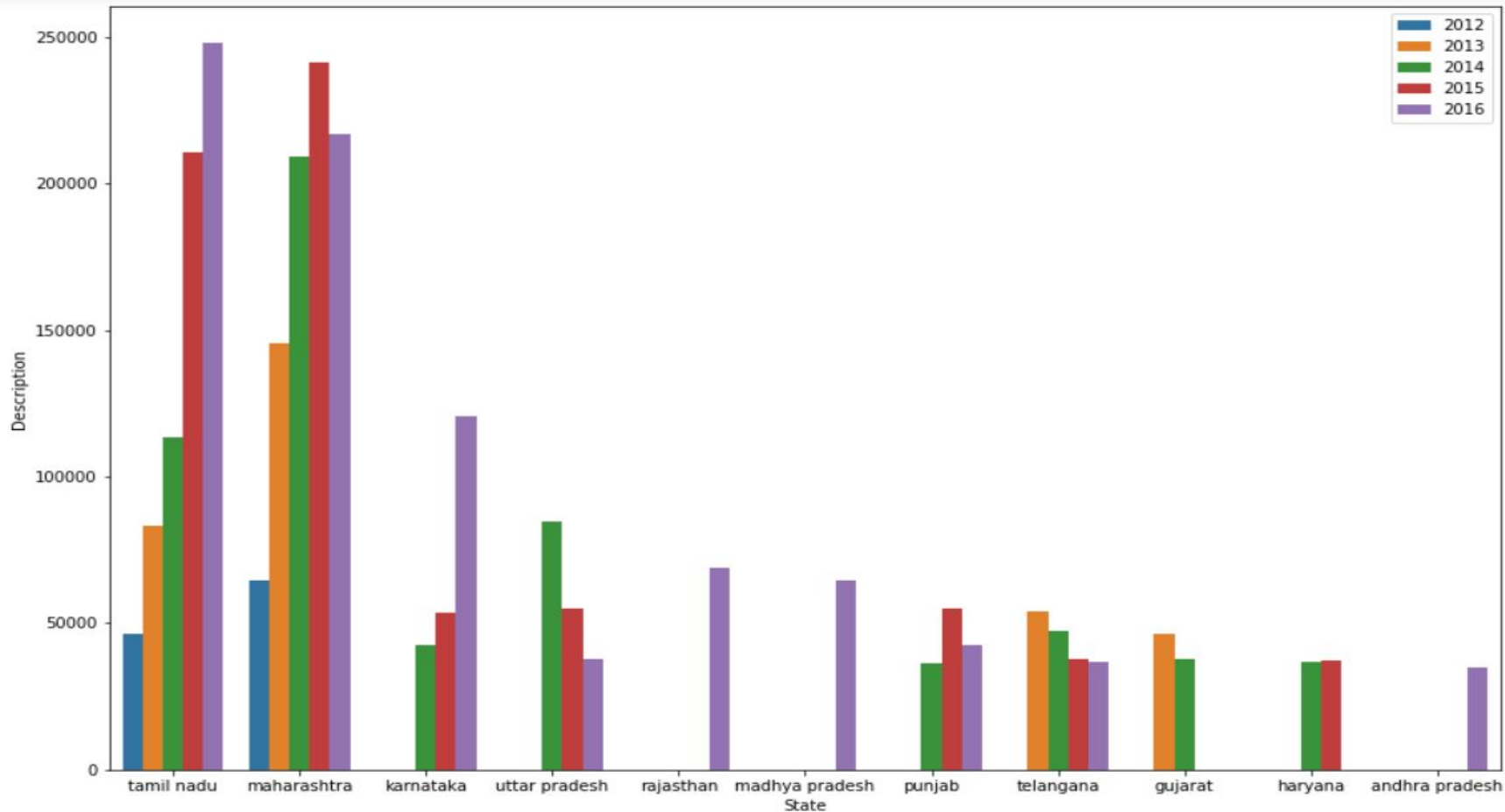We have calculated Avg. Customer LTV for the year 2016.
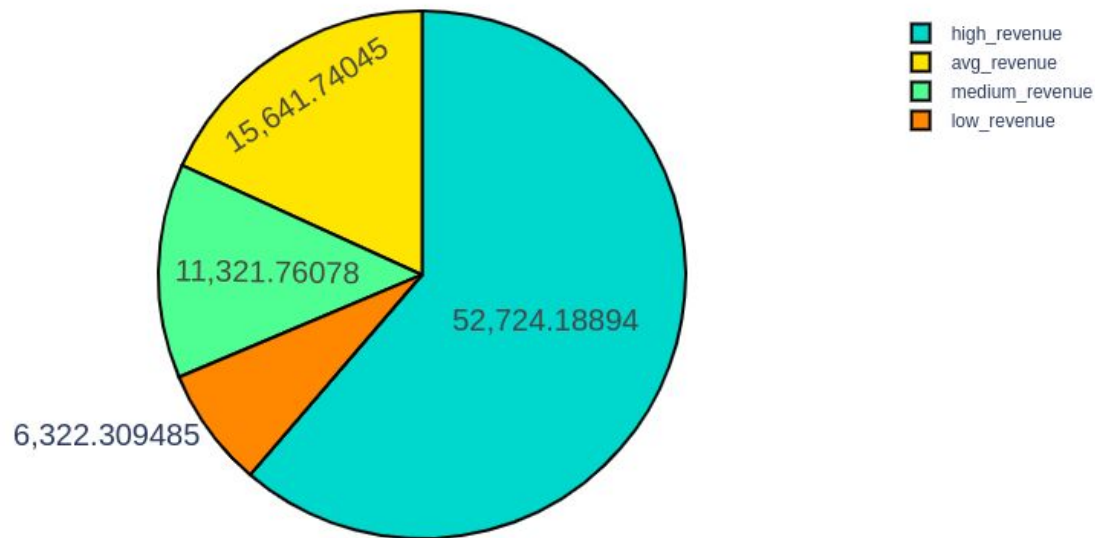
Inventory Management.

Most inventory items used as per cities (Top 25)
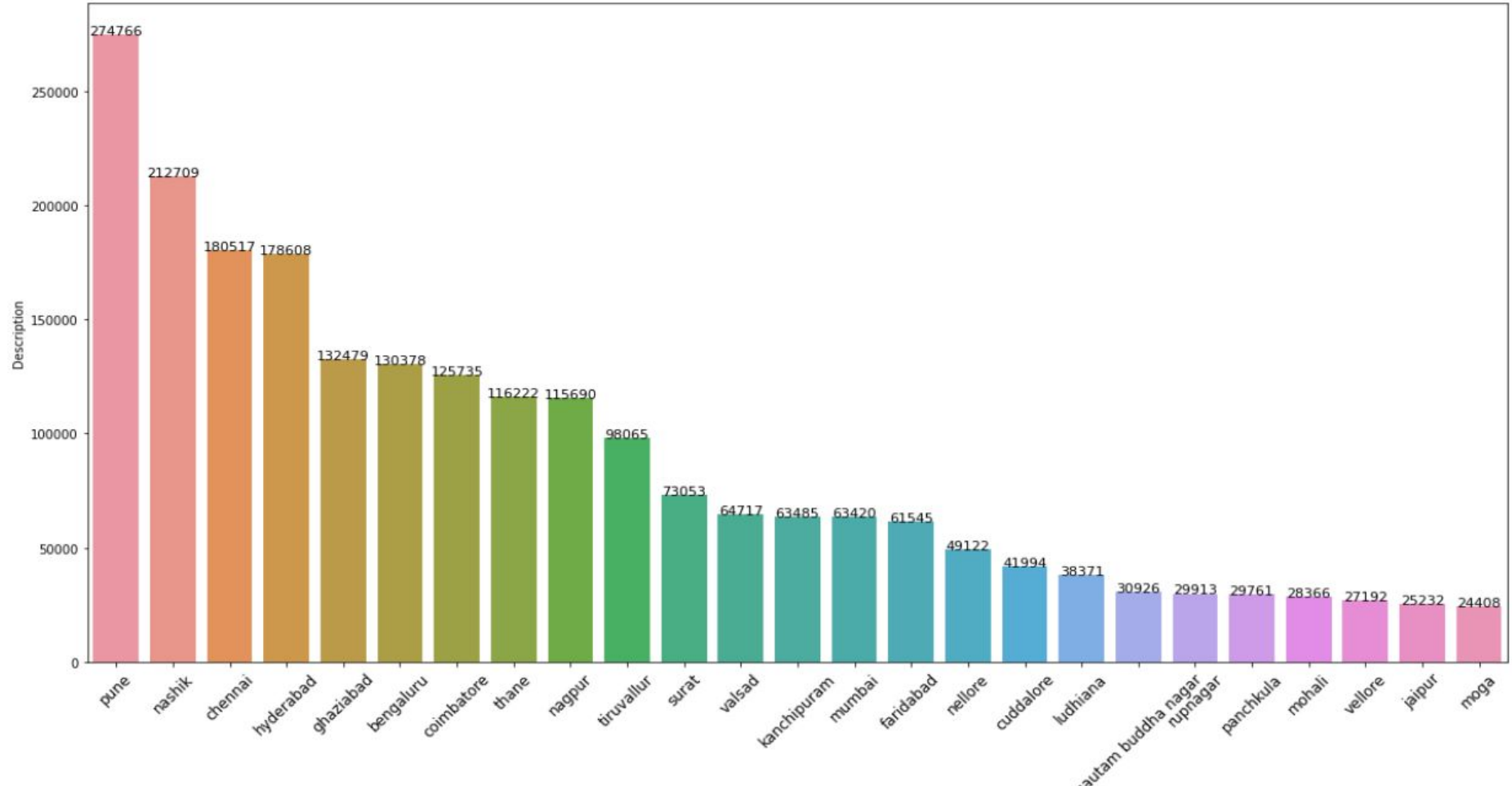
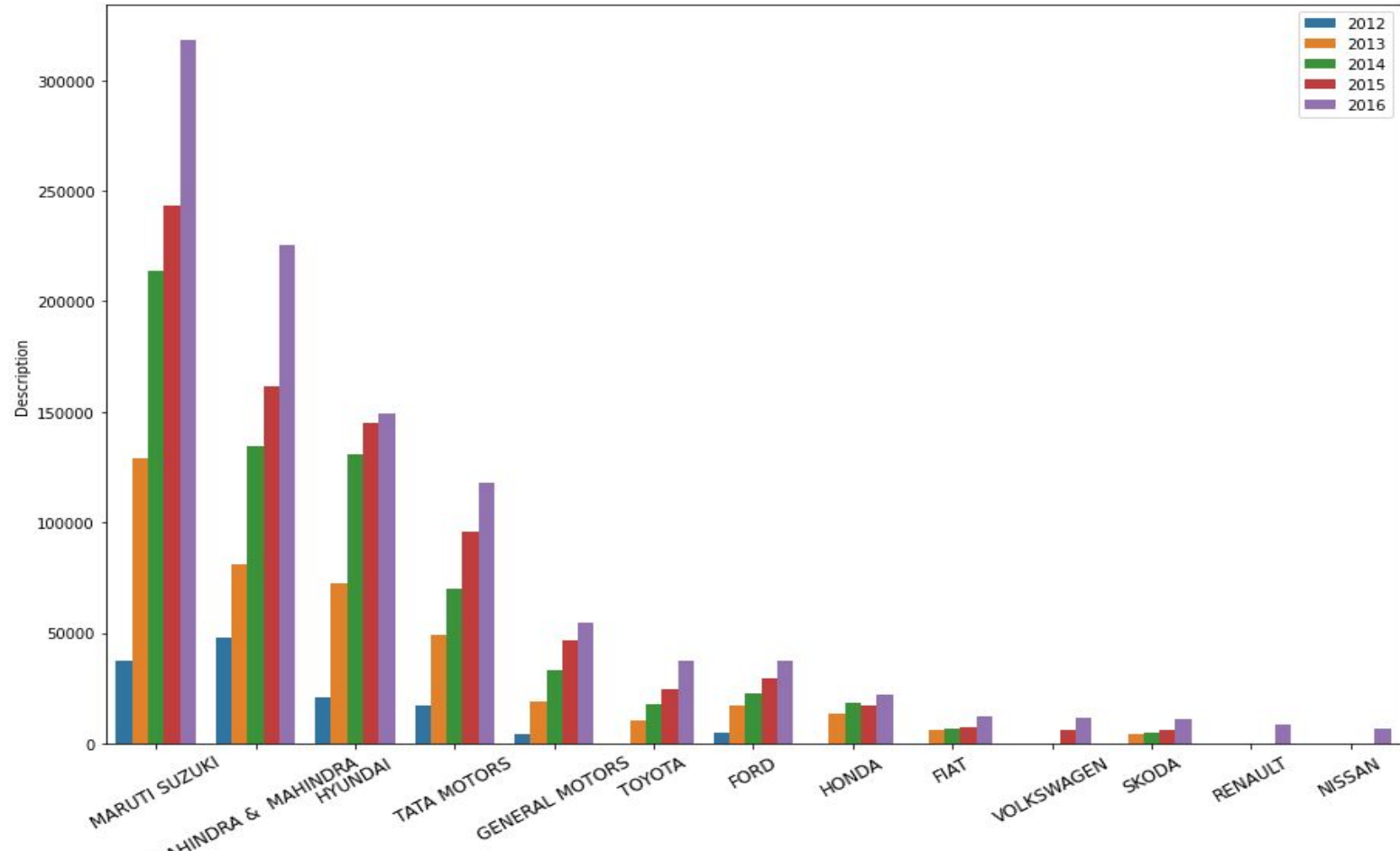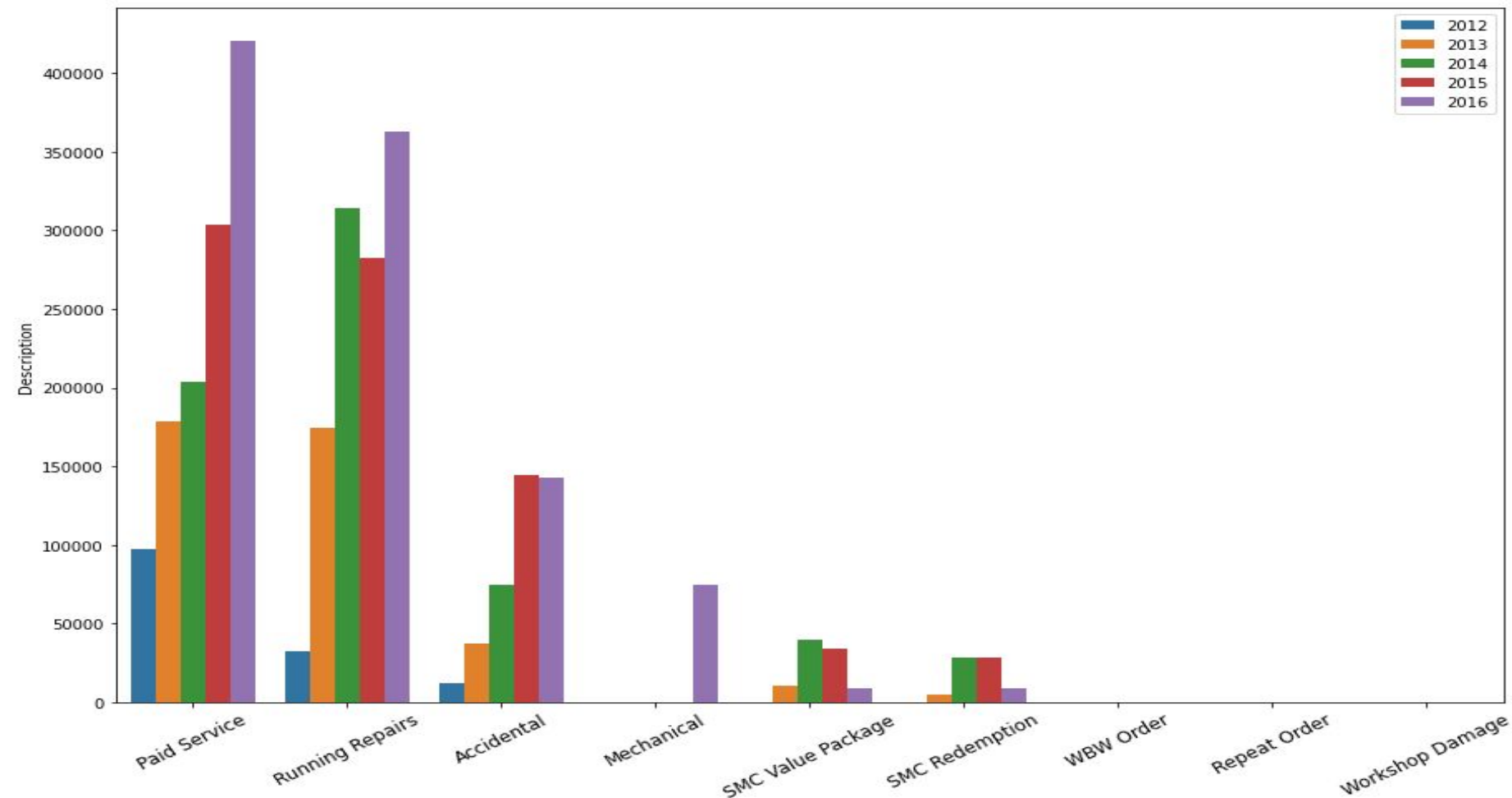# Frequency of inventory used as per states

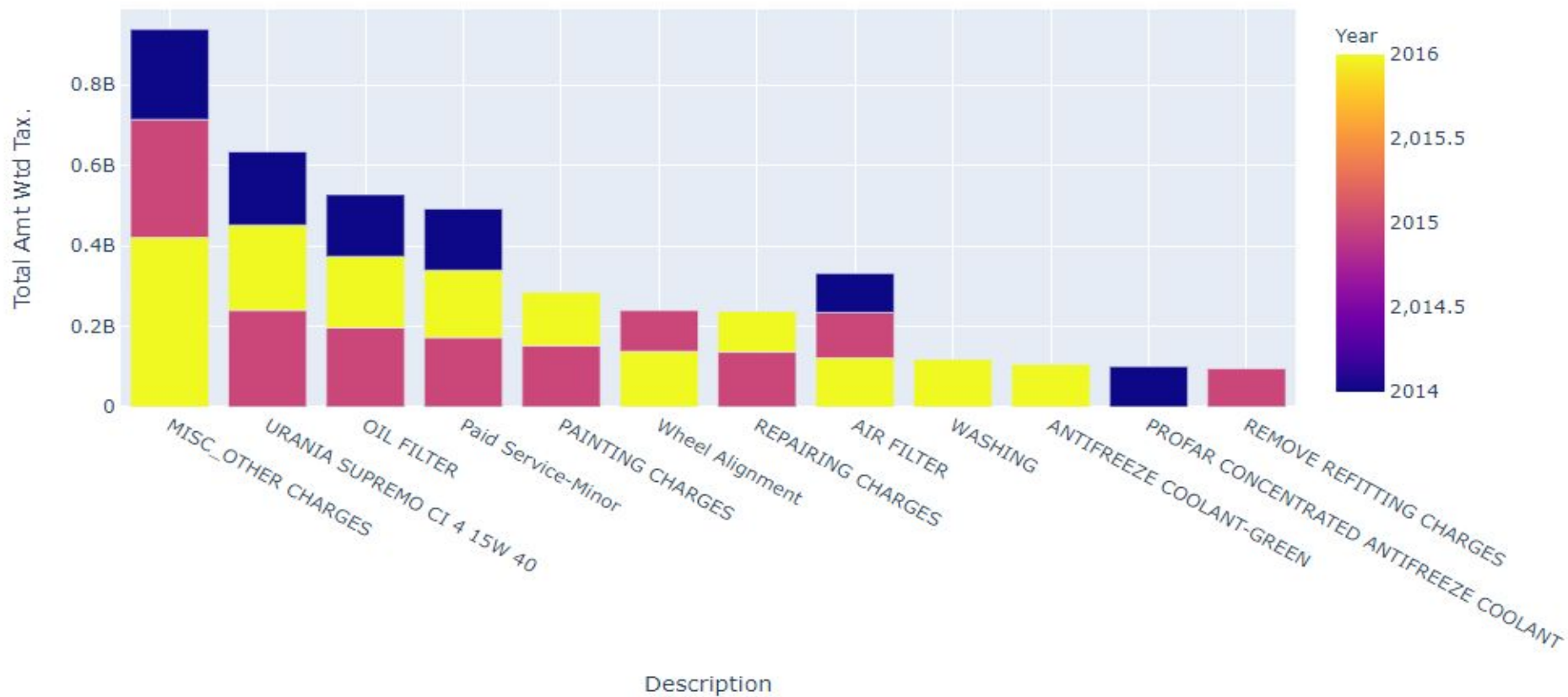# Yearly trend for usage of inventory items as per state

Yearly trend of usage of inventory items by makers.
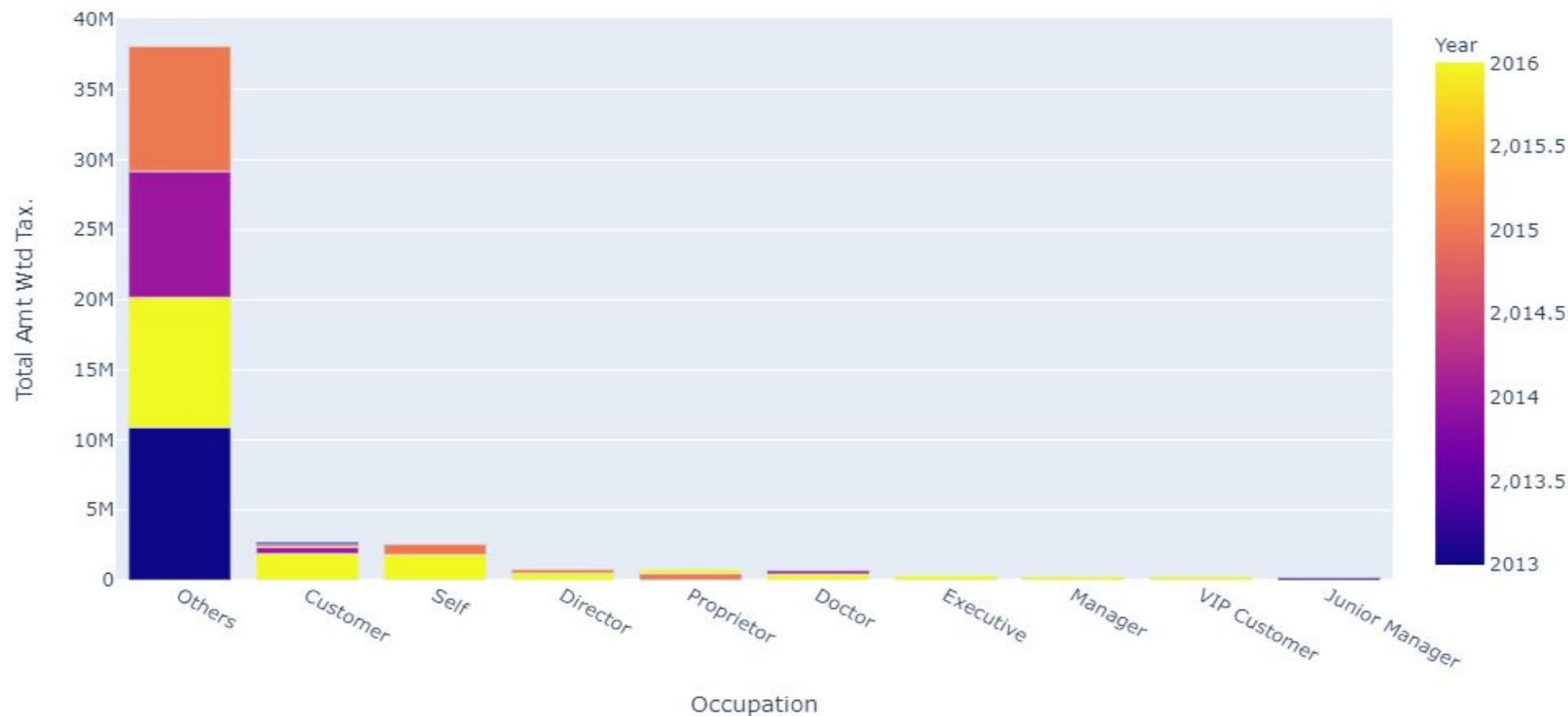
Usage of inventory as per order types.

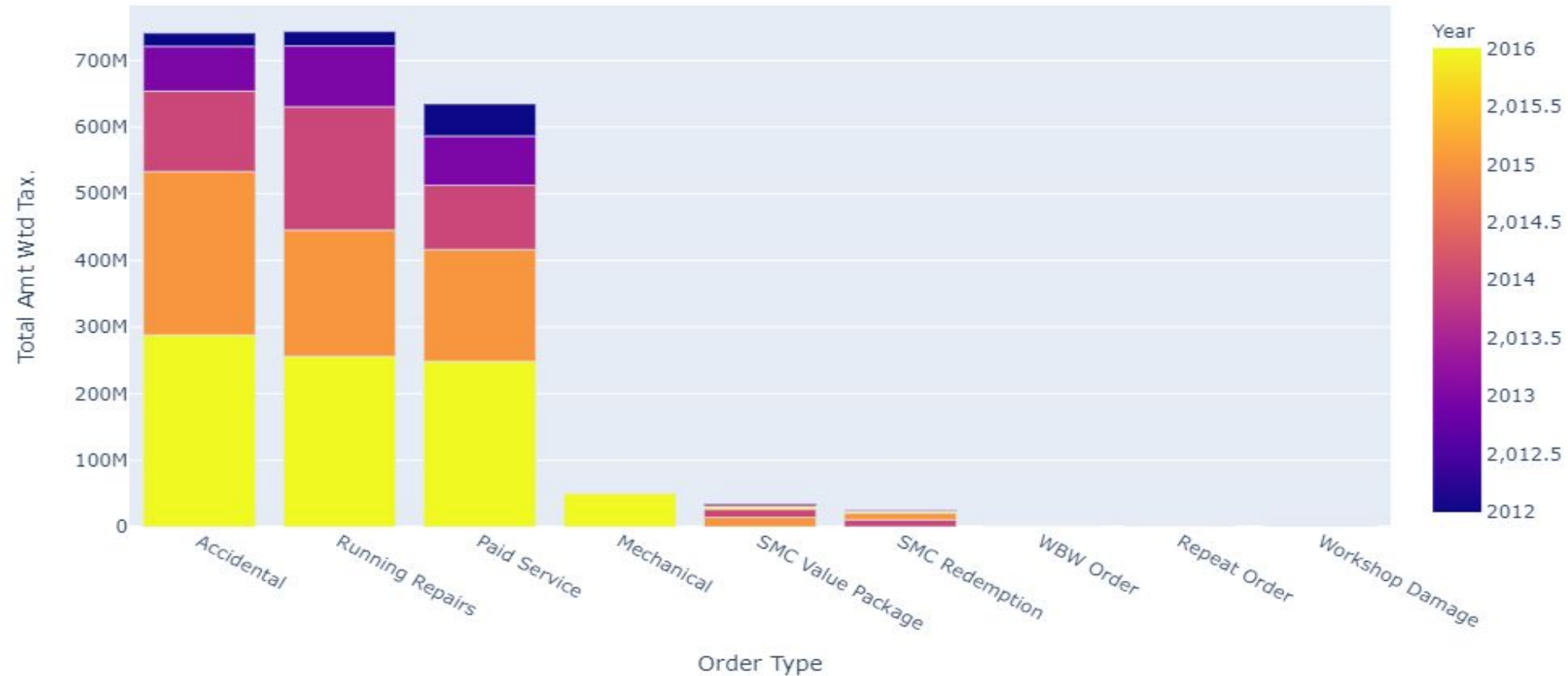# Revenue generated over the years by inventory materials

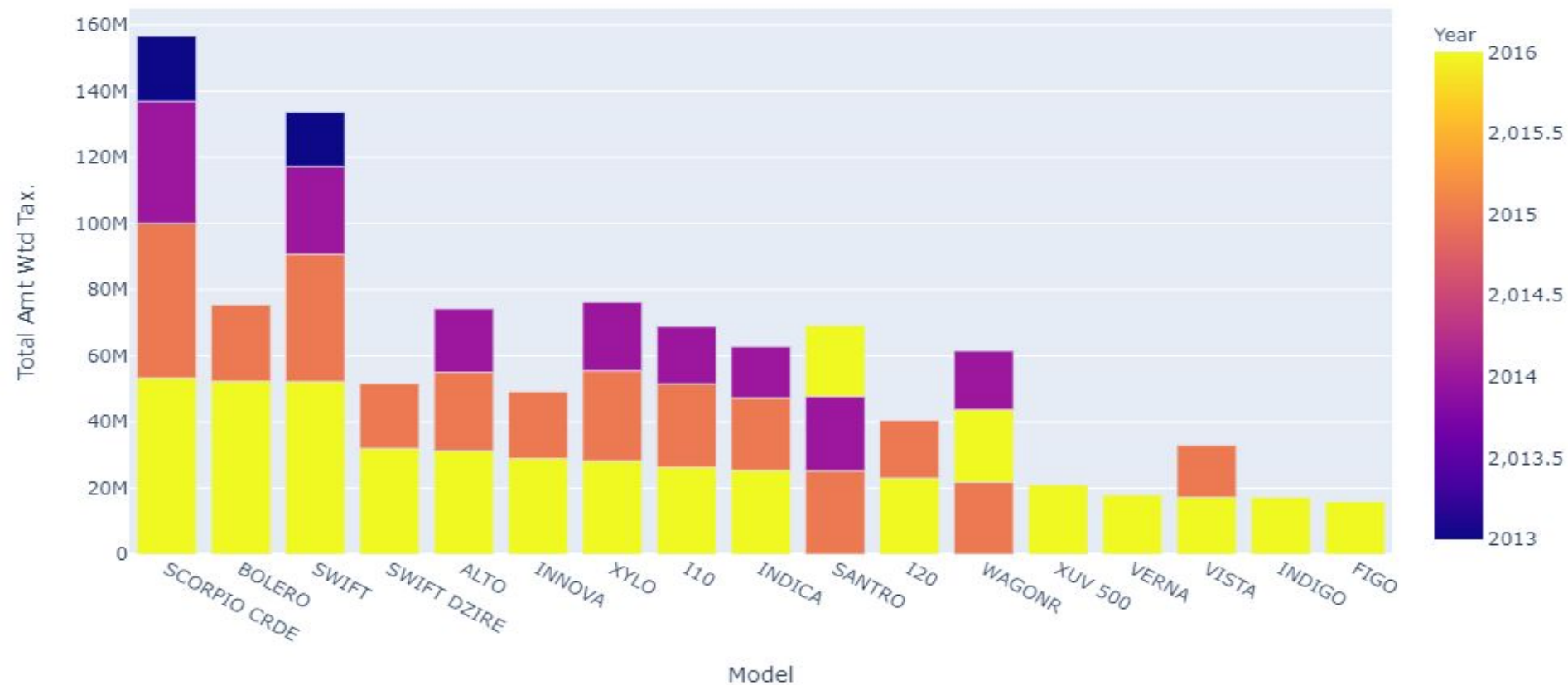# CUSTOMER PREDICTION BASED ON HISTORICAL DATA

What type of customers are to expected the most?

Service type which would be required the most

Models we can expect most

THANK YOU