



# Car Servicing Data Analysis for Business Strategy

(Mahindra First Choice Services - MFCS)

Driving business through data

SURESH CHAUDHARI  
ROHAN BARGHARE

AMEY GODE  
MANGESH CHAUDHARI

# Business Problem

- ❖ MFCS would like to expand their reach by increasing the customer service points. (Assumption – this could also be done in order to increase the market share by replacing competition)
- ❖ They are targeting to open 60+ new workshops in a short span of time across the country.

# Why solve this problem?

There could be multiple reasons to solve this problem:

- ❖ Understand ways to increase profitability
- ❖ Maintain continuity of good business
- ❖ Beat competition (understanding reach, geographical presence & identifying opportunity to open new centers)

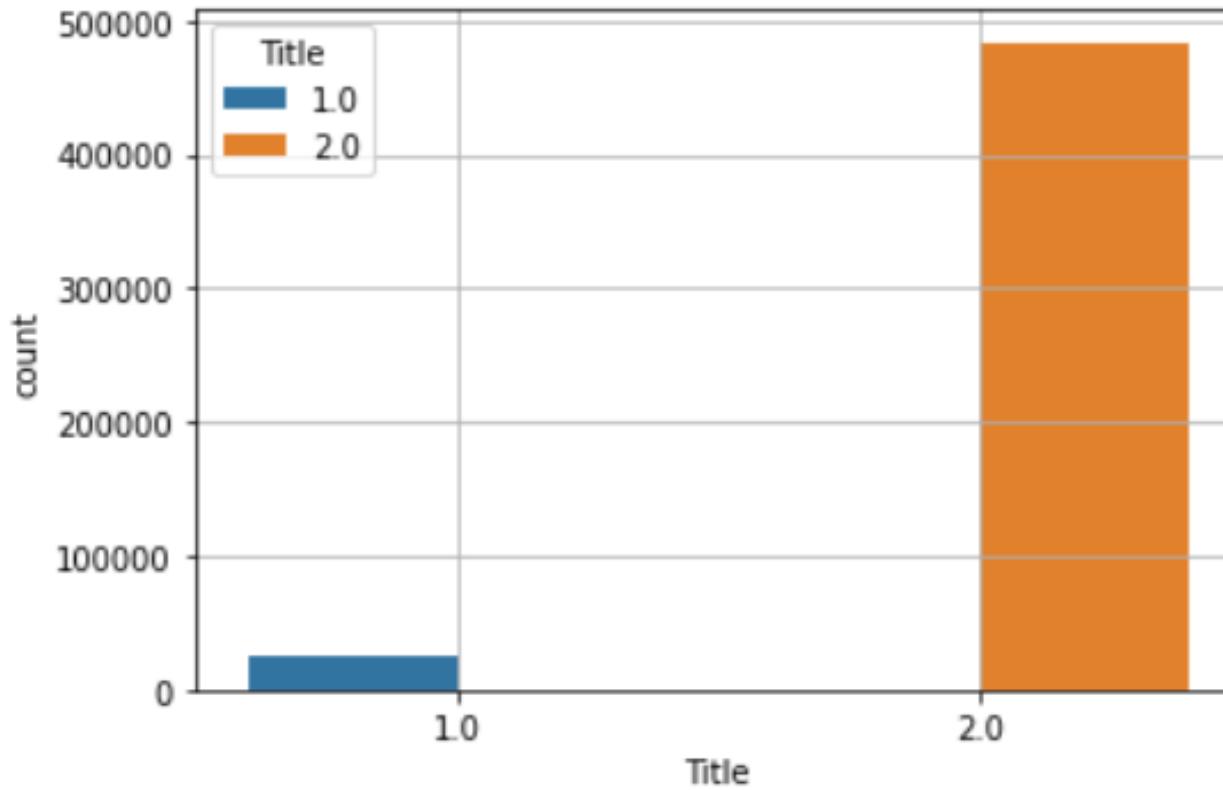
# Stakeholders Impacted

Stakeholders could be:

- ◊ Marketing Head (understand the ROI & success metrics of various activities)
- ◊ Sales Head (understand demand supply function based on various factors)
- ◊ Operations Head (understand ways to achieve efficient processes & provide better customer service)

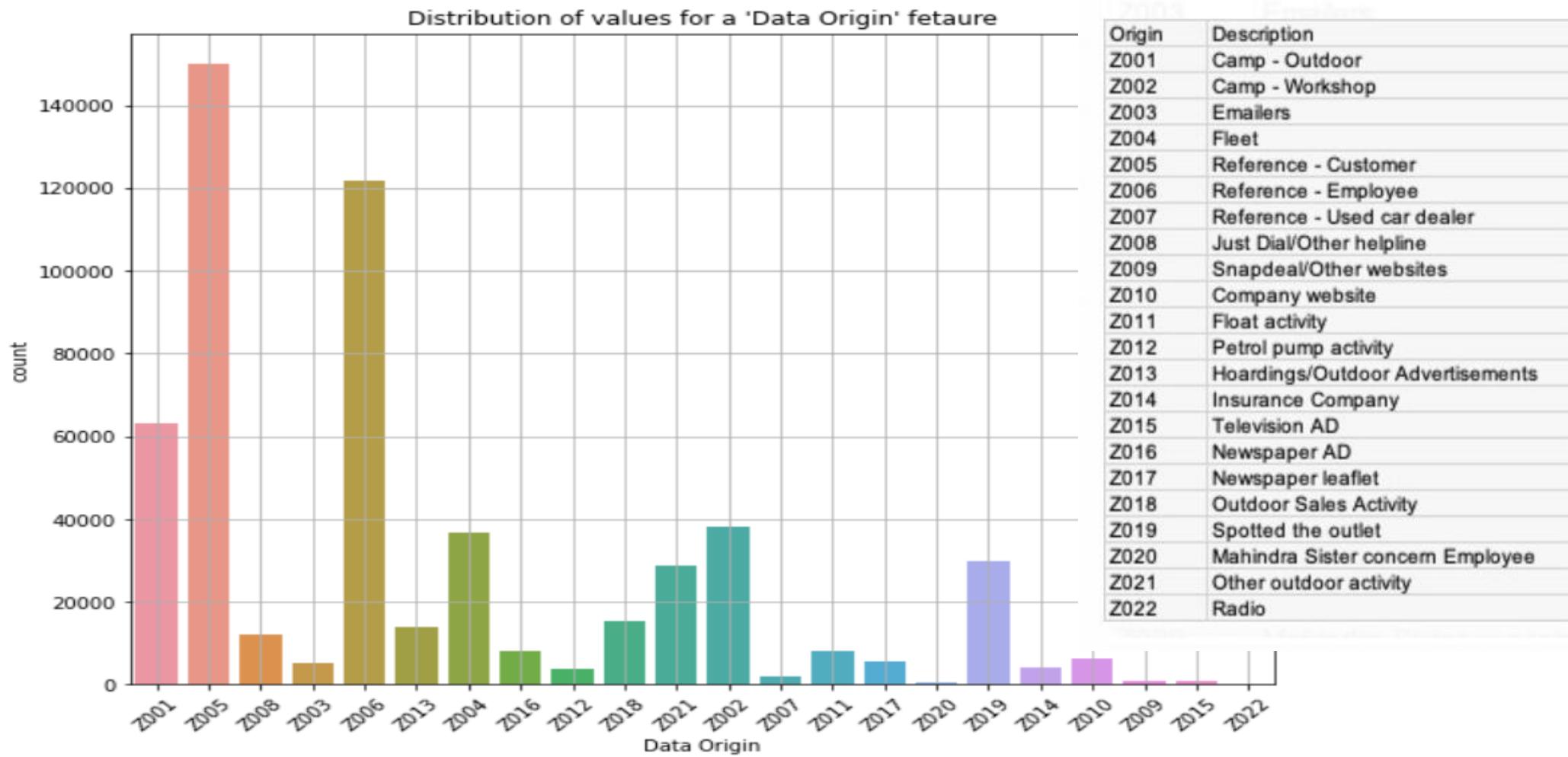
Let's look at EDA part

Distribution of values for a 'Title' feature

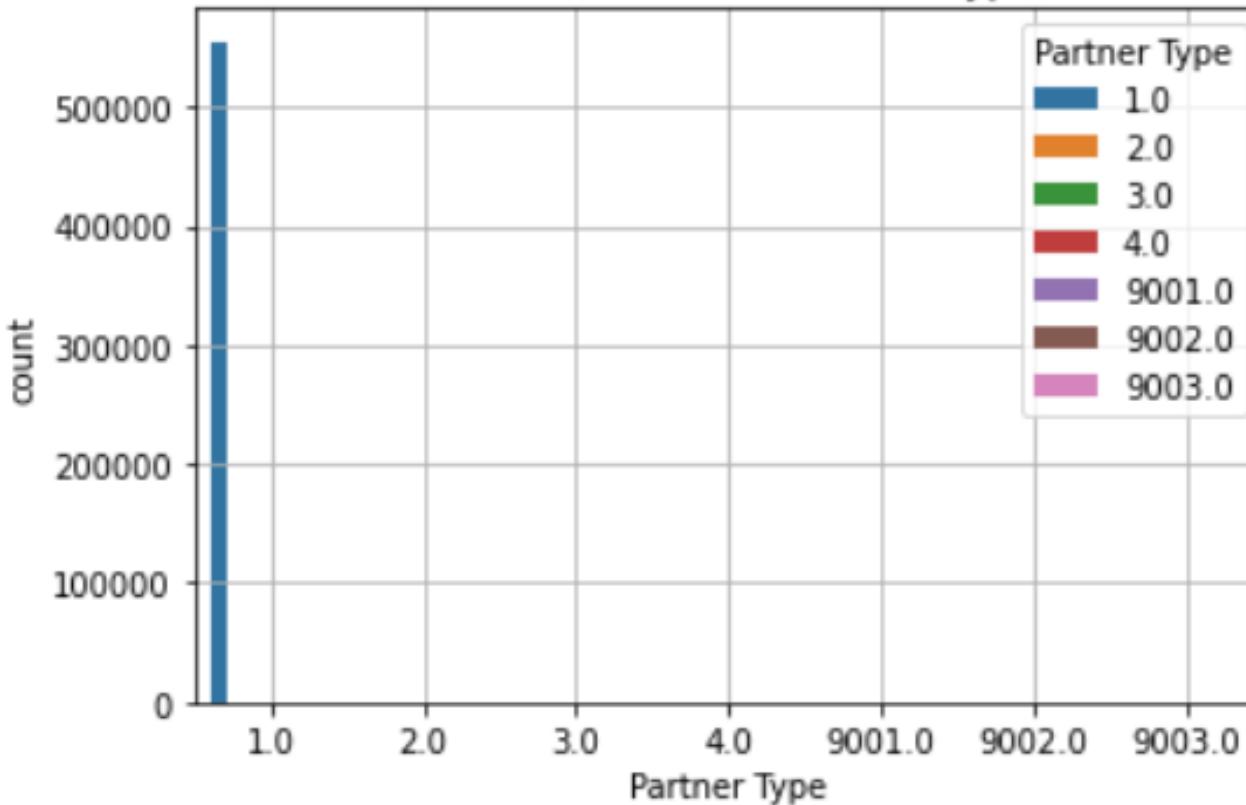


1.0 - Female

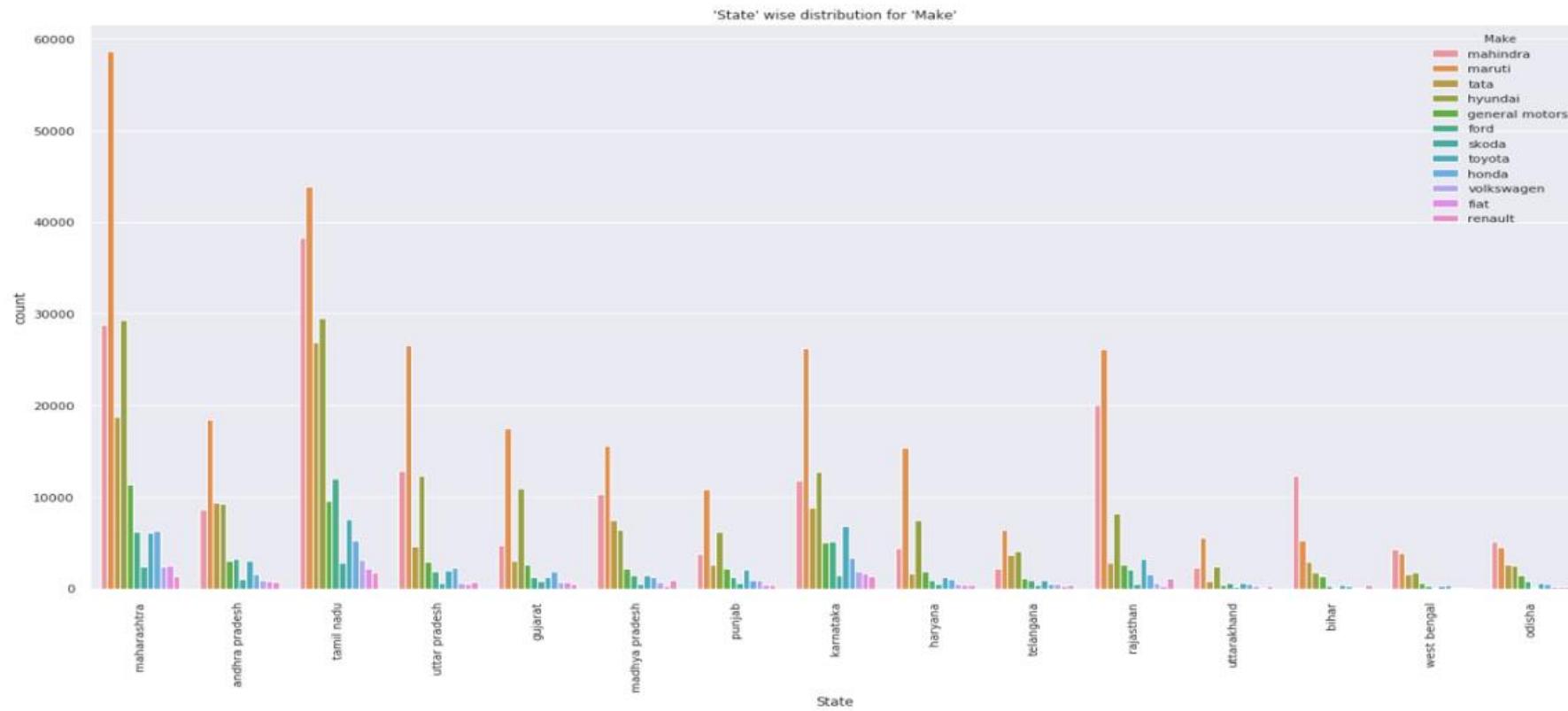
2.0 - Male

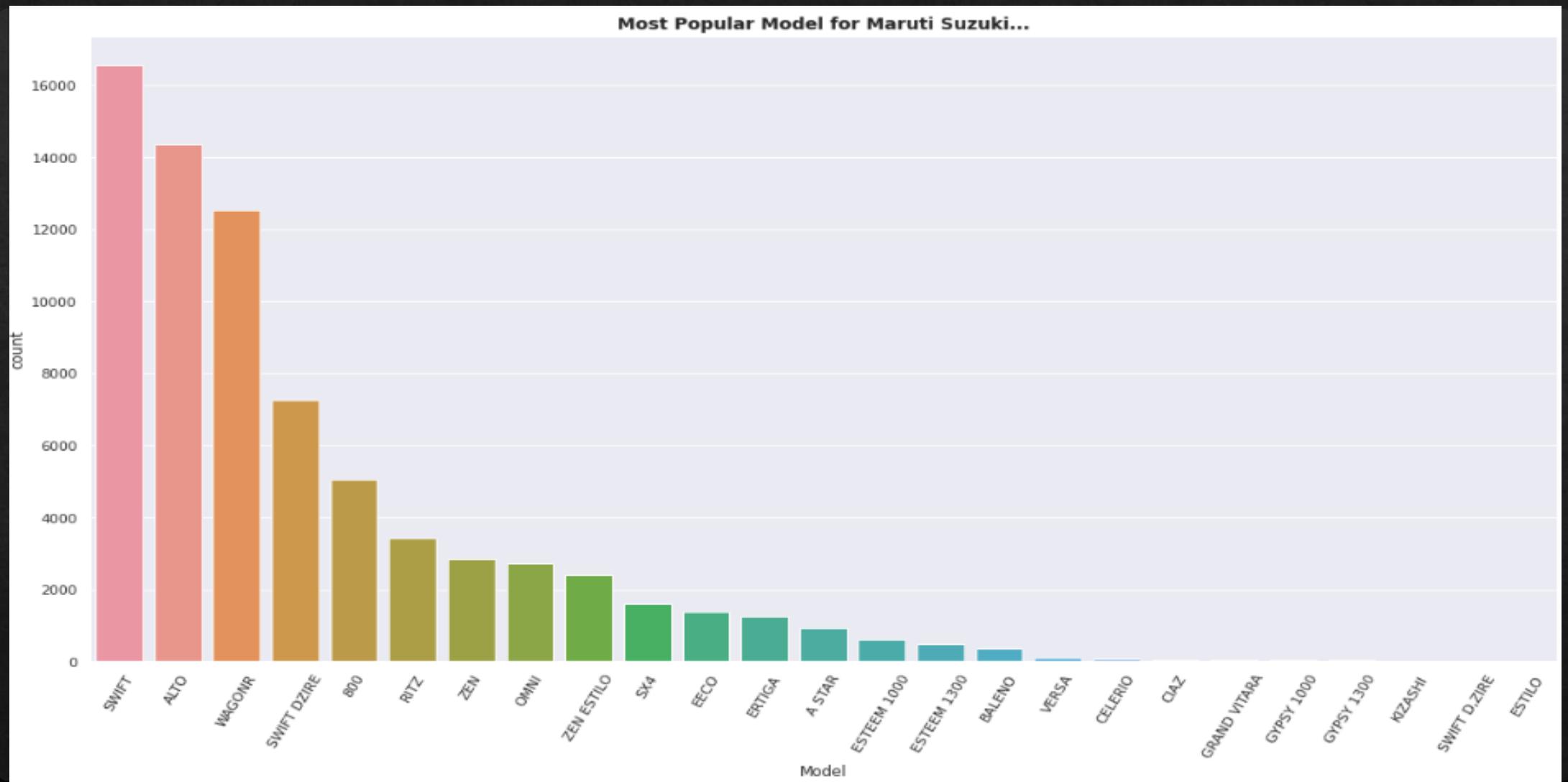


Distribution of values for a 'Partner Type' feature

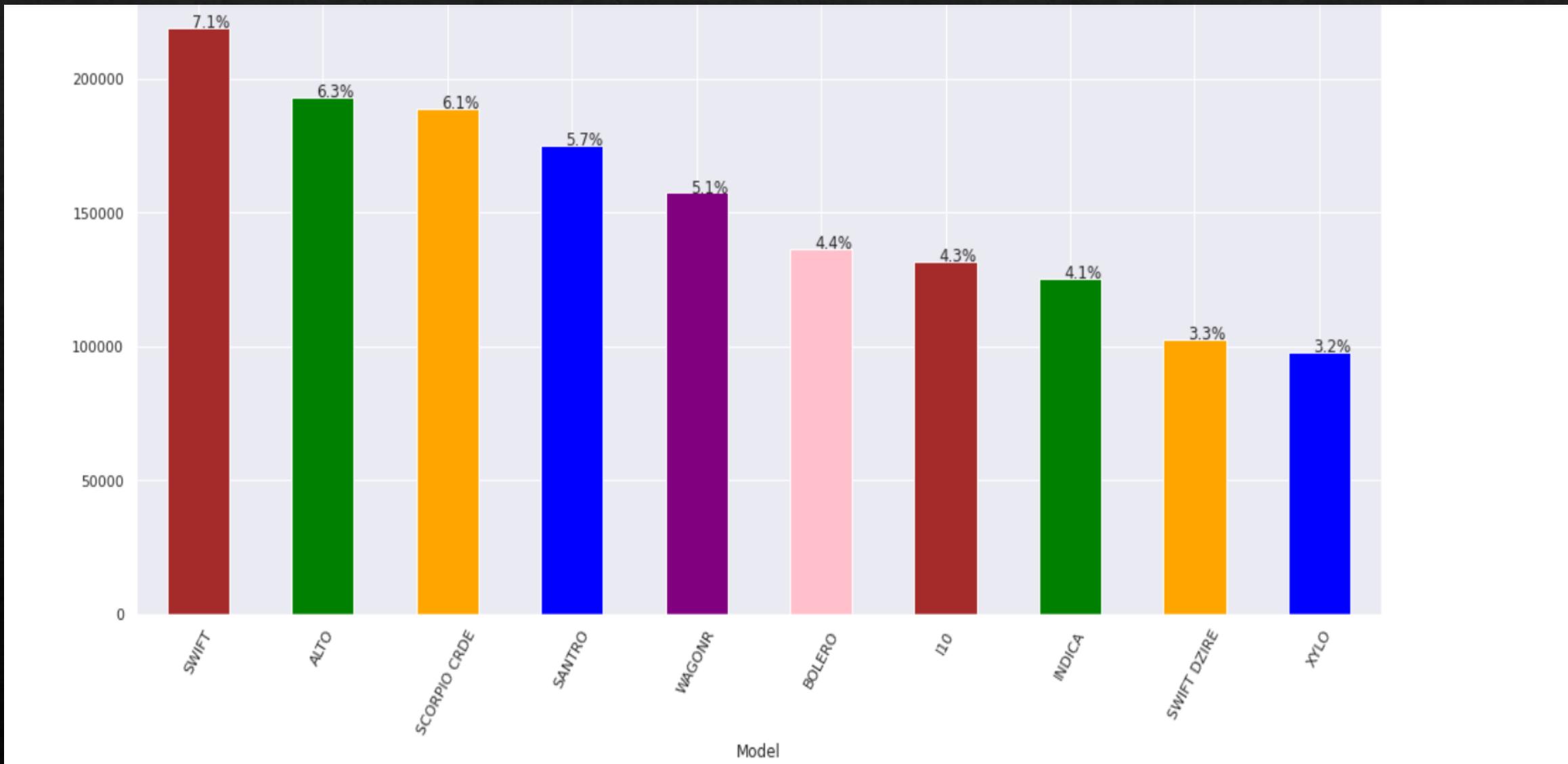


Type	Description
1	Retail
2	Corporate
3	Fleet
4	Employee
9001	Insurance Company
9002	Surveyor
9003	Contact Person

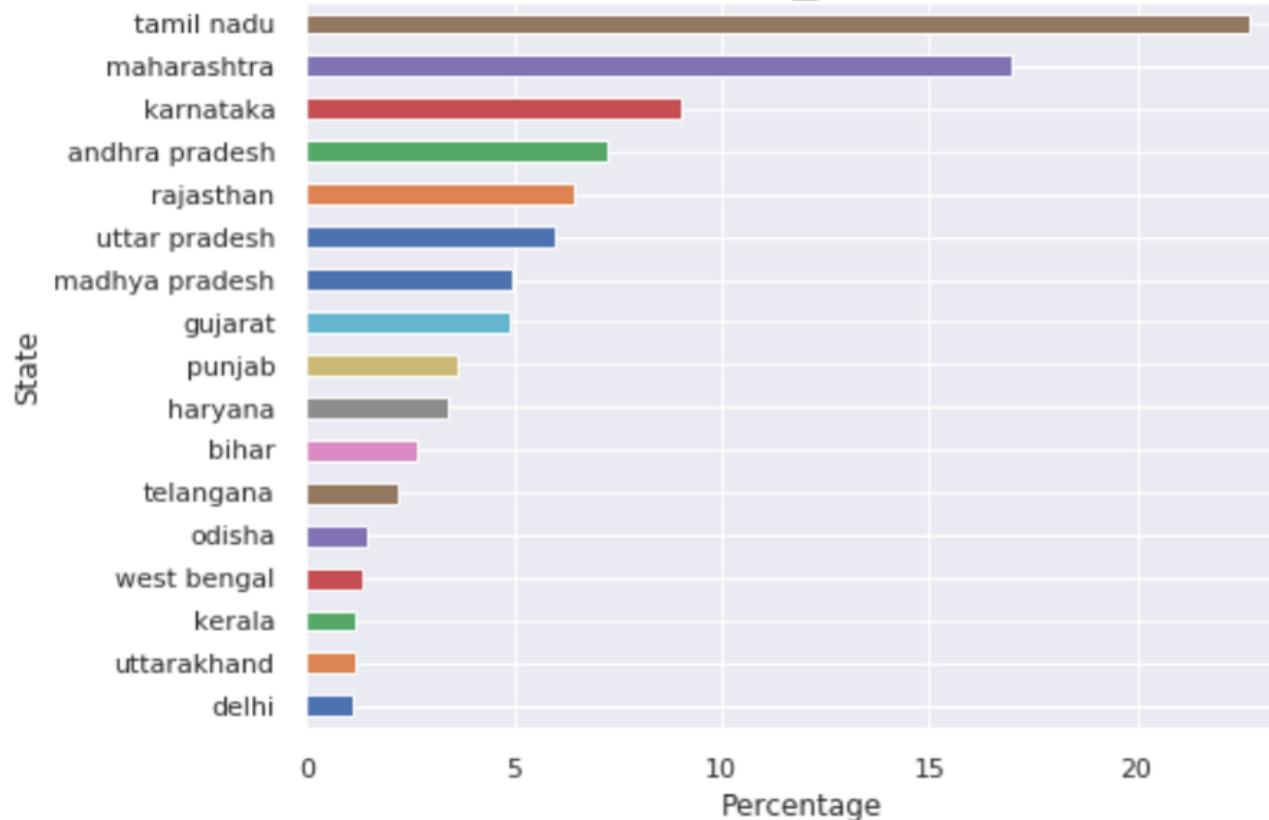




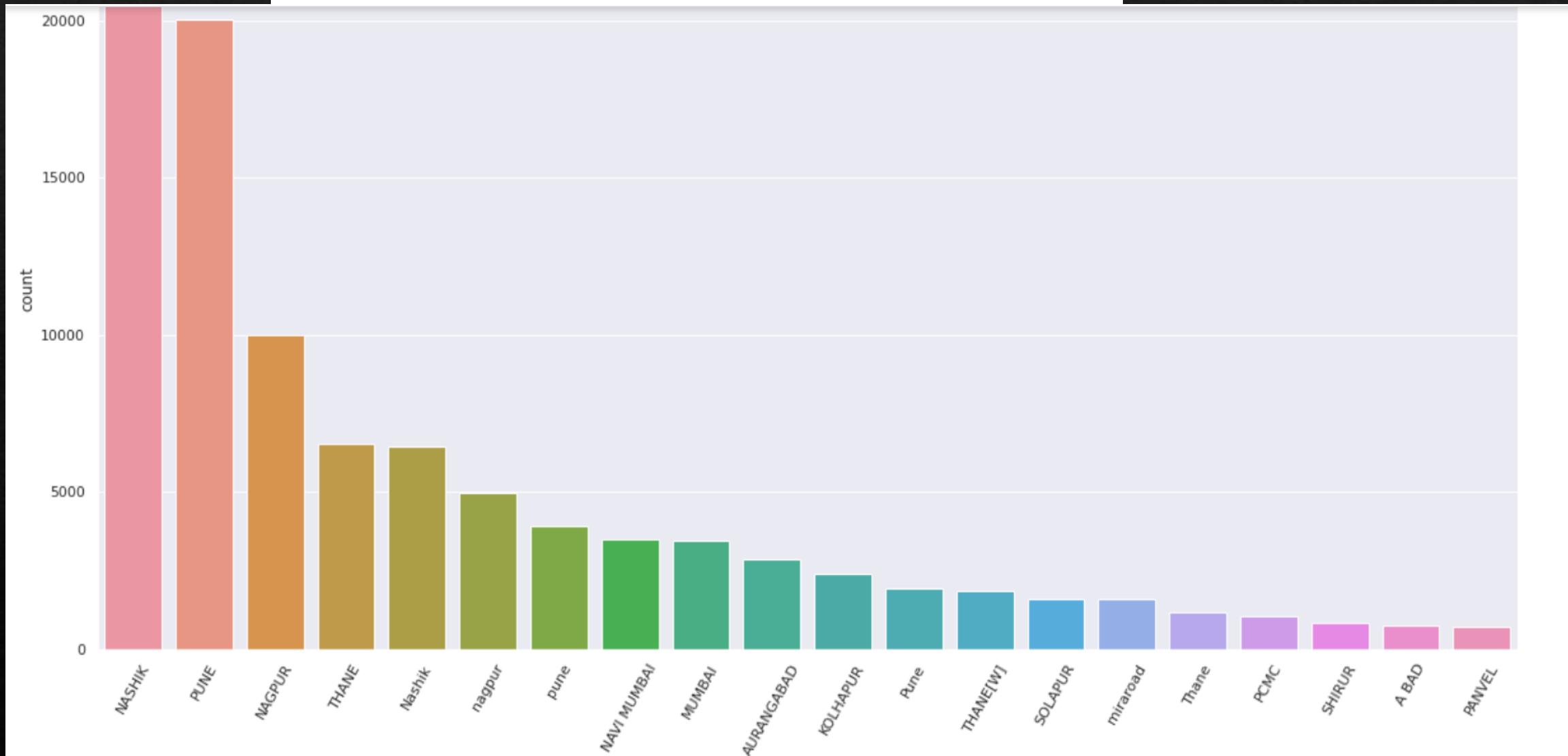
## Most number of services taken for particulat model...

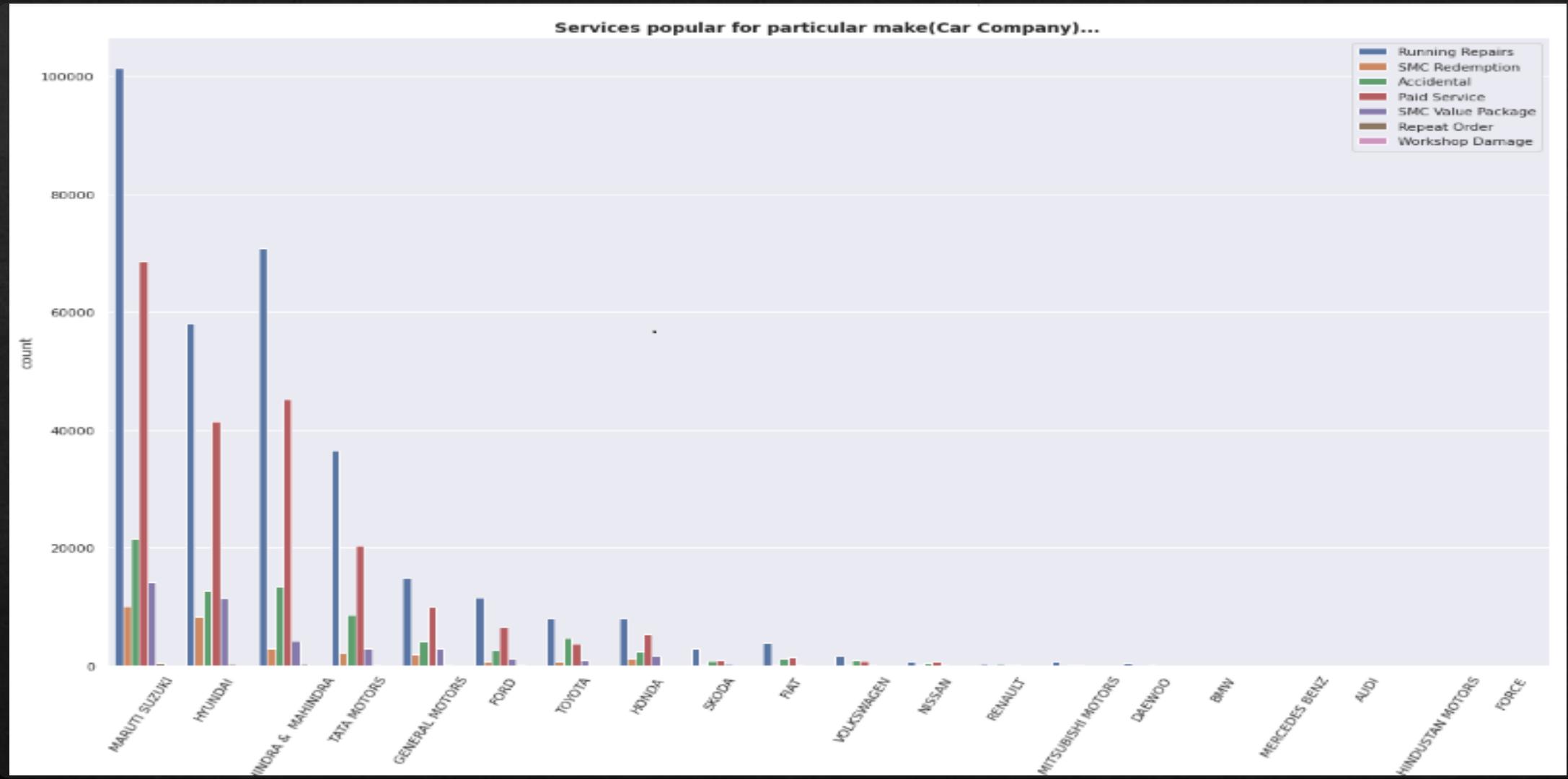


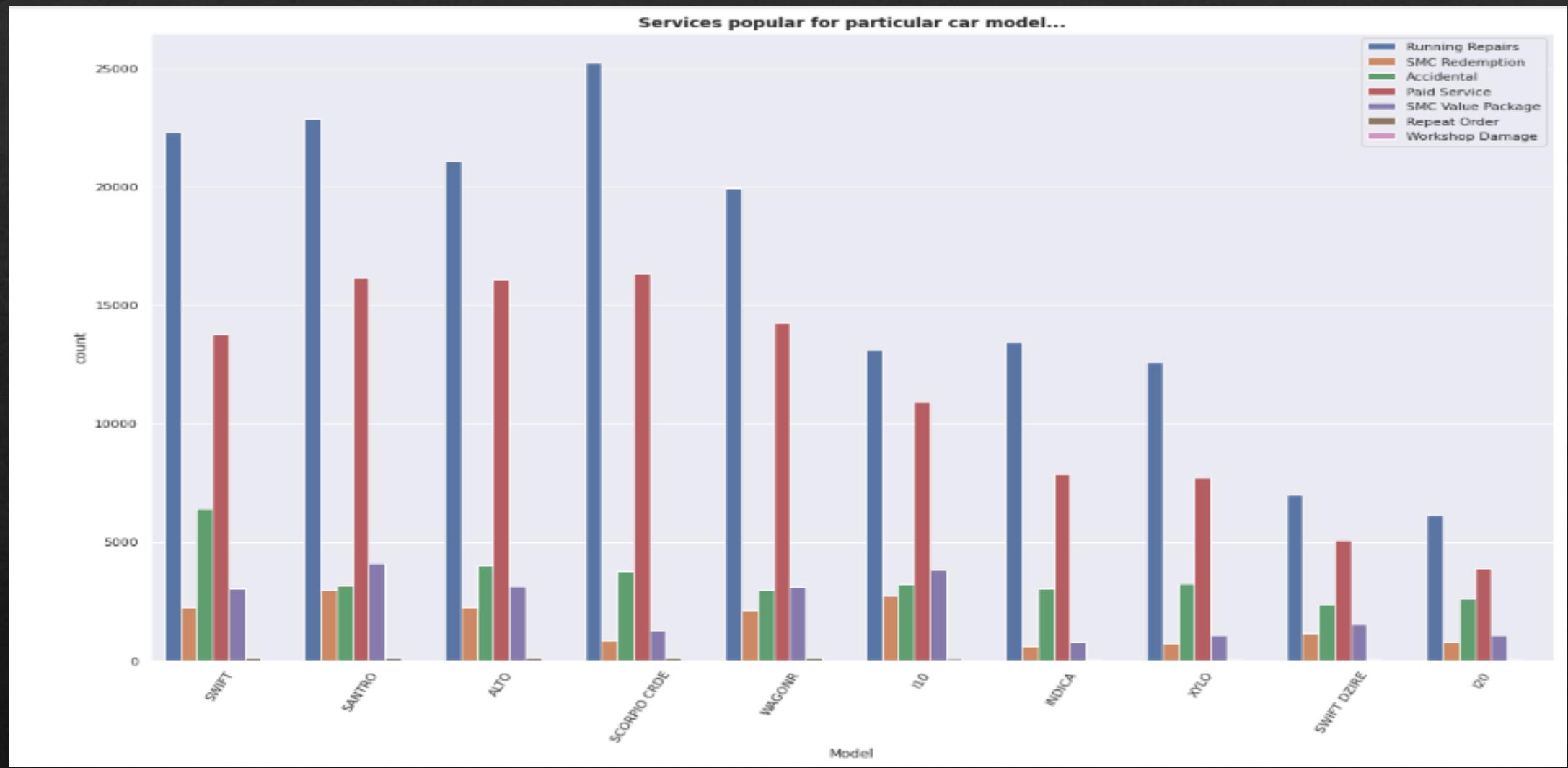
### Statewise Total Total\_Expense percentage

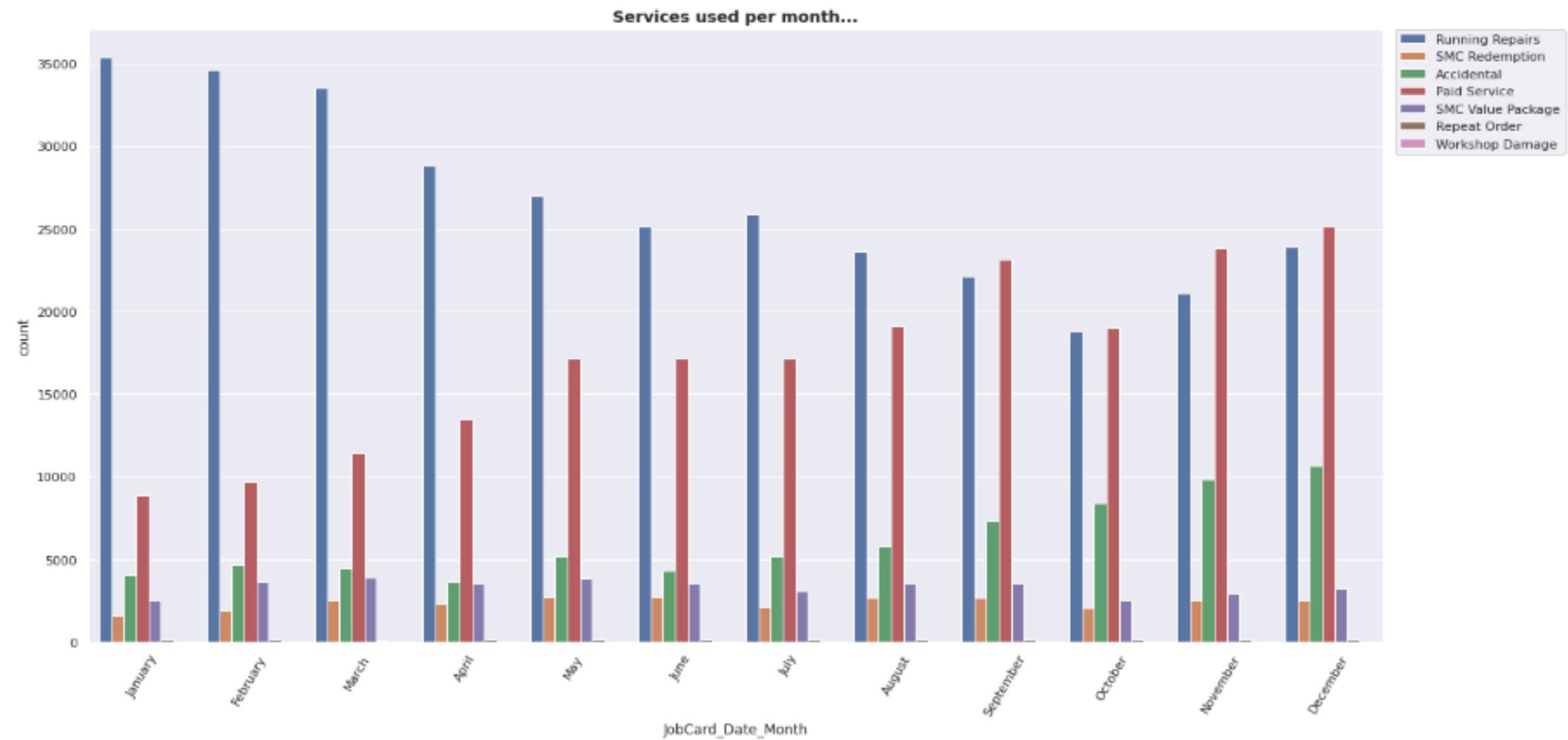


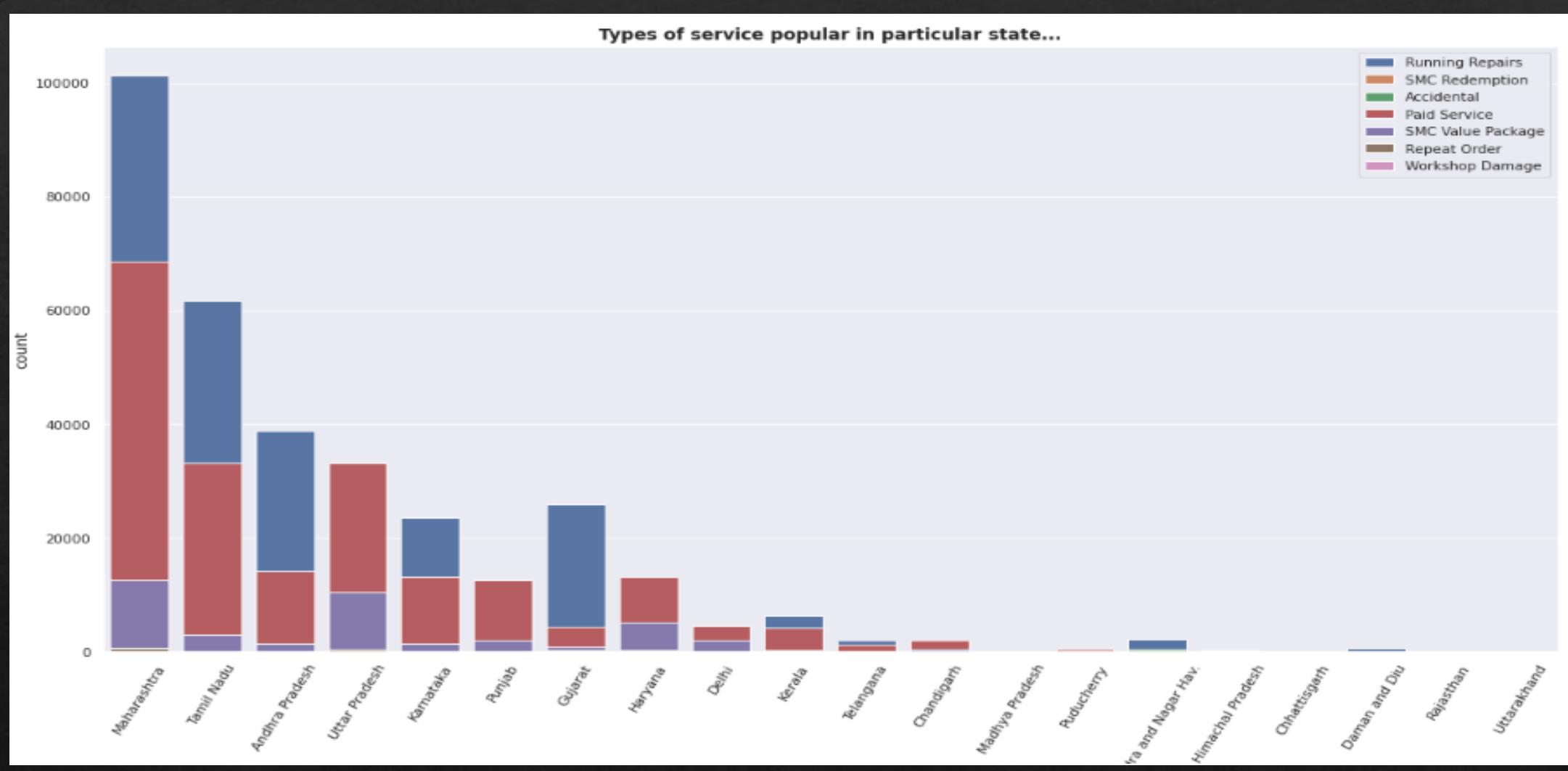
## Citywise distribution of customers for Maharashtra

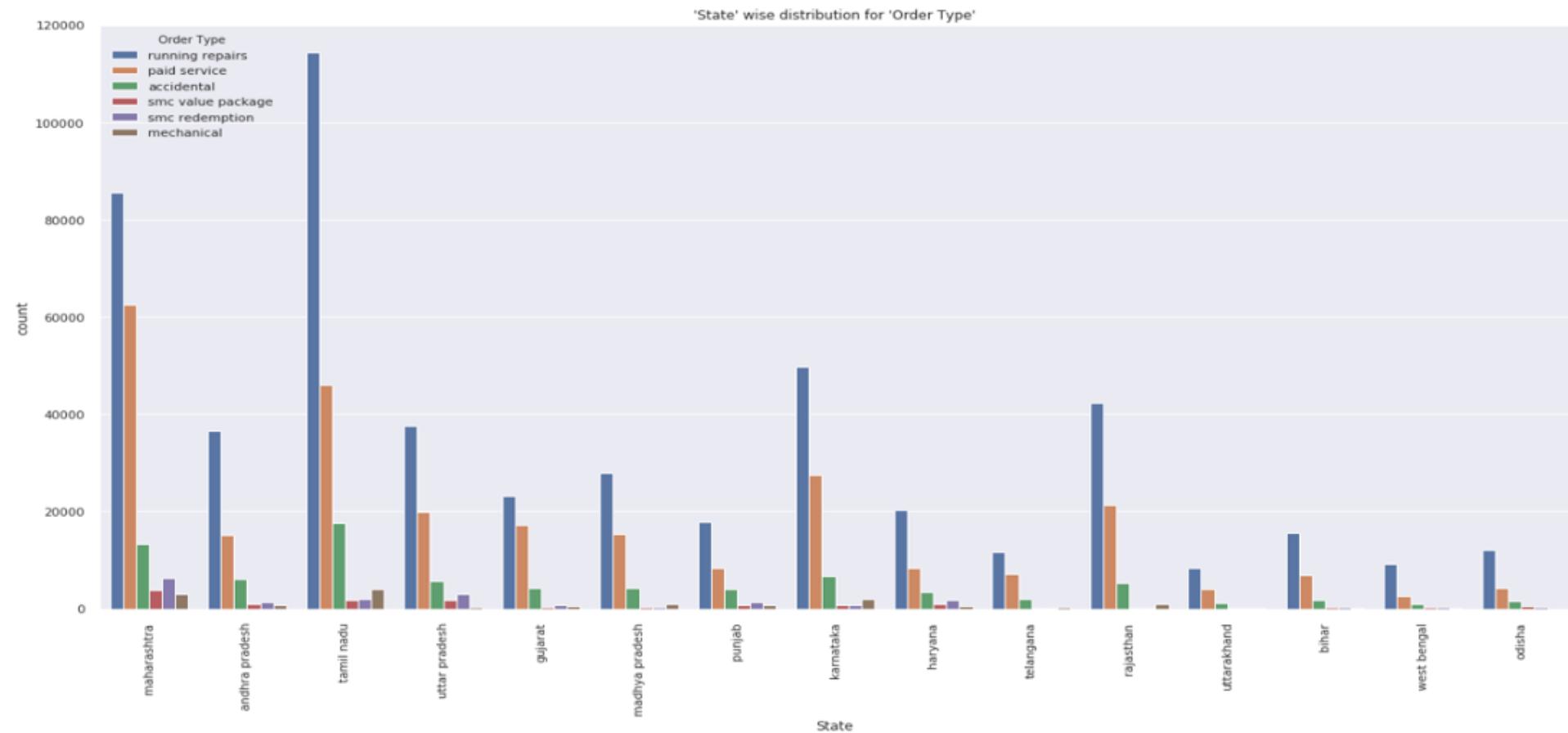




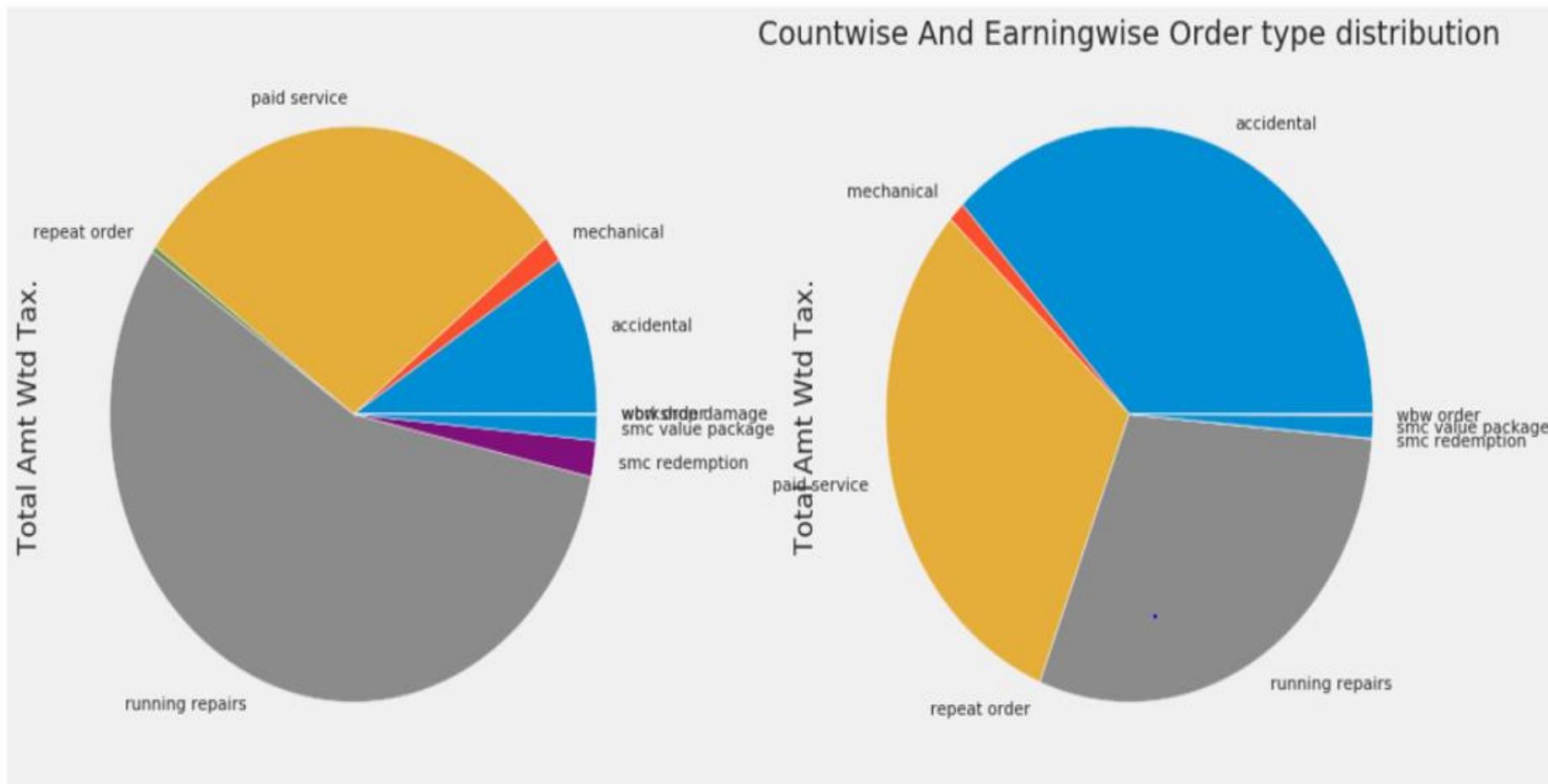


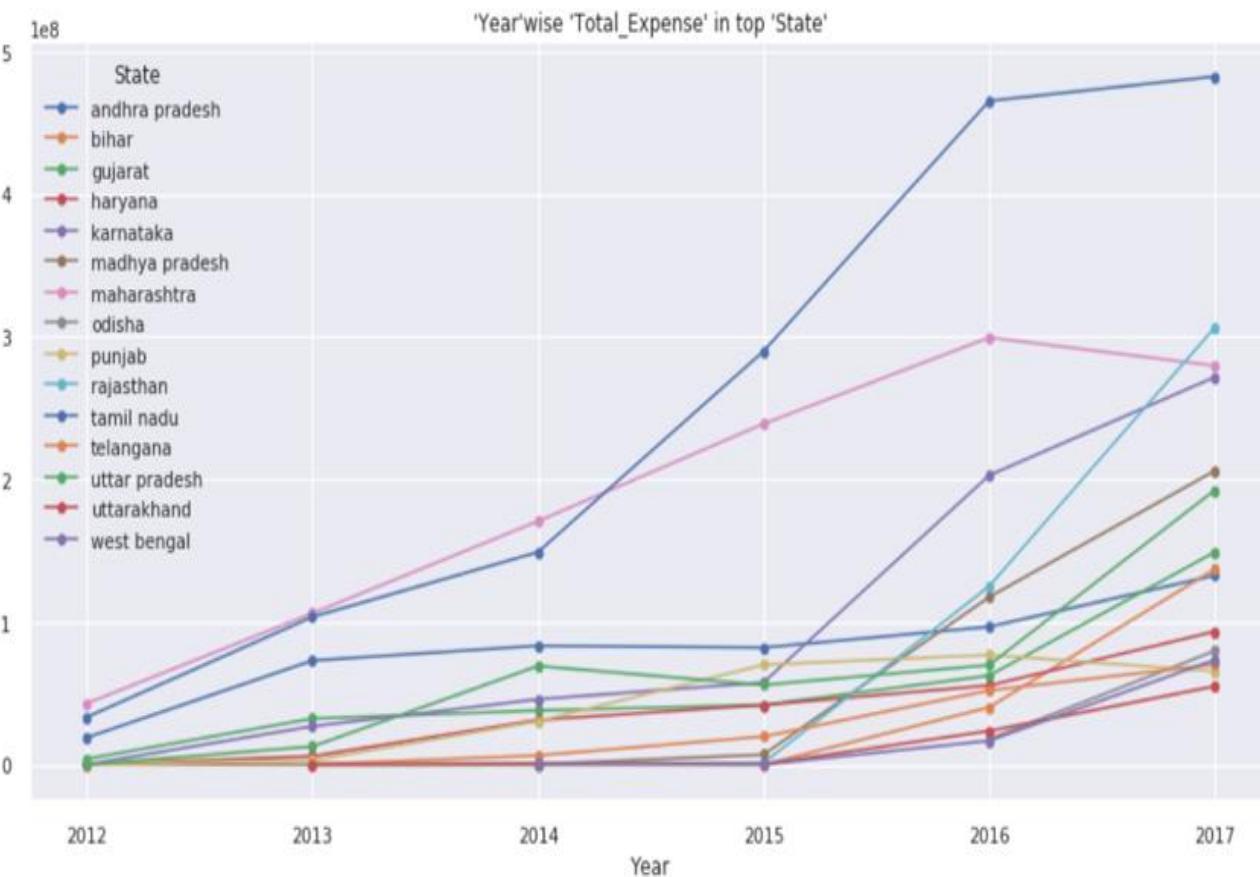






### Countwise And Earningwise Order type distribution





### Observation:

Uttarakhand has the lowest 'Total\_Expense' but the 'Tamilnadu' has increase a lot in the 2014 to 2016

# Insights

- ❖ SUV/Passenger tend to generate more revenue, as compared to their share by number of cars.
  - ❖ SUVs are bought to be used on rugged terrain, thereby leading to more wear and tear and hence frequent servicing
  - ❖ SUV/Passenger are run for longer km's due to their use in tour and travel industry
- ❖ Mahindra & Mahindra being the second in the number of cars tops the revenue charts. Reasons:
  - ❖ The point above can be validated, SUV have high service need and generate more revenue
  - ❖ Mahindra owners would have a high footfall at company owned service centers

# Insights

- ❖ Maruti Suzuki has less accident counts but are expensive on Accidental repairs this could be attributed to reasons like less sturdy structure and inferior quality.
- ❖ Pune has more cars, reasons could be lack of good public conveyance, availability of service class population and therefore high affordability to buy cars, could infer it needs to work on the pricing strategy of these packages

# Insights

- ❖ Maximum number of cars are serviced in the km range of 50K-100K.
- ❖ While there are no spikes seen in revenue all through a car's lifetime, accidental damages top the chart in terms of revenue and become exponential after a car crosses 1.6M kms, which may infer a car beyond 1.6M kms, becomes more prone to accidents
- ❖ While labor costs of MFCS remains constant in almost all service types, the outsourced labor is the highest in case of accidental repairs.
- ❖ While paid services top the chart in terms of demand, accidental services contribute maximum portion of the revenue generation. Accidents being uncontrollable activity, is not something that can be worked upon to enhance revenue hence one must look at the second-best category i.e., running repairs.
- ❖ Common spikes seen across region in the month of May(onset of vacations), July(onset of Monsoons) and October(festival seasons/offers).

# Insights

- ❖ Top 3 lead generating channels include references, campaigns and outdoor activities i.e., cost intensive marketing activities like hoardings, TVC or any other media promotion are not fruitful.
- ❖ Insurance is the best alternate source of revenue and can be focused for targeted marketing.
- ❖ Of all the leads generated, almost 50% leads for categories like luxury, hatchback, sedan & SUV were generated either via word of mouth (references – customers / employees) or outdoor activity.

# Insights

- ❖ There has been consistent upward movement in terms of number of cars serviced, revenue generated as well as the number of workshops opened.
- ❖ Year 2014 saw a dip in the count of cars serviced, reason could be – strategic change by Mahindra group, this was also visible in the workshop distribution graph & map as there were not many new workshops added in the year 2014 compared to high additions seen in other years.

# Insights

- ❖ **Zone as well as State level -**
  - ❖ East needs penetration and attention in terms of presence of workshops (Bihar is amongst top 5 states)
  - ❖ South has been improving at a steep curve
  - ❖ North has shown improvements in alternate years after constant growth
  - ❖ West has been slow and consistent as compared to other zones but can catch up with south if focused. (both in terms of numbers & revenue).
- ❖ **Tier level –**
  - ❖ Tier 1 cities need attention as there is decline seen (might be entry of new competition / activity by an old player)
  - ❖ Tier 3 can be focused upon to achieve consistent growth, this could be through specialized schemes & programs.

# Insights

- ❖ Loyal customers have been seen to spend equal proportions on all types of services while the rest of the others visit mainly for running repairs & paid services.
- ❖ There should be customized marketing programs that can be designed to target each customer segment – New, Loyal, Need attention, About to sleep, lost etc.

# Why RFM?

## What is RFM?

- ❖ RFM analysis allows you to segment customers by the frequency and value of purchases and identify those customers who spend the most money.
- ❖ Recency – how long it's been since a customer bought something from you
- ❖ Frequency – how often a customer buys from you
- ❖ Monetary value – the total value of purchases a customer has made
- ❖ RFM is an excellent segmentation method for predicting customer responses, improving interactions, and increasing profits. RFM uses customer behaviour data to determine how to work with each customer group.

# Customer Lifetime Value Prediction

# What is Lifetime Value?

- ❖ Lifetime value of a customer is the total amount that the customer is expected to spend on our business, during their lifetime.
- ❖ Based on the historic data, we identify the value associated with each customer, and then predict the value of a set of customers in the same segment.

# How do we predict it?

- ❖ We begin by identifying the **average order value** that the customer brings per visit, and **their total visits**.
- ❖ We also consider the **profit margin** and the **repeat rate** of customers
- ❖ We then calculate the CLV (Customer Lifetime Value) and segment customers on that basis
- ❖ In the end we have a model that predicts the value for our existing customers in the coming period, or for segmenting a new set of customers.

# Modelling

Predicting Lifetime Values

# Classification & Regression Models

Classification Models	
Models	Accuracy
DecisionTreeClassifier	0.87
RandomForestClassifier	0.86
XGBClassifier	0.88
Regression Models	
Models	RMSLE
LinearRegression	1.279
LGBMRegressor	0.764

THE  
HOTEL