Data Visualization Using Tableau

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Project Objective

Consider that you are a Lead Data Analyst at an Insurance Claims company that has provided you with the Car Insurance Claims dataset. You have been given a task to explore the data, create different plots and interpret useful insights/findings. Your end goal here will be to create a storyboard that you have to present to the Senior Management and the story has to have an end objective and should follow a logical flow to display that you are heading towards achieving the end objective. This will help the Senior Management in taking some decisive actions on the current claims system in place. This storyboard will be an open-ended story for you to explore various different features in the data and try to showcase different plots. Make sure to have minimum clutter in the plots, follow a consistent color scheme across all the plots, and use proper colors to highlight a specific insight. Moreover, your plots on all the dashboards should be interactive and responsive. *There should be 1 dashboard that should cover the summary of the story as well as your recommendations.*

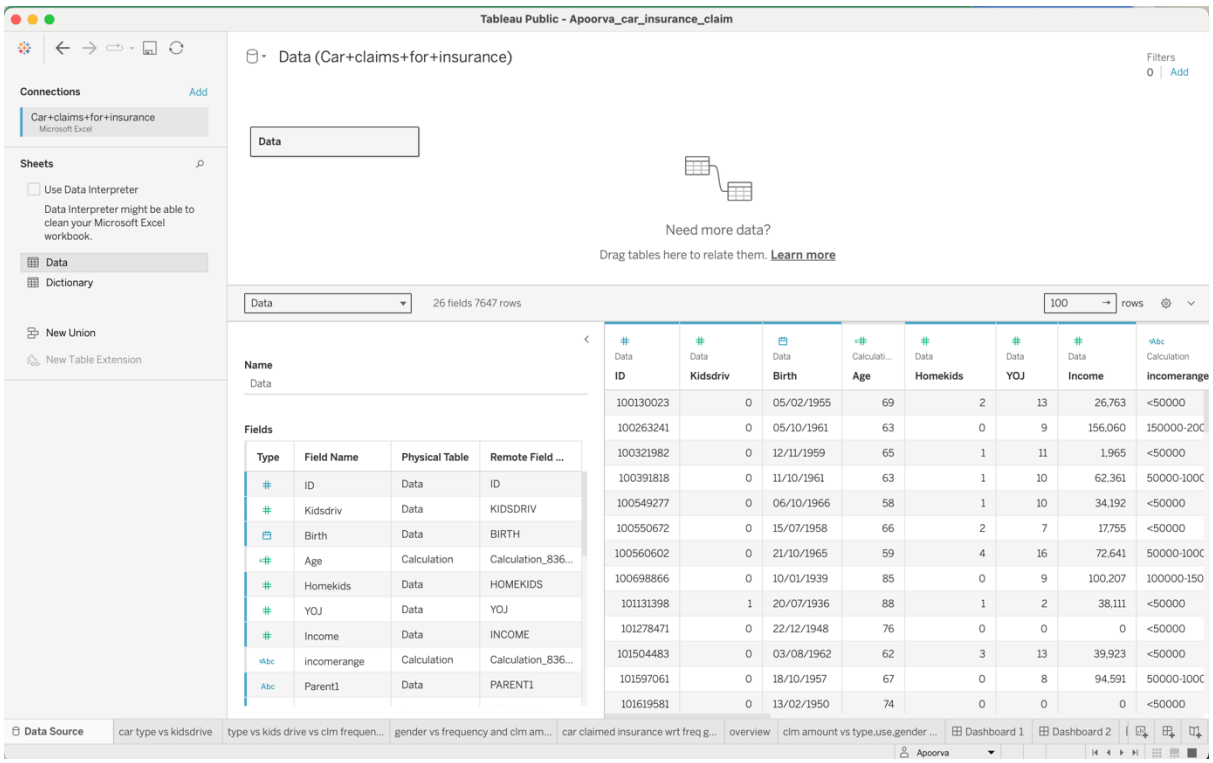
Assumptions

- There are several factors which are provided in the dataset. However, there may be other unseen factors that are not considered
- the dataset has no missing data.
- Car Owner and Driver are same
- Amounts are in Dollars ($)
- birthdate will lead to number of years/age computed as at 2024.
- The dashboard presented are intended to analyse the car insurance claims in details, in order for the insurance company to have an informed understanding of their customer base and to provide a better customer service.

Data Dictionary

The dataset has data on 7647client's car insurance information, it includes the customer demographic information (birthdate, income, marital status, gender, education level, occupation, travel time.), the insurance claim information (worth of car, claim amount, claim frequency, age of car etc).

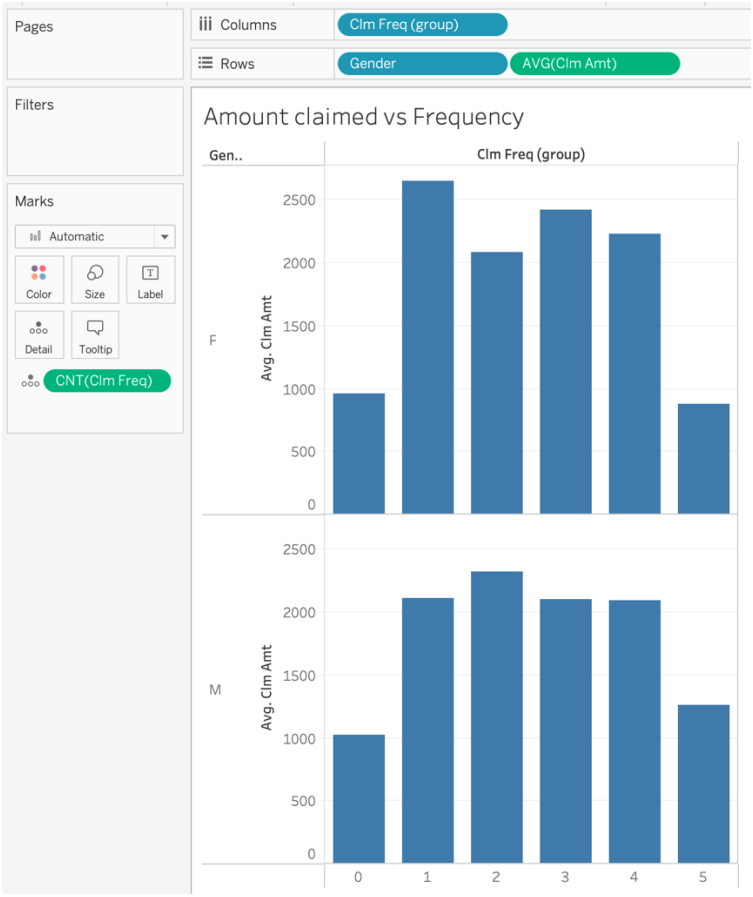
ID	Identification Variable
KIDSDRIV	Number of teenagers among the car owner's children who can drive a car.
BIRTH	Date of birth of the driver
HOMEKIDS	No of children the car owner has
YOJ	Years on Job. How many years has the owner of the car been working?
INCOME	Income of the driver
PARENT1	Is the car owner a Single Parent
HOME_VAL	Value of the house owned by the car owner
MSTATUS	Marital status of the car owner
GENDER	Gender of the driver
EDUCATION	Maximum Education level of the driver
OCCUPATION	Occupation of the driver
TRAVTIME	Time taken to get to work on an average
CAR_USE	Purpose of using the car
BLUEBOOK	What is the worth of the car. Value of the Vehicle(in dollars)
CAR_TYPE	Car type
OLDCLAIM	Total claim (in past 5 years - in dollars)
CLM_FREQ	Number of claims (in past 5 years)
CLM_AMT	If car was in a crash, what is the currently claimed amount(in dollars)
CAR_AGE	Age of car
URBANICITY	Where the car is being driven primarily

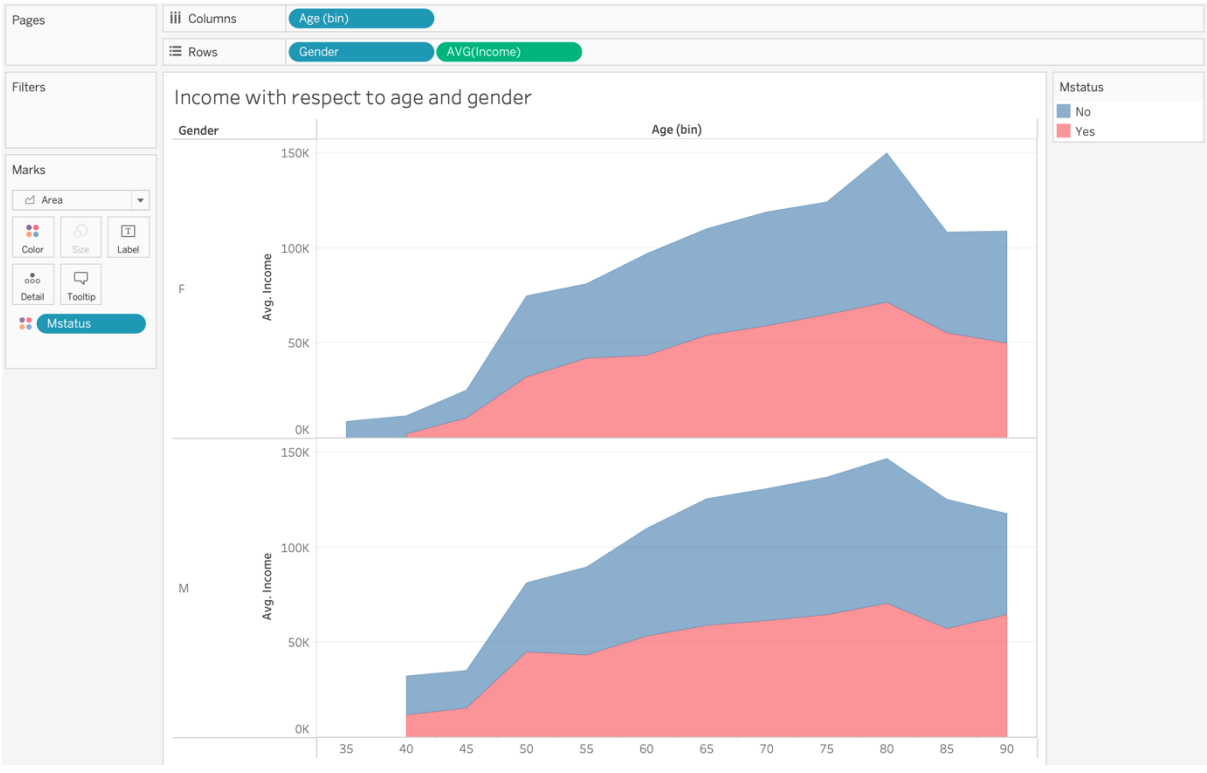


Creation of New Calculated fields

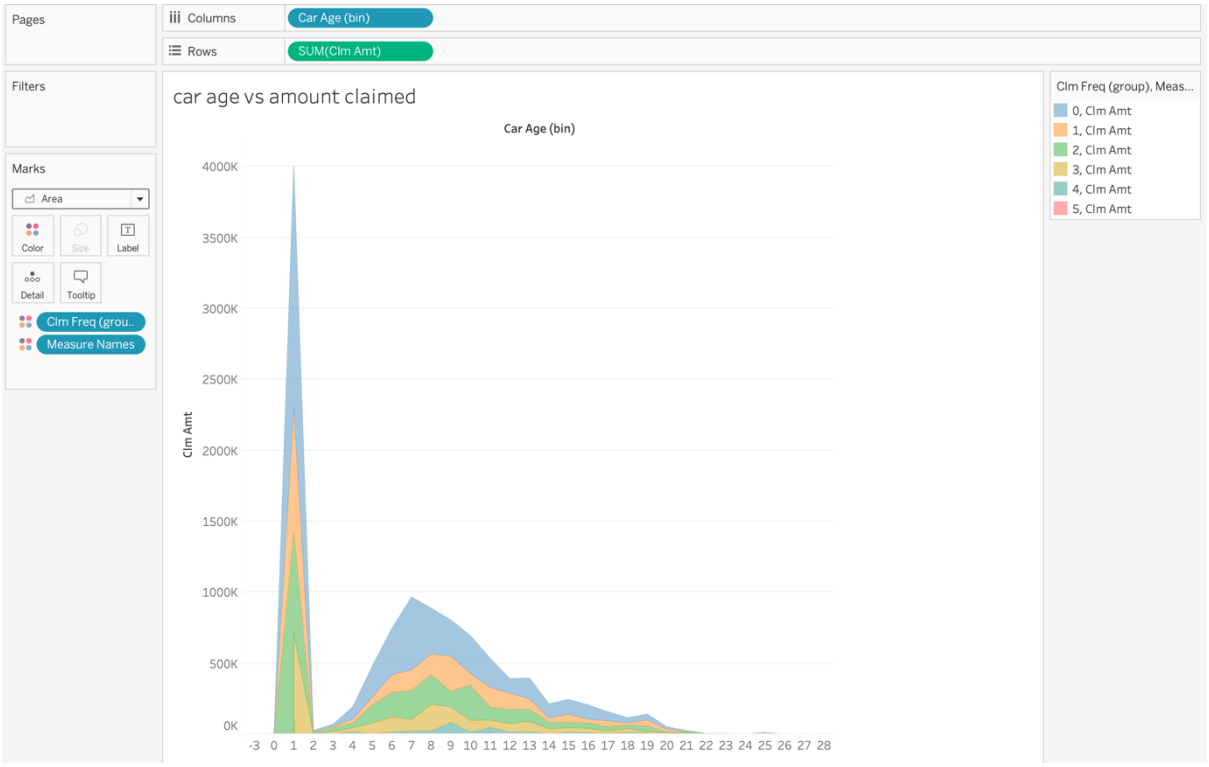
Calculation of age from birth date

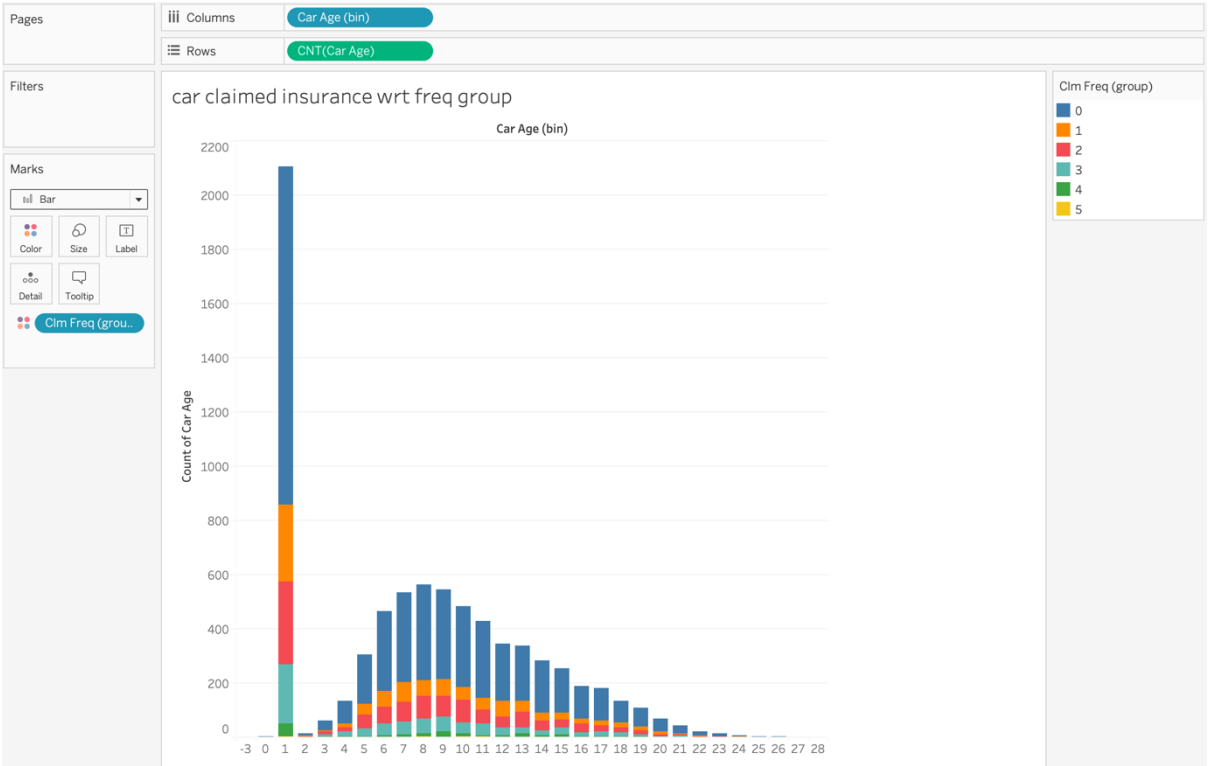
Dashboard Explained

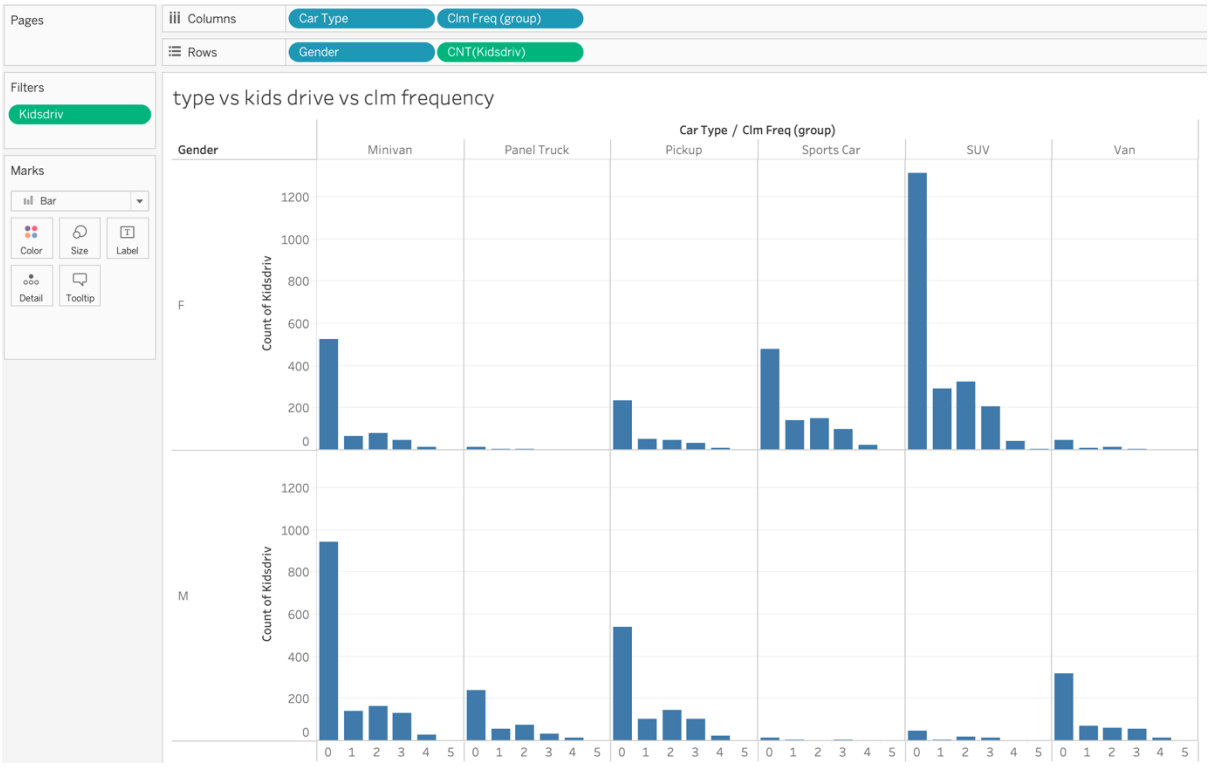

Pages
Columns
Clm Freq (group)
Rows
Gender
AVG(Clm Amt)
Filters
Amount claimed vs Frequency
Marks
Automatic
Color
Size
Label
Detail
Tooltip
CNT(Clm Freq)
Gen..
Clm Freq (group)
F
M
Avg. Clm Amt
2500
2000
1500
1000
500
0
0
1
2
3
4
5

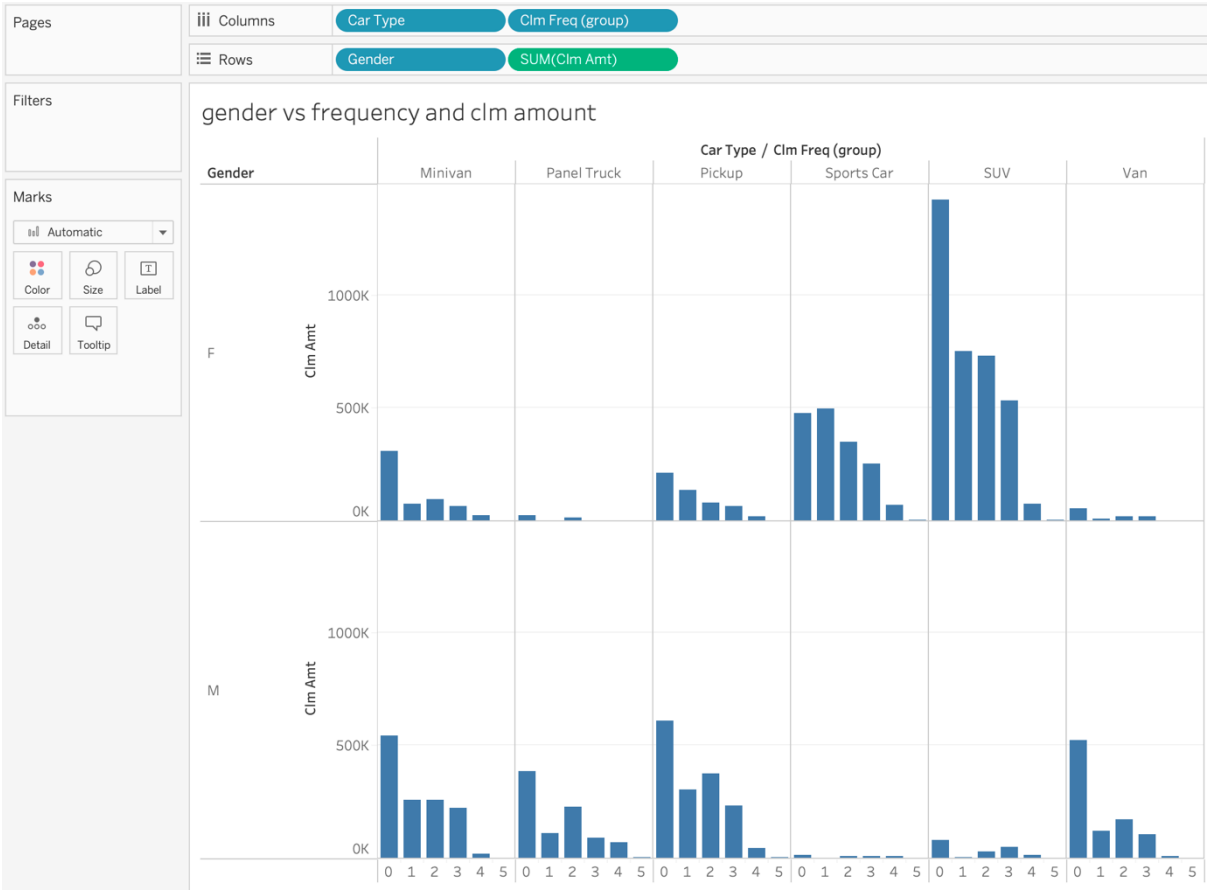

Pages
Columns
Age (bin)
Rows
Gender
AVG(Income)
Filters
Income with respect to age and gender
Mstatus
No
Yes
Marks
Area
Color
Size
Label
Detail
Tooltip
Mstatus
Gender
Age (bin)
F
M
Avg. Income
150K
100K
50K
0K
35
40
45
50
55
60
65
70
75
80
85
90

1. Majority of customer's **income range is less than 100K**. As the income level increases, the number of customers buying insurance seem to decrease. **Female have more income compared to male.**
2. Amongst those customer with insurance, **students and homemaker** are the larger group
3. From the result grid, it also looks like those who are **graduates of high school and Bachelors** believe in buying car insurance. I would think their income is low and they will need car insurance to help them if their car give problem or if they meet an accident.
4. The low income group has quite a large number of SUV and minivan. This could be due to the fact people use minivan as a delivery or passenger van for work. Alternatively, people who use SUV for Uber or Grab service.

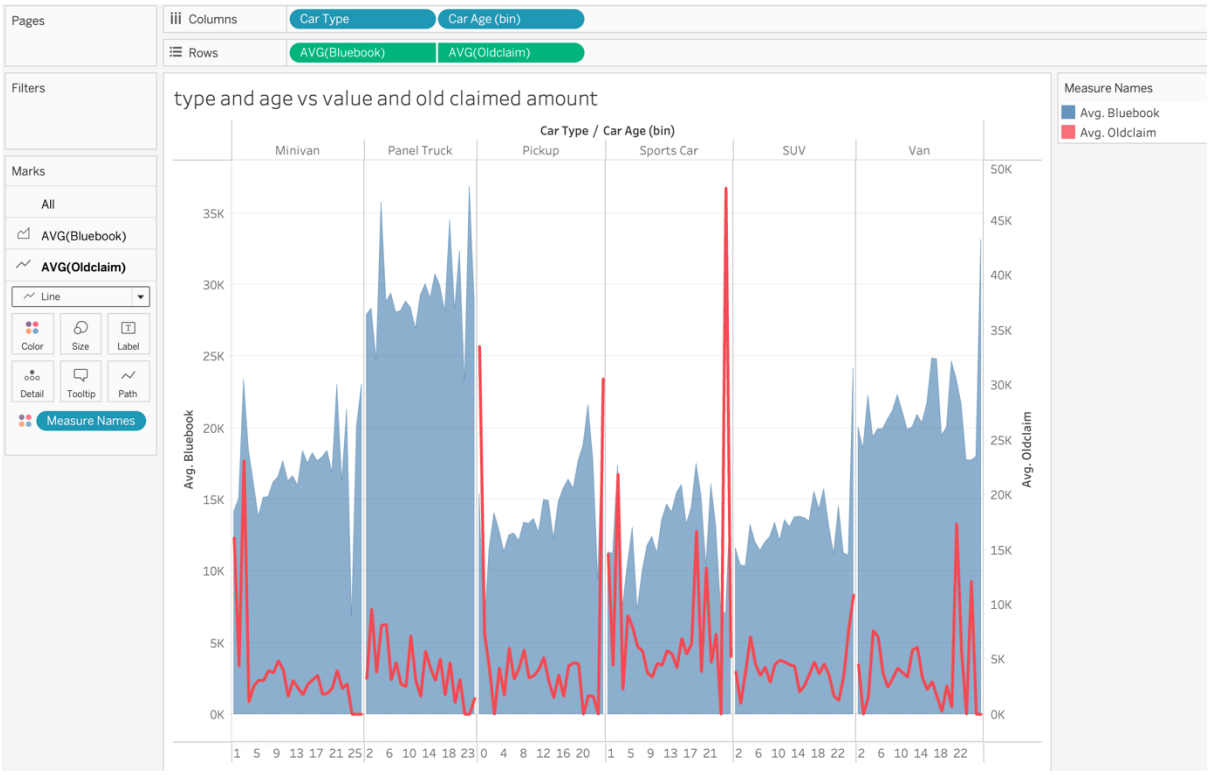

Pages
Columns
Car Age (bin)
Rows
SUM(Clm Amt)
Filters
Marks
Area
Color
Size
Label
Detail
Tooltip
Clm Freq (grou..
Measure Names
car age vs amount claimed
Car Age (bin)
Clm Amt
4000K
3500K
3000K
2500K
2000K
1500K
1000K
500K
0K
-3 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
Clm Freq (group). Meas...
0, Clm Amt
1, Clm Amt
2, Clm Amt
3, Clm Amt
4, Clm Amt
5, Clm Amt

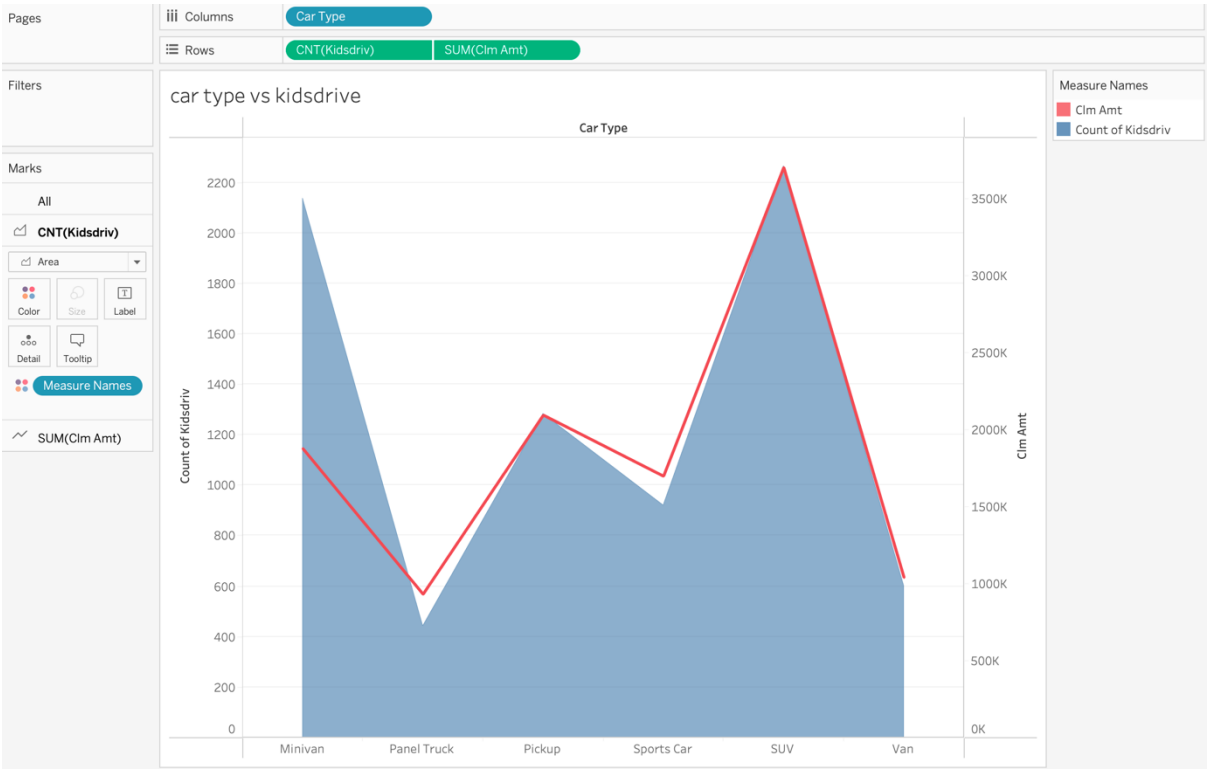

Pages
Columns
Car Age (bin)
Rows
CNT(Car Age)
Filters
Marks
Bar
Color
Size
Label
Detail
Tooltip
Clm Freq (grou..
car claimed insurance wrt freq group
Car Age (bin)
Count of Car Age
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-3 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
Clm Freq (group)
0
1
2
3
4
5

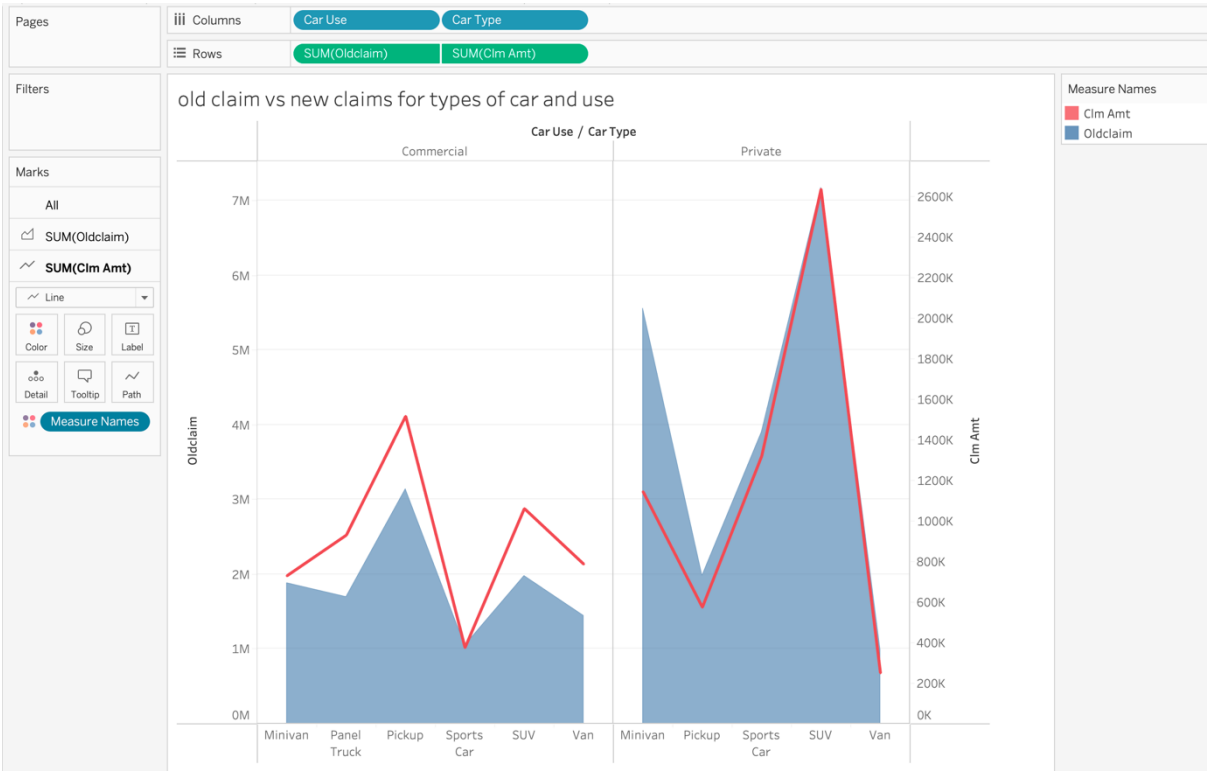

Pages
Columns
Car Type
Clm Freq (group)
Rows
Gender
CNT(Kidsdriv)
Filters
Kidsdriv
Marks
Bar
Color
Size
Label
Detail
Tooltip
type vs kids drive vs clm frequency
Car Type / Clm Freq (group)
Gender
Minivan
Panel Truck
Pickup
Sports Car
SUV
Van
F
M
Count of Kidsdriv
0
200
400
600
800
1000
1200
0 1 2 3 4 5


Pages
Columns
Car Type
Clm Freq (group)
Rows
Gender
SUM(Clm Amt)
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
gender vs frequency and clm amount
Car Type / Clm Freq (group)
Gender
Minivan
Panel Truck
Pickup
Sports Car
SUV
Van
F
M
Clm Amt
0K
500K
1000K
0 1 2 3 4 5

- It shows the female drivers dominates the purchasing of car insurance. More female drivers have Sports car and SUV, while the male may have to work hence minivan is more suitable for them.
- the evidence shows the lower educated one will have lower income range. Obviously those who study with higher education qualification will have higher income range.
- Panel trucks and minivans are comparatively priced higher while it also seems Sports car and SUV are more affordable. That explains why the lower income range people can afford to buy more SUV.
- SUV are the most preferred among female drivers while minivan are the preferred among male drives. This gives an understanding that women prefer compact cars more than do not spend much on cars. Panel trucks are used by male may be for work and commercial purpose.

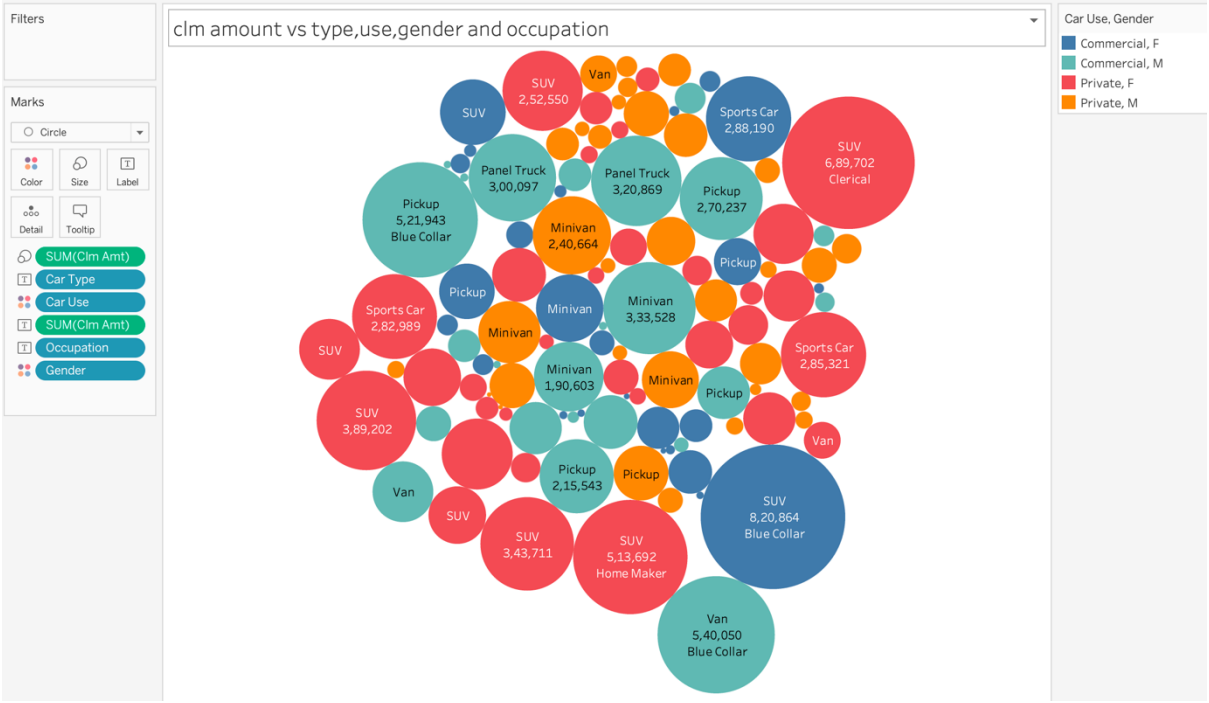


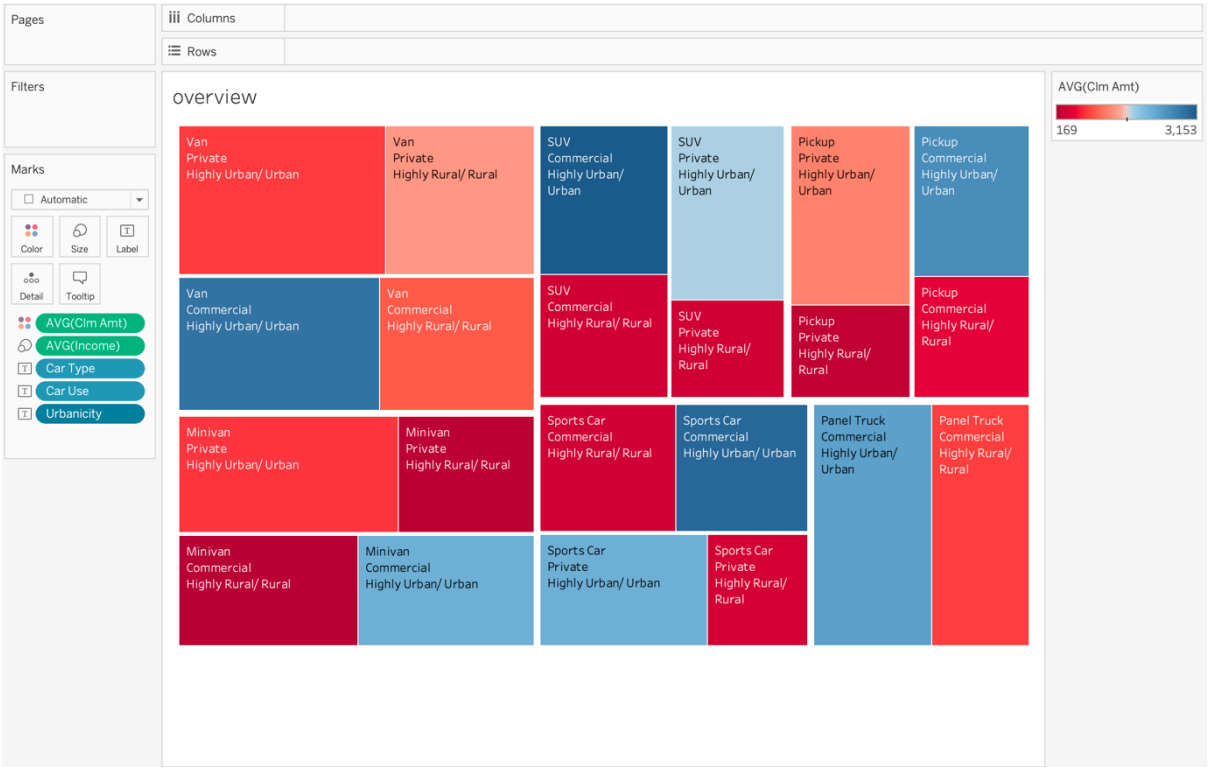




- As the car age increase, the car worth will decrease.
- The commercial vehicles such as panel truck remains high car worth after many years, probably they have more maintenance along the way and higher demand as it aged. Small business will look for cheaper minivan for startup business.

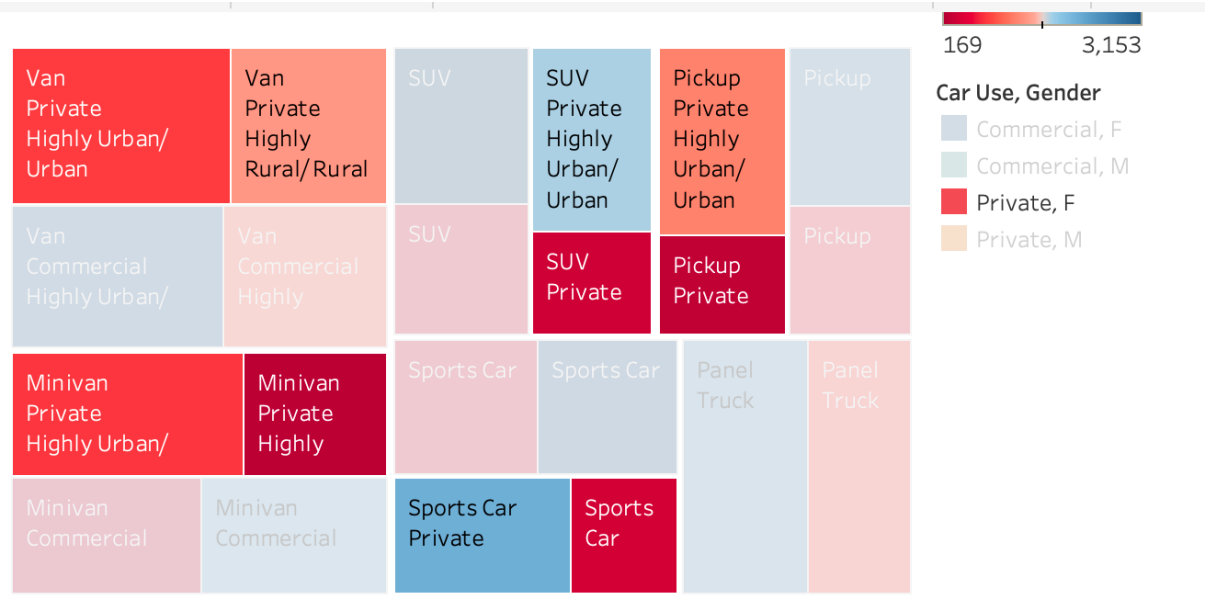
- Female married (of most occupation) dominates more than male married workers and they preferred driving bigger car. SUV is preferred over female while more male are driving minivan.
- SUV worth high when it is newly purchased and it dropped in value. Minivan, on the other hand, depreciates slower and still worth quite a lot as the years go by.

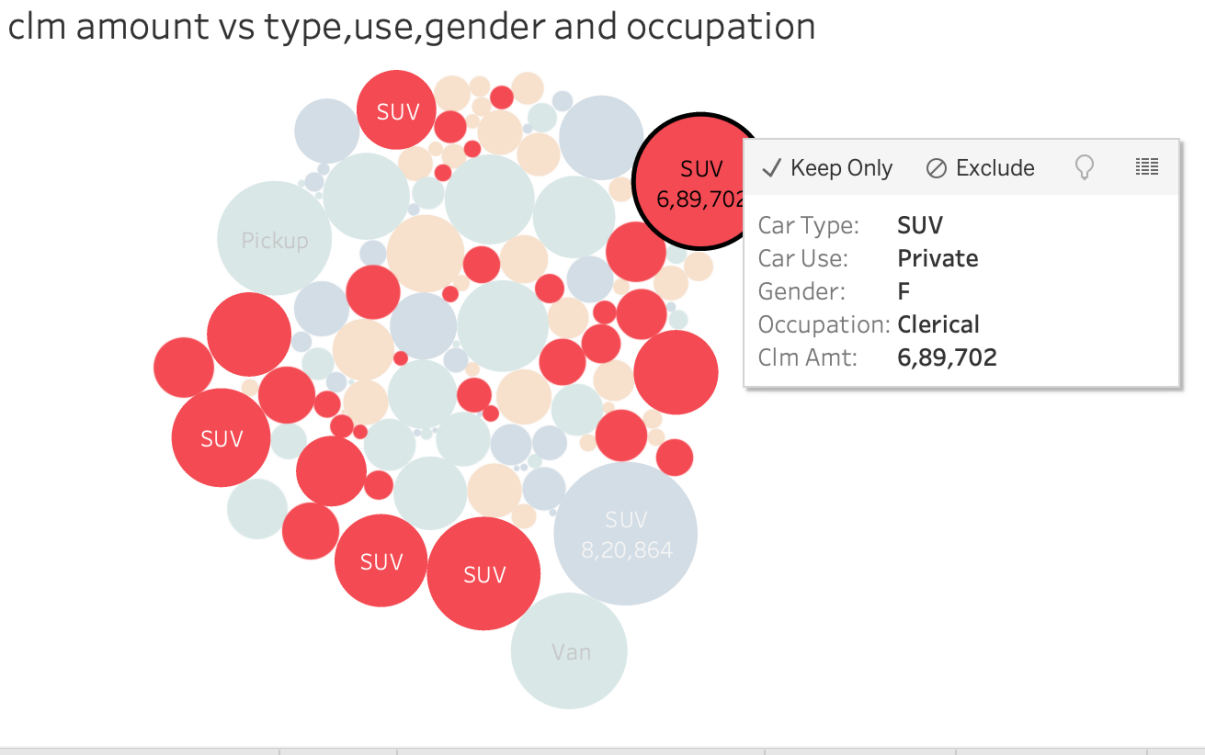




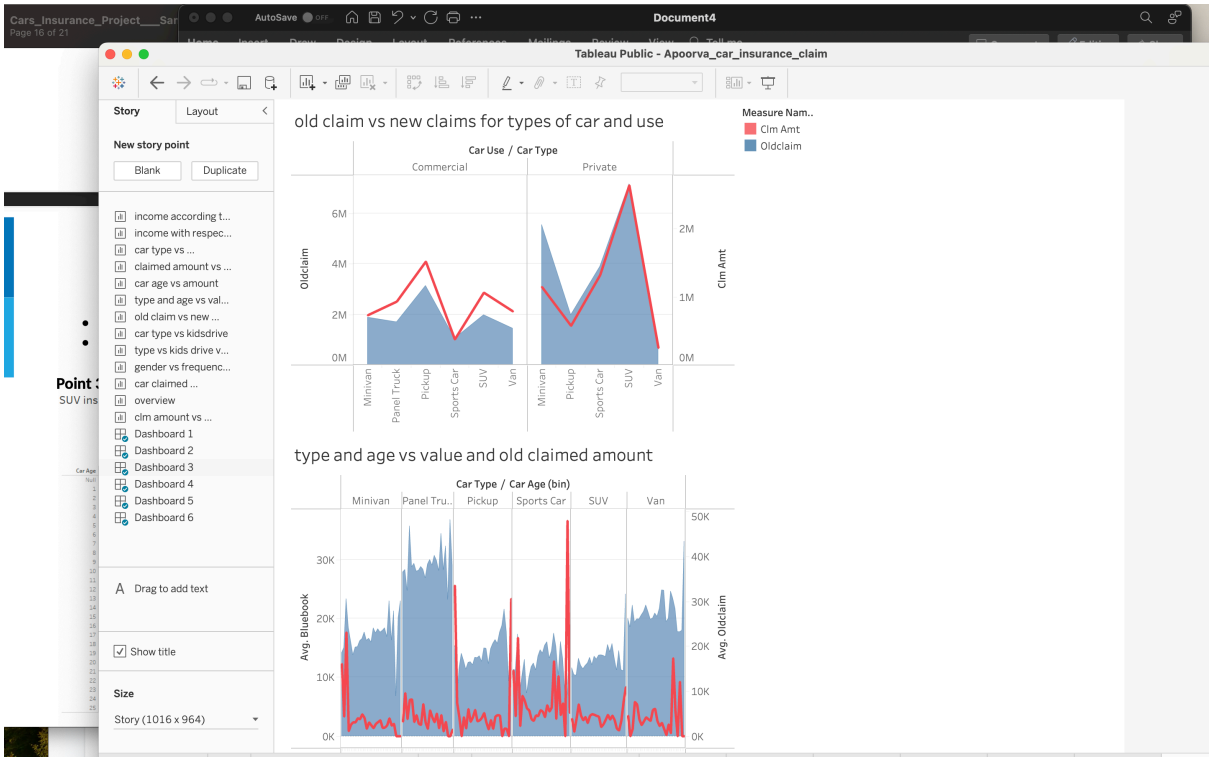
- Irrespective of occupation or income range, SUV and minivan are preferred vehicle type among customers.
- New SUV and Minivans have high amount of insurance claim. It is either the manufacturing is poor causing accident or the drivers are inexperience in handling the vehicle.
- Seems like all vehicles have been claiming insurance in their initial 2 years. Panel truck of 12 years also need to claim insurance. Top insurance claim car type include SUV, Pickup, Minivan, Sportscar and van (in descending order).
- Insurance is a must to purchase when the driver bought the vehicle. As the years go by, insurance is still require especially in the 10-12th year, where the vehicle is due to wear and tear, insurance will still be required.
- claiming of insurance happened in the initial years after purchasing the vehicle. Minivan has been consistently claiming insurance, perhaps due to faults or accidents, which is not a good sign for the insurance company.
- no matter what type of vehicle, the insurance is required. Especially when the vehicle is in to its 10th year, the claim of insurance is high.
- in the initial years when the car is worth high, the frequency of claiming insurance is also high.
- the type of car claiming most insurance is SUV, Pickup and Minivan.

Storyboard





- SUV is one of the most common cars bought among all type of income group.
- It shows it is affordable and female drivers especially love it.
- In terms of car worth, it is relatively high in value



- SUV has the highest amount of claim amount and based on previous claim one can easily determine the current claim amount
- Income range for female drivers is not high but they are the highest number of owners for SUV
- Regardless of occupation that the female drivers are, their preference car type is SUV
- throughout the life cycle of the SUV, there is high claim amount for the SUV insurance.

- The analysis also tell us that minivan and pickup(other than SUV) has the most number of male drivers, of which many are used for commercial purpose.
- As the car age increases for these 2 type of vehicles, the worth of the vehicles still remain high. This explains why male drivers are the dominant owners of these vehicle. They use the minivan and pickup for their work and the vehicle still worth some money along the years.
- The analysis of male customers owning the minivan and pickup dominates the car insurance company.
- From the income range, we can see that guys use this type of vehicle in their initial working years, probably they are setting some business or working as delivery initially. As the income increases, we can observe that the number of male drivers owning them decreases.

- We can also observe that the minivan and pickup car owners are mainly lower educated or lower income males, as I believe they are the ones who has stepped into the society to work.
- Claim value for minivan and pickup is extremely high in the initial years of the car life. This can be due to the inexperience driver that causes accident or repair to be done.
- Claim value remain high in the 7th year onwards, perhaps due to wear and tear of the vehicle.
- Among the male drivers, the minivan and pickup claim value is very high compare to the other vehicle types.
- It is also surprising to see sports car and SUV is really not popular among the male.
- his table shows the claim value of minivan and pickup is high in the initial years and the value will go down.
- However, it is not error-free as the insurance claim is still relatively high along the years.

Recommendations

Given the analysis of the client, car and insurance demographics, here are some recommendation for the company to improve their business. Recommendation is purely to introduce a more sustaining price table for their customers.

Price range for car types

- Insurance for SUV/Pickup/Minivan and Panel truck will be at higher premium

Based on Income range

- Insurance for lower income range should not be high as it will deter the customer from coming

Based on gender

- Insurance for female should be higher than male, however, that will be too obvious to be discrimination.

Based on past claims

- Insurance for customer with lower past claims should lead to lower premium, compare to customers who has incurred high past claims.

Based on car worth and car age

- Insurance for cars that are aging should have slightly lower premium than new cars

TABLEAU LINK

https://public.tableau.com/views/Apoorva_car_insurance_claim/Story1?:language=en-GB&:sid=&:display_count=n&:origin=viz_share_link