Data Visualization Using TABLEAU
Project Report

DSBA

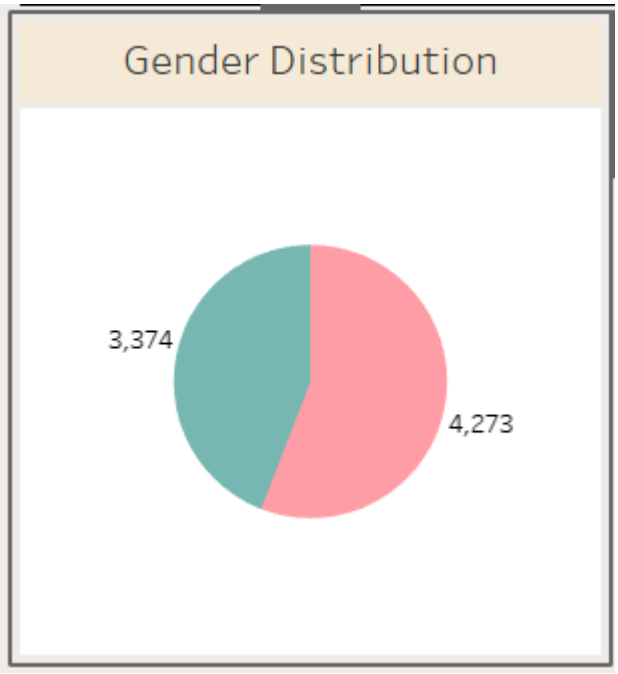
Contents-

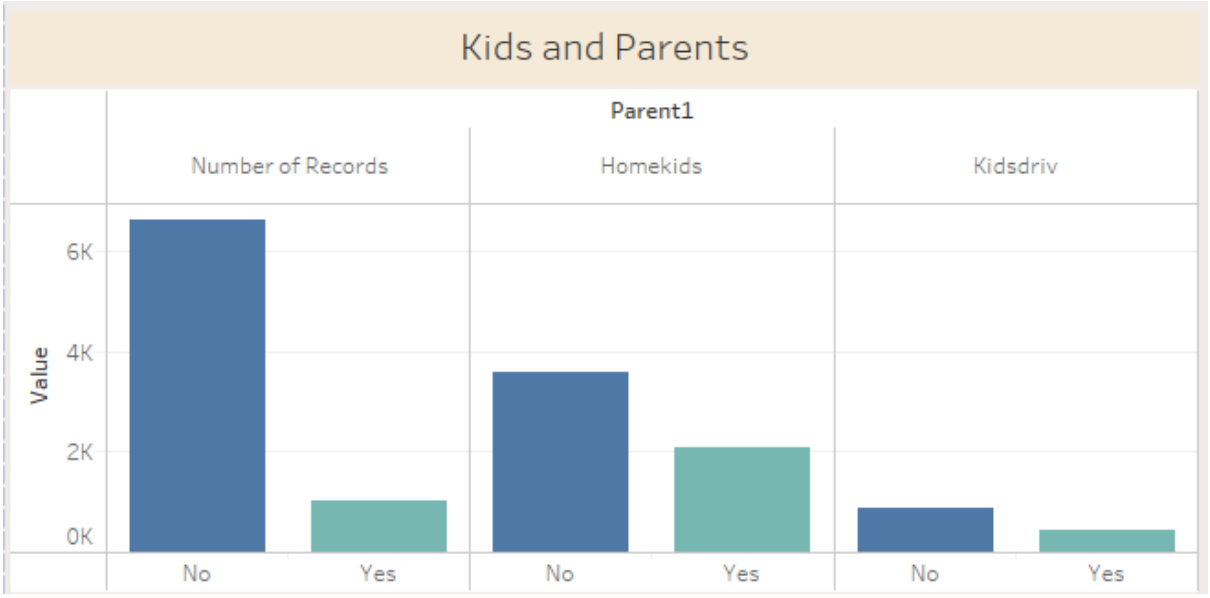
Problem……3
Q1.Creation of multiple charts and tables for representing useful insights/findings. The charts used should be inline with the objective that you wish to convey to the Senior Management……..…3-8
Q2.Creating a calculated field. The calculated field should add some meaningful value and should be inline with your storyboard which you will create in this project. Please make sure that you specify wherever calculated field has been used……8
Q3.Use filters, parameter, actions, etc in the charts so that it helps in understanding the data……8-10
Q4. Minimal clutter and consistency in use of colours across charts……10
Q5.Multiple Dashboards creation (Atleast 5 Dashboards).....10-13
Q6.Correct interpretations, insights are expected from each type of chart created. The interpretations should be inline with the storyboard which is to be created in this project……13-15
Q7.Interactivity among the charts on each Dashboard……..15
Q8.1 Storyboard Creation……15
Q9.Logical flow to the story represented in the storyboard……15-16
Q10.New dashboard which will cover the summary and the recommendations from the insights to be added to the end of the storyboard……..16

Problem-

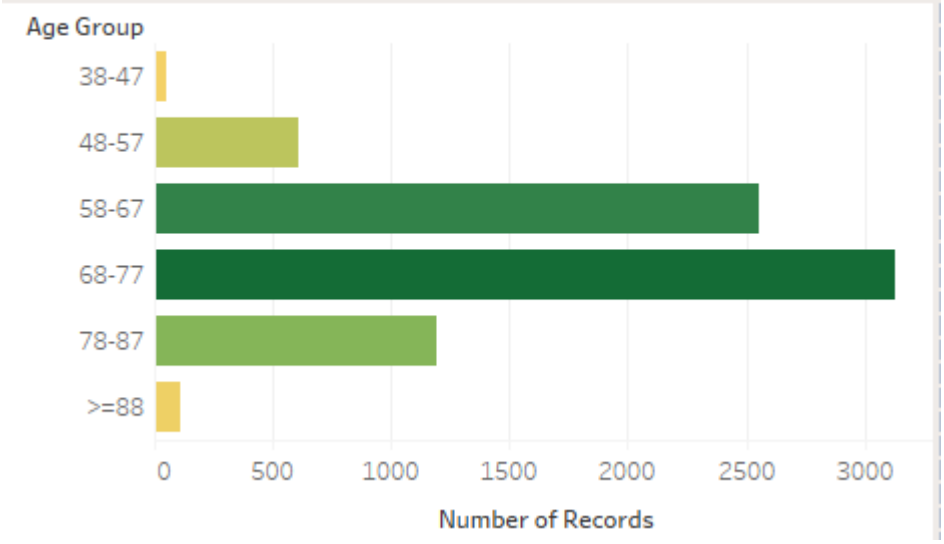
Consider that you are a Lead Data Analyst at an Insurance Claims company that has provided you with the Car Insurance Claims dataset. You have been given a task to explore the data, create different plots and interpret useful insights/findings. Your end goal here will be to create a storyboard that you 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 colour 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.

1.Creation of multiple charts and tables for representing useful insights/findings. The charts used should be inline with the objective that you wish to convey to the Senior Management.[Mandatory 8 types of charts/tables from any of the following: text table, bar chart(multiple/stacked/side by side), bubble chart, treemap, Pareto chart, scatterplot, Wordcloud, line plot, histogram, boxplot, circle views, heatmap, highlighted tables. No restrictions on the upper limit of the number of charts/tables to be used] .

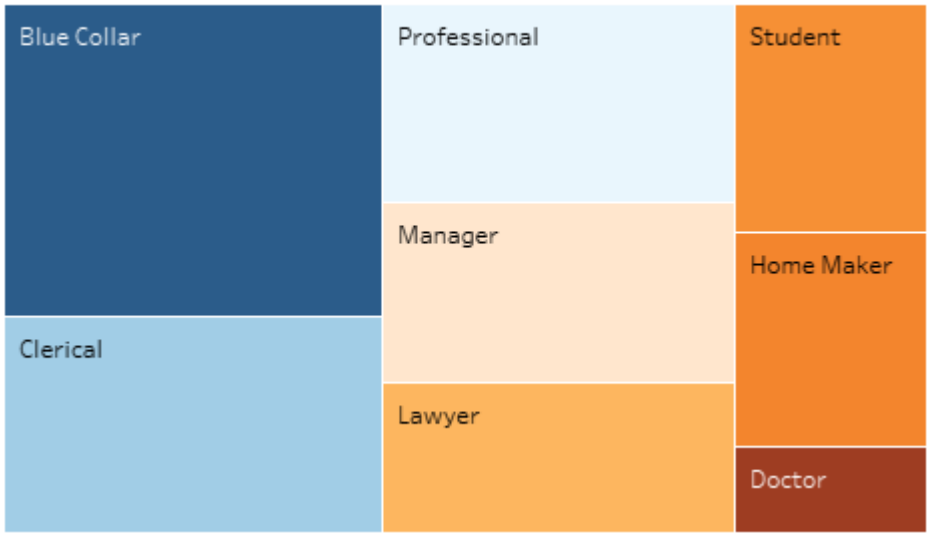

Gender Distribution
3,374
4,273


Kids and Parents
Parent1
Number of Records
Homekids
Kidsdriv
Value
6K
4K
2K
0K
No
Yes
No
Yes
No
Yes

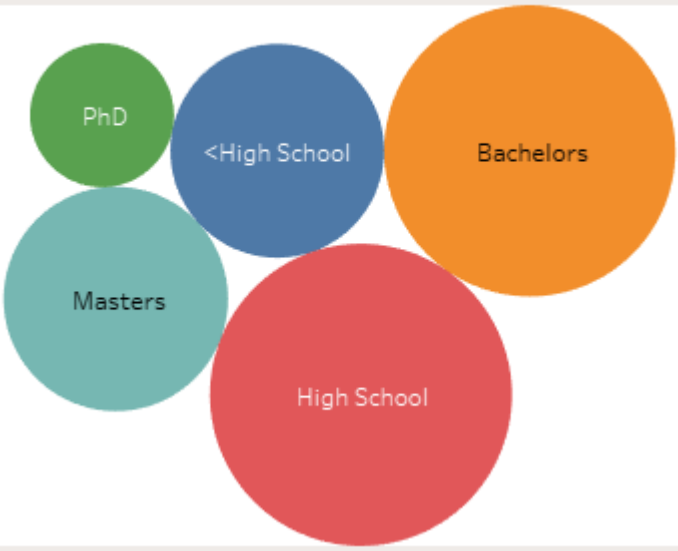
Age Group Distribution



Occupation Details

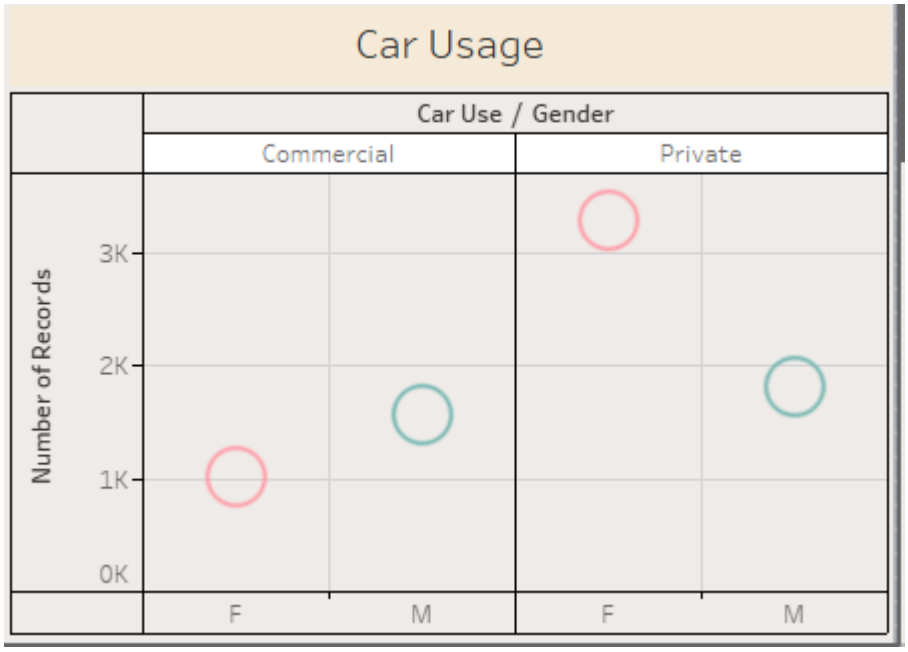


Education Details



Marital Status

Mstatus	
No	3,076
Yes	4,571



Car type

Car Type	
Minivan	2,136
Panel Truck	442
Pickup	1,283
Sports Car	920
SUV	2,264
Van	602

DATA UNDERSTANDING-

- **Pie Chart-** The Gender distribution shows female customer are more than the male customers.
- **Horizontal Bar Chart-** Most of the customers are from the age group of 48-77.
- **Side-by-Side Bar Graph-** Most of the parents don't have kids.
- **Tree Maps-** Majority of the customer occupation is Blue collar and the minority is doctors.
- **Bubble Chart-** Most of the customers have completed high school education and only few customers have completed PhD.

- **Highlight tables-** Majority of the customers are married.
- **Side-by-Side circle-** Private cars used by females are higher than the commercial.
- **Text Tables-** SUV is the most frequently used car type.

2. Creating a calculated field. The calculated field should add some meaningful value and should be inline with your storyboard which you will create in this project.Please make sure that you specify wherever the calculated field has been used.

➔ Rank is calculated manually by writing a formula given below to compute the Top N Ranks of the customer based on claim frequency.

RANK_UNIQUE(SUM([Clm Amt]),[Top/Bottom])

➔ Index is created using - **INDEX()**

➔ Age is calculated using -

if [Birth]>DATEADD('year',-DATEDIFF('year', [Birth],TODAY()),TODAY())THEN DATEDIFF('year',[Birth],TODAY())-1 ELSE DATEDIFF('year',[Birth],TODAY()) END

➔ Age Group is calculated using -

IF[Age]>=28 AND [Age]<=37 THEN "28-37" ELSEIF[Age]>=38 AND [Age]<=47 THEN "38-47" ELSEIF[Age]>=48 AND [Age]<=57 THEN "48-57" ELSEIF[Age]>=58 AND [Age]<=67 THEN "58-67" ELSEIF[Age]>=68 AND [Age]<=77 THEN "68-77" ELSEIF[Age]>=78 AND [Age]<=87 THEN "78-87" ELSEIF [Age]>=88 THEN ">=88" END

3. Use filters, parameters, actions, etc in the charts .

Parameters and Respective Calculated Fields-

- Top N- Current value:10
- Multi-Dimensional View- Education, car type, occupation, gender, parent1, mstatus, urbanity and car use.
- Multiple Parameters- Income, old claim and claim amount
- Claim Categories- contains car age, YOJ, claim frequency, homekids and kidsdriv columns.
- Claim Amount and Old claim – contains claim amount and old claim amount column.

- Claim Amount and Claim Frequency – contains claim amount and claim frequency columns.

Claim based on multiple categories -

CASE [Claim Categories] WHEN "Car Ages" THEN[Car Age] WHEN "YOJ" THEN [YOJ] WHEN "Claimed Frequency" THEN [Clm Freq] WHEN "Homekids" THEN [Homekids] WHEN "Kidsdriv" THEN [Kidsdriv] END

Claim based on multiple dimensions-

CASE [Multi-Dimensional View] WHEN "Education" THEN [Education] WHEN "Car Type" THEN [Car Type] WHEN "Occupation" THEN [Occupation] WHEN "Car Use" THEN [Car Use] WHEN "Gender" THEN [Gender] WHEN "Parent1" THEN [Parent1] WHEN "Mstatus" THEN [Mstatus] WHEN "Urbanicity" THEN [Urbanicity] END

Claim Amount and Old Claim-

CASE [Parameters].[Claimed & Old Claim] WHEN "Clm Amt" THEN [Clm Amt] WHEN "Oldclaim" THEN [Oldclaim] END

Claim Amount and Claim Frequency-

CASE [Claim Amt & Freq] WHEN "Clm Amt" THEN [Clm Amt] WHEN "Clm Freq" THEN [Clm Freq] WHEN "Oldclaim" THEN [Oldclaim] END

Top N-

[Rank]<=[Top N]

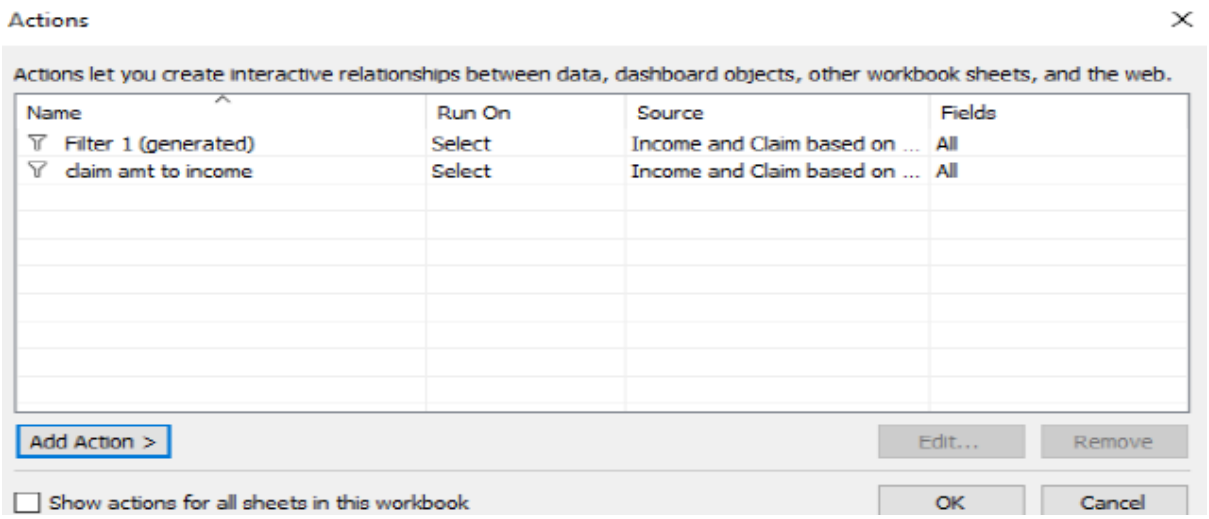
Multiple Parameters-

CASE [Multi Param] WHEN "Oldclaim" THEN [Oldclaim] WHEN "Income" THEN [Income] WHEN "Clm Amt" THEN [Clm Amt] END

FILTERS:

- **ID**
- **Education**
- **Occupation**
- **Car Type**

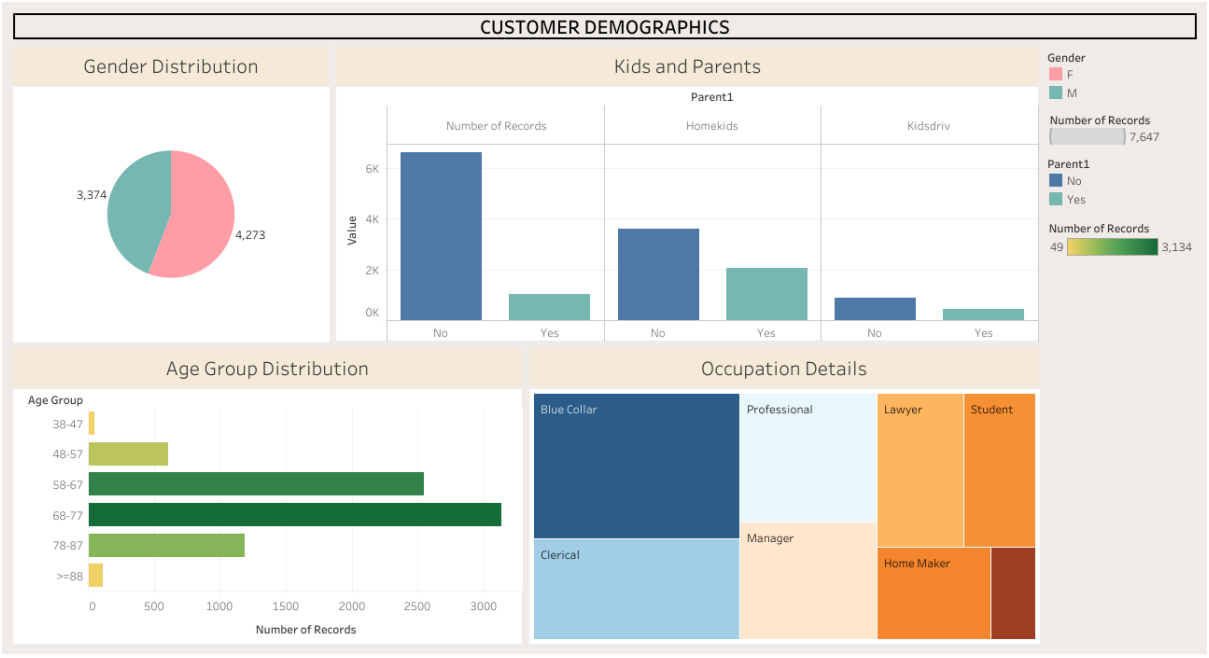
ACTIONS-



4. Minimal clutter and consistency in use of colours across charts.

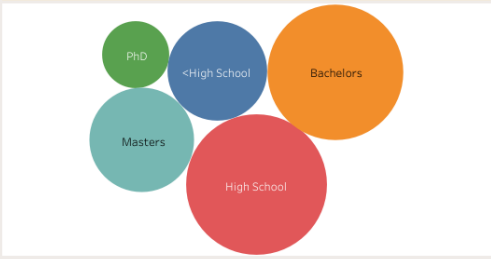
All the charts are made with colour code based on various features. For eg: Chart created based on claimed amount and car age, but the colour frequency was given based on the travel time.

5.Multiple Dashboards creation (At least 5 Dashboards).



Customer Demographics

Education Details



Marital Status

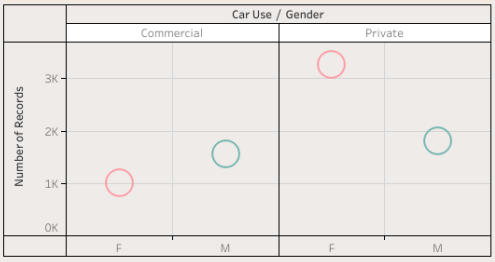
Mstatus	
No	3,076
Yes	4,571

Education
- <High School
- Bachelors
- High School
- Masters
- PhD

Number of Records
3,076 — 4,571

Gender
- F
- M

Car Usage



Car type

Car Type	
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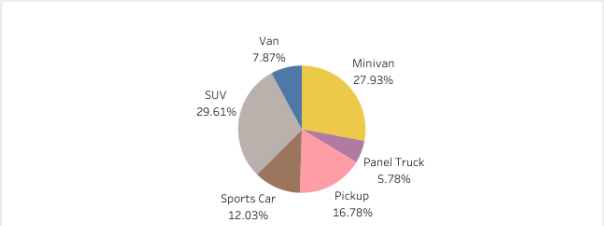
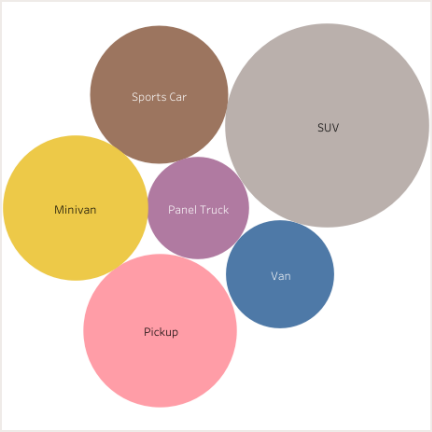
Panel Truck	442
Pickup	1,283
Sports Car	920
SUV	2,264
Van	602

Income and Claim Distribution based on Car Type

% of Customers Based on Car Type



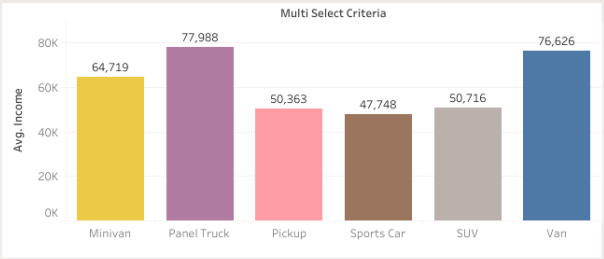
Claim Amount based on Car Type



Multi Select Criteria
- Minivan
- Panel Truck
- Pickup
- Sports Car
- SUV
- Van

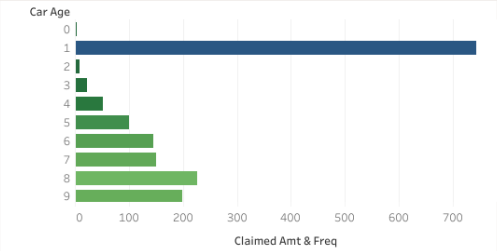
Number of Records
7,647

Income Based on Car Type

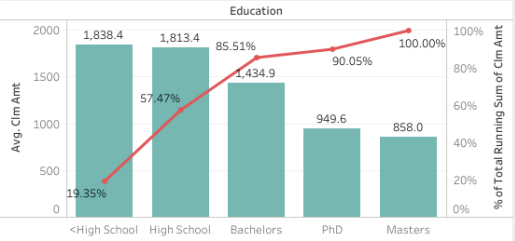


Claim Distribution based on claim Frequency, Education, Kids and Car type

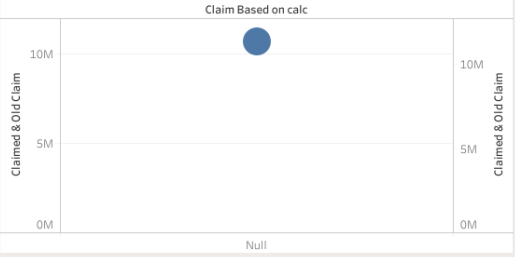
Claim Amt and Frequency



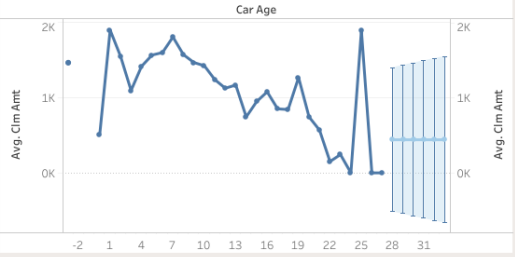
Claim Amount and Education



Claim Amount on kids



Claim based on car age



Car Type
Multiple values

Travtime
38 30,227

Claim Amt & Freq
Clm Freq

Education
All

Measure Names
% of Total Running S..
Avg. Clm Amt

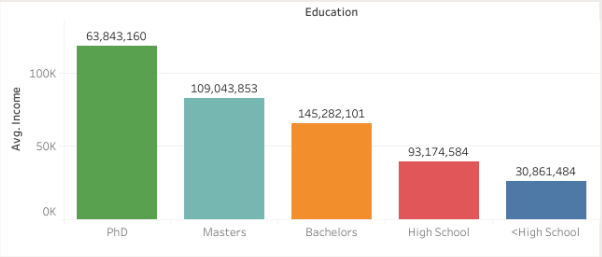
Claim Categories
Clm Freq

Claimed & Old Claim
Clm Amt

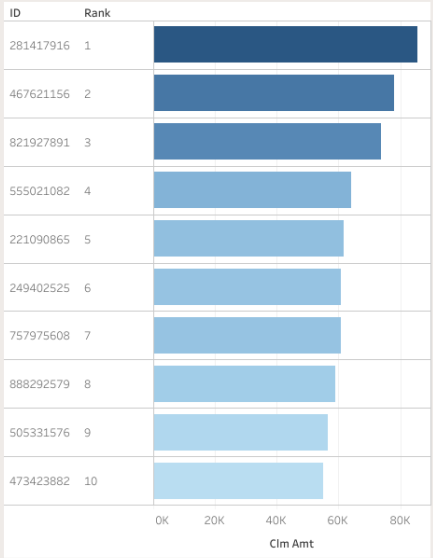
Forecast indicator
Actual
Estimate

Income Distribution Based on Education, Car Type and Top Claims

Income and Education



Top N



Education
PhD
Masters
Bachelors
High School
<High School

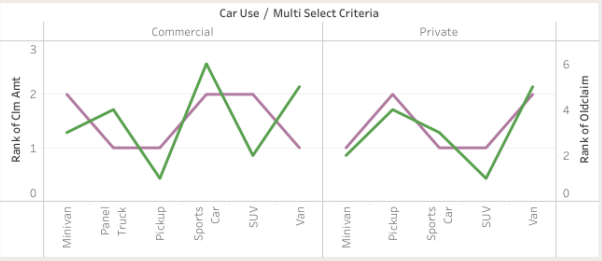
Clm Amt
54,928 85,524

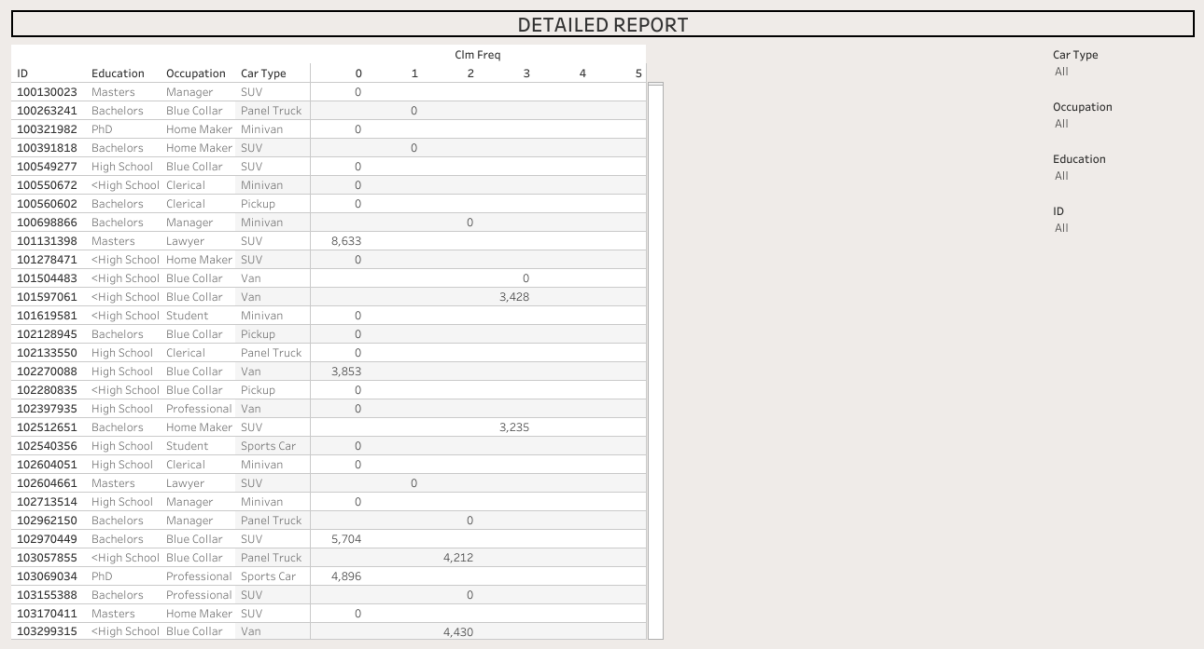
Top N
10

Measure Names
Rank of Clm Amt alon..
Rank of Oldclaim alon..

Multi Dimensional View
Car Type

Rank and Educations





DETAILED REPORT

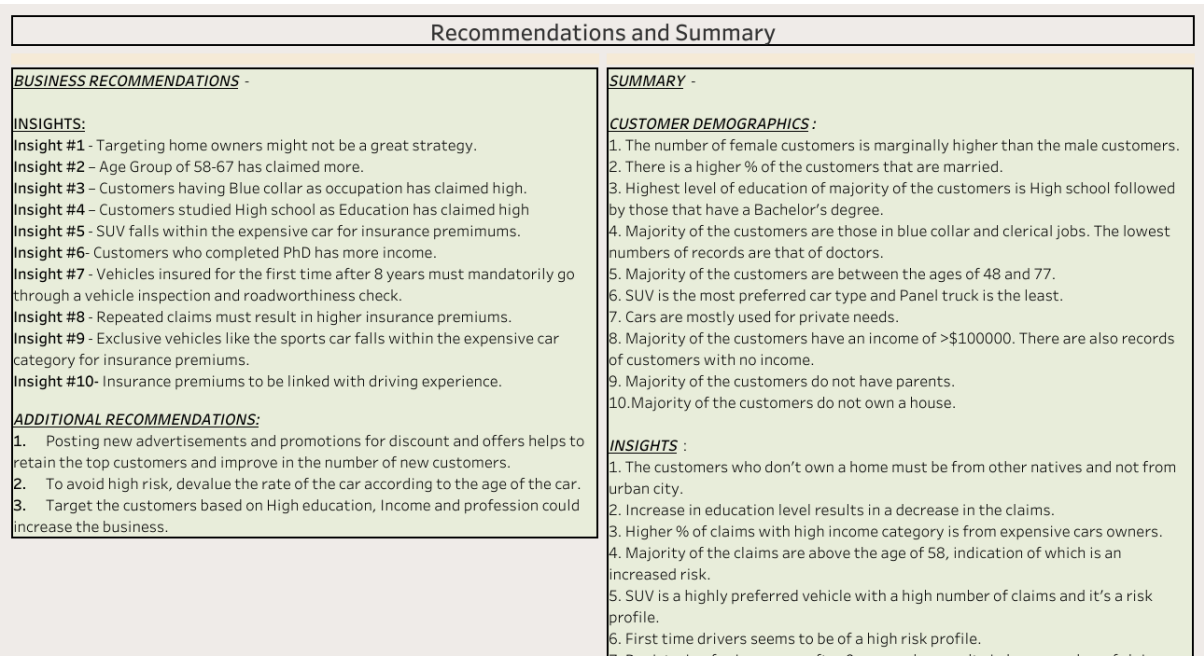
ID	Education	Occupation	Car Type	Clm Freq 0	1	2	3	4	5
100130023	Masters	Manager	SUV	0					
100263241	Bachelors	Blue Collar	Panel Truck		0				
100321982	PhD	Home Maker	Minivan	0					
100391818	Bachelors	Home Maker	SUV		0				
100549277	High School	Blue Collar	SUV	0					
100550672	<High School	Clerical	Minivan	0					
100560602	Bachelors	Clerical	Pickup	0					
100698866	Bachelors	Manager	Minivan			0			
101131398	Masters	Lawyer	SUV	8,633					
101278471	<High School	Home Maker	SUV	0					
101504483	<High School	Blue Collar	Van				0		
101597061	<High School	Blue Collar	Van				3,428		
101619581	<High School	Student	Minivan	0					
102128945	Bachelors	Blue Collar	Pickup	0					
102133550	High School	Clerical	Panel Truck	0					
102270088	High School	Blue Collar	Van	3,853					
102280835	<High School	Blue Collar	Pickup	0					
102397935	High School	Professional	Van	0					
102512651	Bachelors	Home Maker	SUV				3,235		
102540356	High School	Student	Sports Car	0					
102604051	High School	Clerical	Minivan	0					
102604661	Masters	Lawyer	SUV		0				
102713514	High School	Manager	Minivan	0					
102962150	Bachelors	Manager	Panel Truck			0			
102970449	Bachelors	Blue Collar	SUV	5,704					
103057855	<High School	Blue Collar	Panel Truck			4,212			
103069034	PhD	Professional	Sports Car	4,896					
103155388	Bachelors	Professional	SUV			0			
103170411	Masters	Home Maker	SUV	0					
103299315	<High School	Blue Collar	Van			4,430			

Car Type
All

Occupation
All

Education
All

ID
All



Recommendations and Summary

BUSINESS RECOMMENDATIONS -

INSIGHTS:
Insight #1 - Targeting home owners might not be a great strategy.
Insight #2 – Age Group of 58-67 has claimed more.
Insight #3 – Customers having Blue collar as occupation has claimed high.
Insight #4 – Customers studied High school as Education has claimed high
Insight #5 - SUV falls within the expensive car for insurance premimums.
Insight #6- Customers who completed PhD has more income.
Insight #7 - Vehicles insured for the first time after 8 years must mandatorily go through a vehicle inspection and roadworthiness check.
Insight #8 - Repeated claims must result in higher insurance premiums.
Insight #9 - Exclusive vehicles like the sports car falls within the expensive car category for insurance premiums.
Insight #10- Insurance premiums to be linked with driving experience.

ADDITIONAL RECOMMENDATIONS:
1. Posting new advertisements and promotions for discount and offers helps to retain the top customers and improve in the number of new customers.
2. To avoid high risk, devalue the rate of the car according to the age of the car.
3. Target the customers based on High education, Income and profession could increase the business.

SUMMARY -

CUSTOMER DEMOGRAPHICS :
1. The number of female customers is marginally higher than the male customers.
2. There is a higher % of the customers that are married.
3. Highest level of education of majority of the customers is High school followed by those that have a Bachelor's degree.
4. Majority of the customers are those in blue collar and clerical jobs. The lowest numbers of records are that of doctors.
5. Majority of the customers are between the ages of 48 and 77.
6. SUV is the most preferred car type and Panel truck is the least.
7. Cars are mostly used for private needs.
8. Majority of the customers have an income of >$100000. There are also records of customers with no income.
9. Majority of the customers do not have parents.
10. Majority of the customers do not own a house.

INSIGHTS :
1. The customers who don't own a home must be from other natives and not from urban city.
2. Increase in education level results in a decrease in the claims.
3. Higher % of claims with high income category is from expensive cars owners.
4. Majority of the claims are above the age of 58, indication of which is an increased risk.
5. SUV is a highly preferred vehicle with a high number of claims and it's a risk profile.
6. First time drivers seems to be of a high risk profile.

7 Dashboards were created.

6. Correct interpretations, insights are expected from each type of chart created. The interpretations should be inline with the storyboard which is to be created in this project.These interpretations can be in the captions of the storyboard or in the plots as well.

INSIGHTS-

Insight #1 - Targeting homeowners might not be a great strategy

Insight #2 – The Age Group of 58-67 has claimed more.

Insight #3 – Customers having a Blue collar occupation have claimed high.

Insight #4 – Customers studied High school as Education has claimed high
Insight #5 - SUV falls within the expensive car for insurance premiums
Insight #6- Customers who have completed a PhD have more income.
Insight #7 - Vehicles insured for the first time after 8 years must mandatorily go through a vehicle inspection and roadworthiness check.
Insight #8 - Repeated claims must result in higher insurance premiums.
Insight #9 - Exclusive vehicles like the sports car fall within the expensive car category for insurance premiums.
Insight #10- Insurance premiums to be linked with driving experience

ADDITIONAL RECOMMENDATIONS-

1. Posting new advertisements and promotions for discounts and offers helps to retain the top customers and improve the number of new customers.
2. To avoid high risk, devalue the rate of the car according to the age of the car.
3. Target the customers based on High education, Income and profession could increase the business.

SUMMARY-

1. The number of female customers is marginally higher than the male customers.
2. There is a higher % of the customers that are married.
3. Highest level of education of the majority of the customers is High school followed by those that have a Bachelor's degree.
4. Majority of the customers are those in blue collar and clerical jobs. The lowest numbers of records are that of doctors.
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10. Majority of the customers do not own a house.

INSIGHTS-

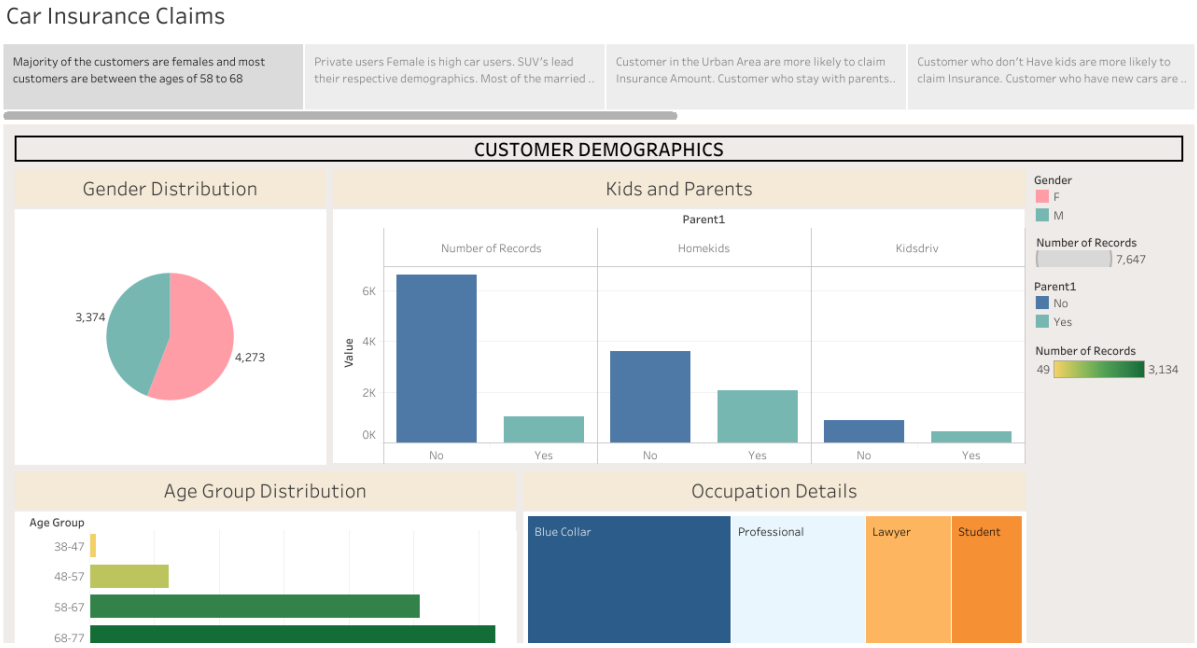
1. The customers who don't own a home must be from other natives and not from urban cities.
2. Increase in education level results in a decrease in the claims.
3. Higher % of claims with high income category is from expensive cars owners.

4. Majority of the claims are above the age of 58, indicating an increased risk.
5. SUV is a highly preferred vehicle with a high number of claims and it's a risk profile.
6. First time drivers seem to be of a high risk profile.
7. Registering for insurance after 9 years, also results in a large number of claims.
8. Increased claim frequencies from the same customers indicate high risk.

7. Interactivity among the charts on each Dashboard.

The dashboard Income and claim based on multiple categories and dimensions is interactive. Once you click on a particular category in a variable, the rest of the following charts will be coming based on the above selection. Also the storyboard is interactive. We can move from one dashboard to the other dashboards by clicking on the story.

8. 1 Storyboard Creation.



9. Logical flow to the story represented in the storyboard.

- Initial step is to understand the data by showing the demographics of the customers by Gender, Education, Age, Parents and Kids, Occupation details, Marital status, car usage and car type.
- Followed by visualising the claim amount, income and % of customers based on Gender, Education, Age, Parents, Urbanicity, Occupation details, Marital status, car usage and car type. We can drill down the level and see.

- The claim distribution is shown for car age based on claim amount and claim frequency.
- Claim amount based on Education level and car age.
- Income based on Education is shown.
- Claim amount and old claim amount is compared based on having kids and parenting, YOJ, Claim frequency and car age.
- Car usage based on multiple categories like Gender, Education, Age, Parents, Urbanicity, Occupation details, Marital status, car usage and car type.
- Top N ranks of the ID is shown to know the top customers.
- Detailed Reports of the data are clearly shown.
- Finally, the insights, summary and business recommendations are given.

10. New dashboard which will cover the summary and the recommendations from the insights to be added to the end of the storyboard.

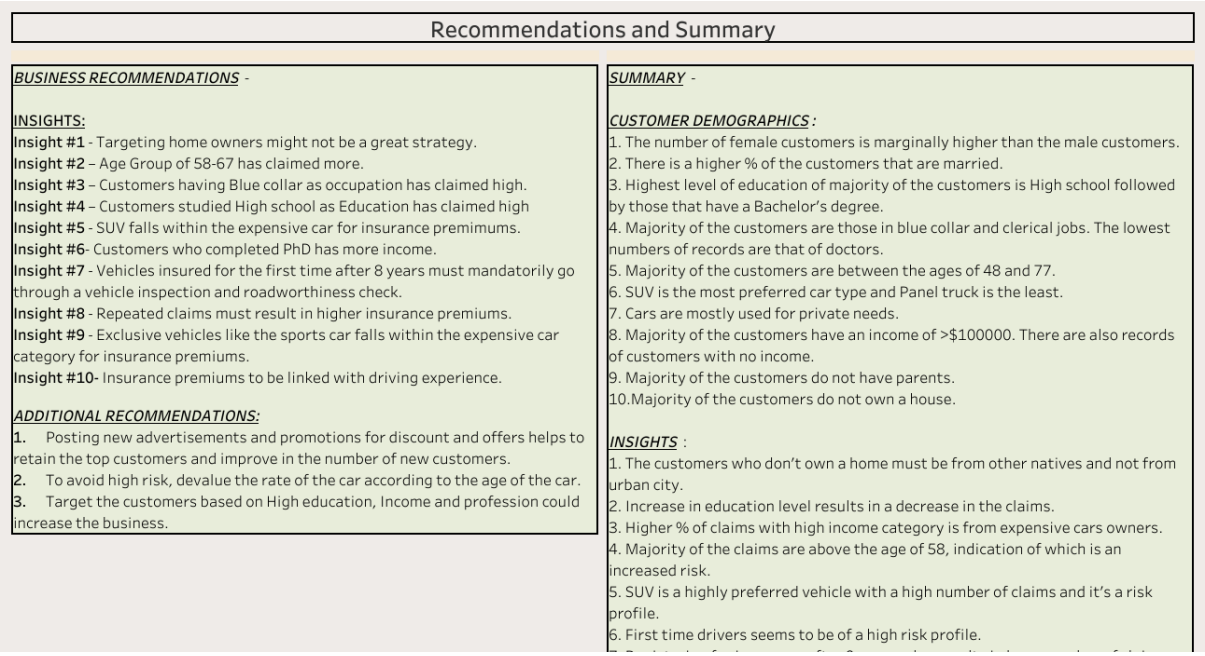


Tableau Public Link-

GL Project File | Tableau Public