



Car Insurance Company

"Understanding Your Customers"

— Presented by Brenna Yin, Yijun Yang



Purpose of Our Study



- Understanding this industry;
- What kinds of customers you are facing;
- What you should care about as a “Green Hand”;
- A valuable Scoring System we introduce;
- Prepare to **MAKE SOME GREAT MONEY!**

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Data Overview

Get to know the insurance data

02

Selecting Features

Focus on Important Variables

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Customers

Zero-Claim Customers
vs.
Claimed Customers

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Takeaways

Summary & Inspiration



01

DATA OVERVIEW

What are the data a car insurance company often has?

1.1 Features and Claims



type	color	use	value	...
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age	occupation	marital status	education	#children	gender	income	home value
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**Total Claim
Amount 5y**

\$11.33M

**Avg Claim
Amount**

\$1481

**Total Claim
Number 5y**

#6046

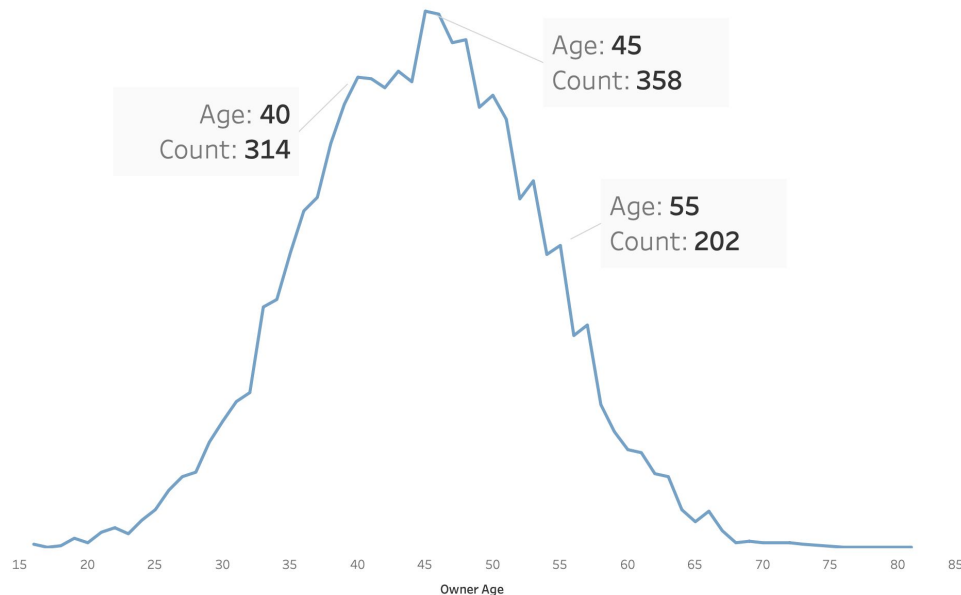
**Avg Claim
Number**

#0.79

1.2 Customers Profile



High School	3,573
Bachelors	2,217
Masters	1,317
PhD	543



1.3 Scoring System

For one Customer Profile, exam these following features*:

Young Age?



Used Car?



Male?



Children?



Sports Car ?



*These are example features for illustration.

*Not the results from this project.

Total 3/5 Points



02

Selecting Features

What are the features that affect the claimed rate?



Advantage of Categorical Features

- Easy to collect;
- Easy to process;
- Easy to score;

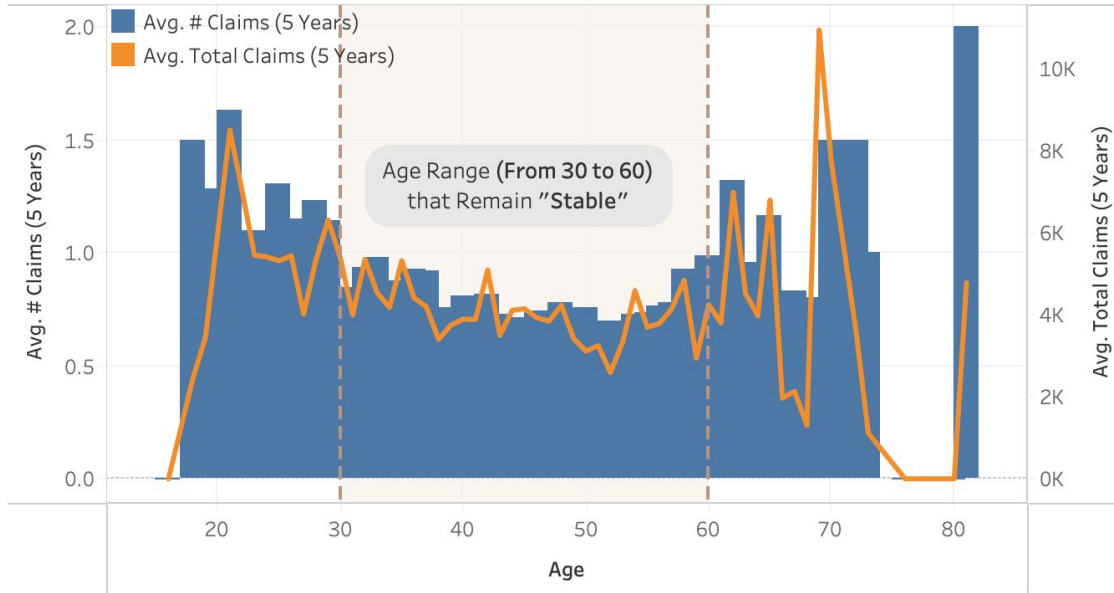
So why not all using categorical features?



Numerical Feature – Age

– Try to identify the “threshold”

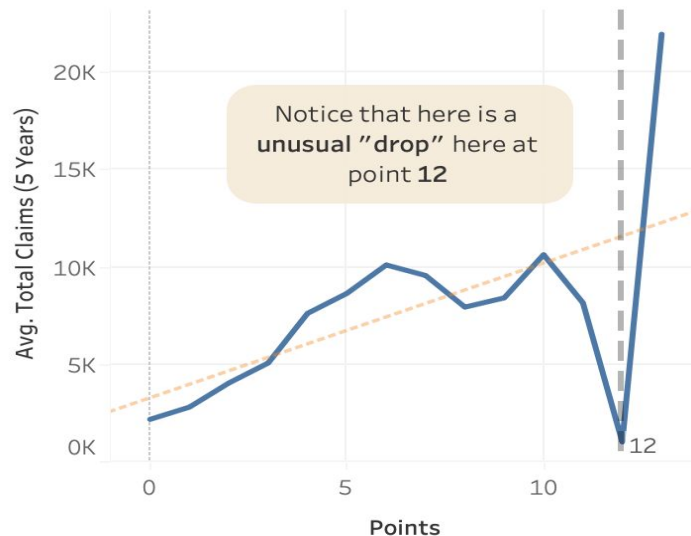
Distribution by Age



- High risk, unstable among young and elder age group;
- Low risk, stable among middle age group
- **Proper shreshold – Age 30 and Age 60**



Points VS. Total Claims

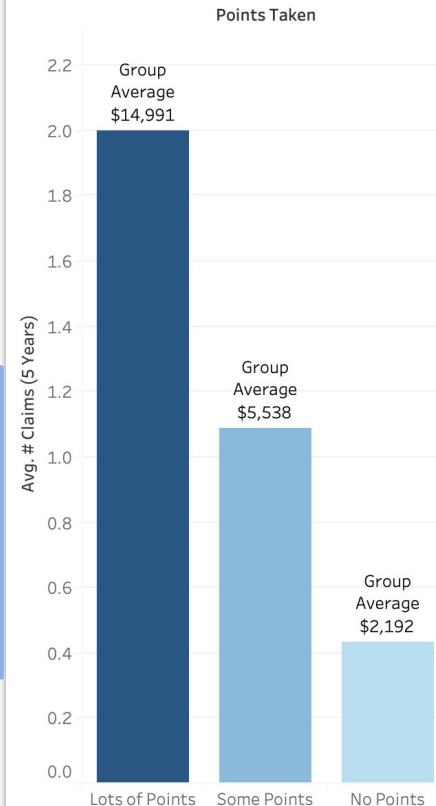


The trend of average of Total Claims (5 Years) for Points.

- "Flat" increase before 12;
- "Threshold" as "0" and "12"

1. 0 → No Points
2. 0~12 → Some Points
3. 12+ → Lots of Points

Claims by Points Taken



Average of # Claims (5 Years) for each Points Taken. Color shows average of Total Claims (5 Years). The marks are labeled by average of Total Claims (5 Years).

Avg. Total Claims (5 Ye..



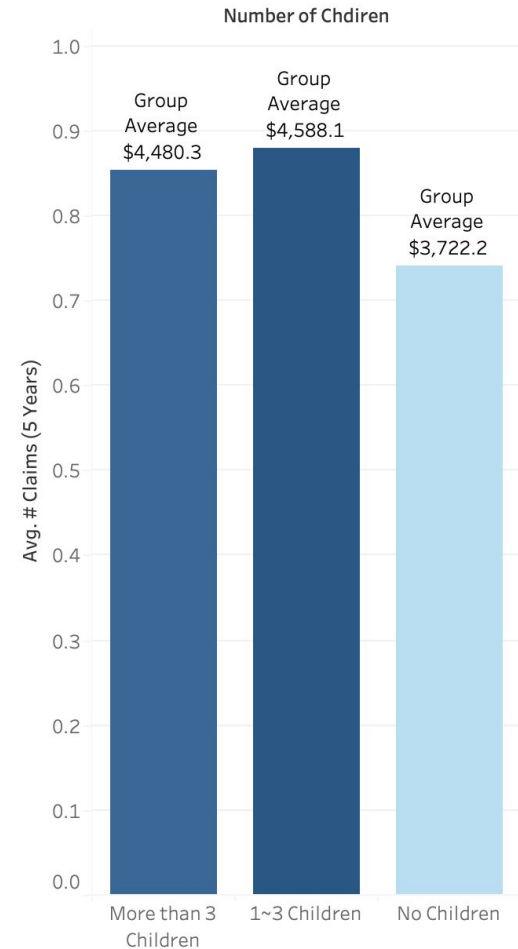
Numerical Feature – Points Taken

Numerical Feature – Number of Children

Common Family:
3 children or less

Threshold: 0 and 3

Claims by Different Number of Children



Summary

Numerical → Categorical

Age

Young – 0 ~ 30
Middle – 30 ~ 60
Elder – 60 +

Points Taken

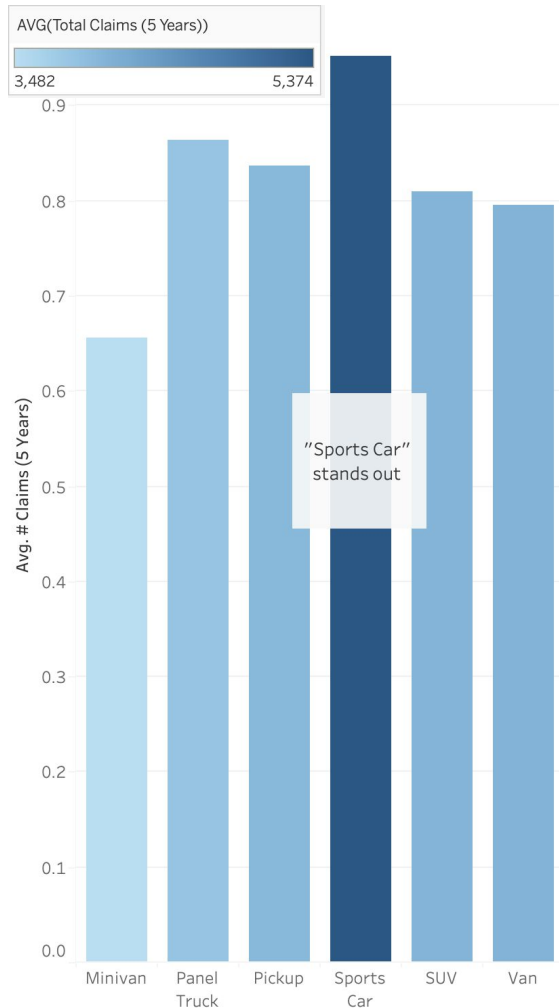
No Points – 0
Some Points – 0 ~ 12
Lots of Points – 12 +

Number of Children

No Children – 0
1 ~ 3 Children – 1 ~ 3
More than 3 Children – 3 +



Average Total Claims by Vehicle Type



Simplify Complex Categorical – Vehicle Type

Apparently only "Sports car" matters!!

Simplify our feature
– Only consider if it's a
Sports car or not

Summary

Numerical together with Categorical

Age

Young – 0 ~ 30
Middle – 30 ~ 60
Elder – 60 +

Points Taken

No Points – 0
Some Points – 0 ~ 12
Lots of Points – 12 +

Number of Children

No Children – 0
1 ~ 3 Children – 1 ~ 3
More than 3 Children – 3 +

Sports Car?

Yes / No

Vehicle Use

Private / Commercial

License Revoked?

Yes / No



Age

Young – 0 ~ 30
Middle – 30 ~ 60
Elder – 60 +

Points Taken

No Points – 0
Some Points – 0 ~ 12
Lots of Points – 12 +

Number of Children

No Children – 0
1 ~ 3 Children – 1 ~ 3
More than 3 Children – 3 +

Sports Car?

Yes / No

Vehicle Use

Private / Commercial

License Revoked?

Yes / No



03

Customers

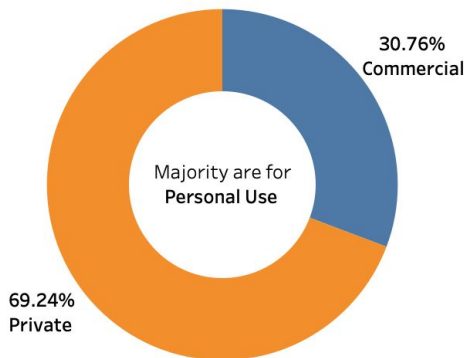
Who are more likely to file a claim?
Who are not?



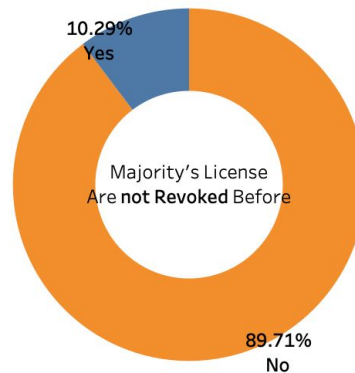
Analyze Clients Have 0 Claims

Groups Without Further Processed

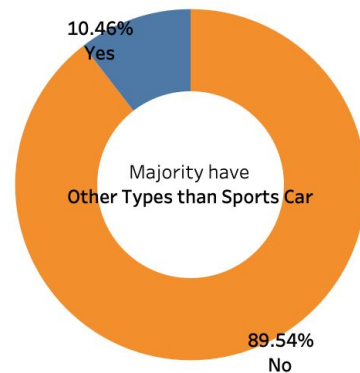
Vehicle Use



License Revoked? (Within 7 years)

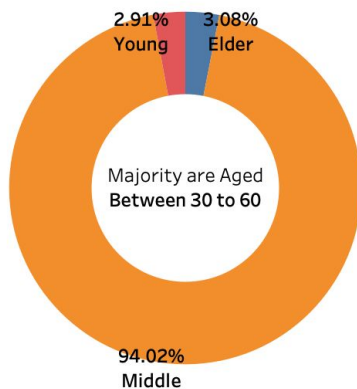


Sports Car?

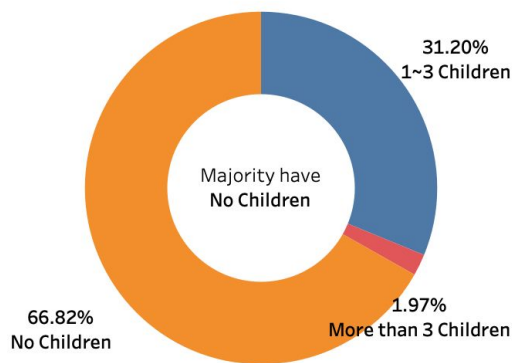


Groups After Manully Processed

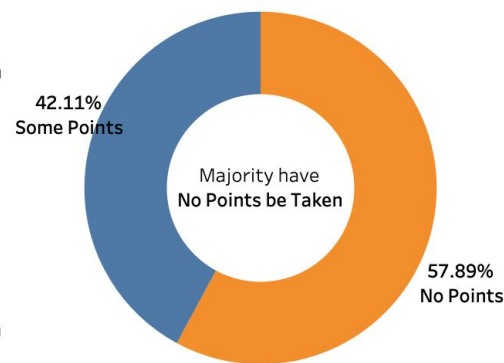
Age Group



Number of Children



Points been Taken



Scoring System

– “Score” clients from 0 to 6

Vehicle Use

Private

License Revoked?

No

Sports Car?

No

Age Group

Middle

Number of Children

No Children

Points been Taken

No Points



04

Takeaways

What to focus.

How to exam.

What to expect.

Scoring System

SCORE Customer out of 6 things 

Vehicle Use

License Revoked?

Sports Car?

Age Group

Number of Children

Points been Taken

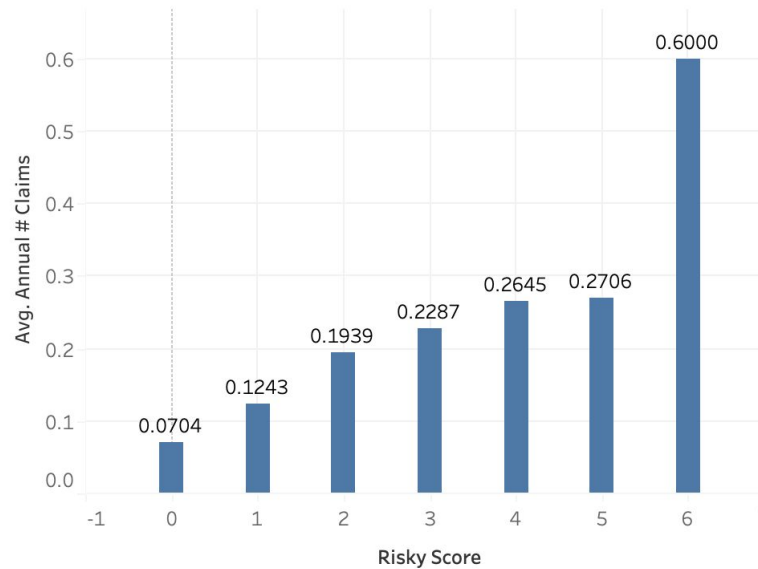
Total ? / 6 Score

Higher score, more likely to file a claim.

Lower score, less likely to file a claim.

Exam Our Scoring System

Five Year Average Number of Claims by Risky Group



The plot of average of Annual # Claims for Risky Score. The marks are labeled by average of Annual # Claims.

Five Year Average Claim Amount for by Risky Group





The plot of average of Annual Claim Amount for Risky Score. The marks are labeled by average of Annual Claim Amount.



Car Insurance with Data

Understand your [market](#) and [policyholders](#) better.

- Ensure adequate coverage.
 - Better Customer Care.
 - Fraud Prevention.
 - Efficient Processing.
- 
- 



Thank You!

Any Questions?