

Auto Insurance Claims

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Group 9

Overview

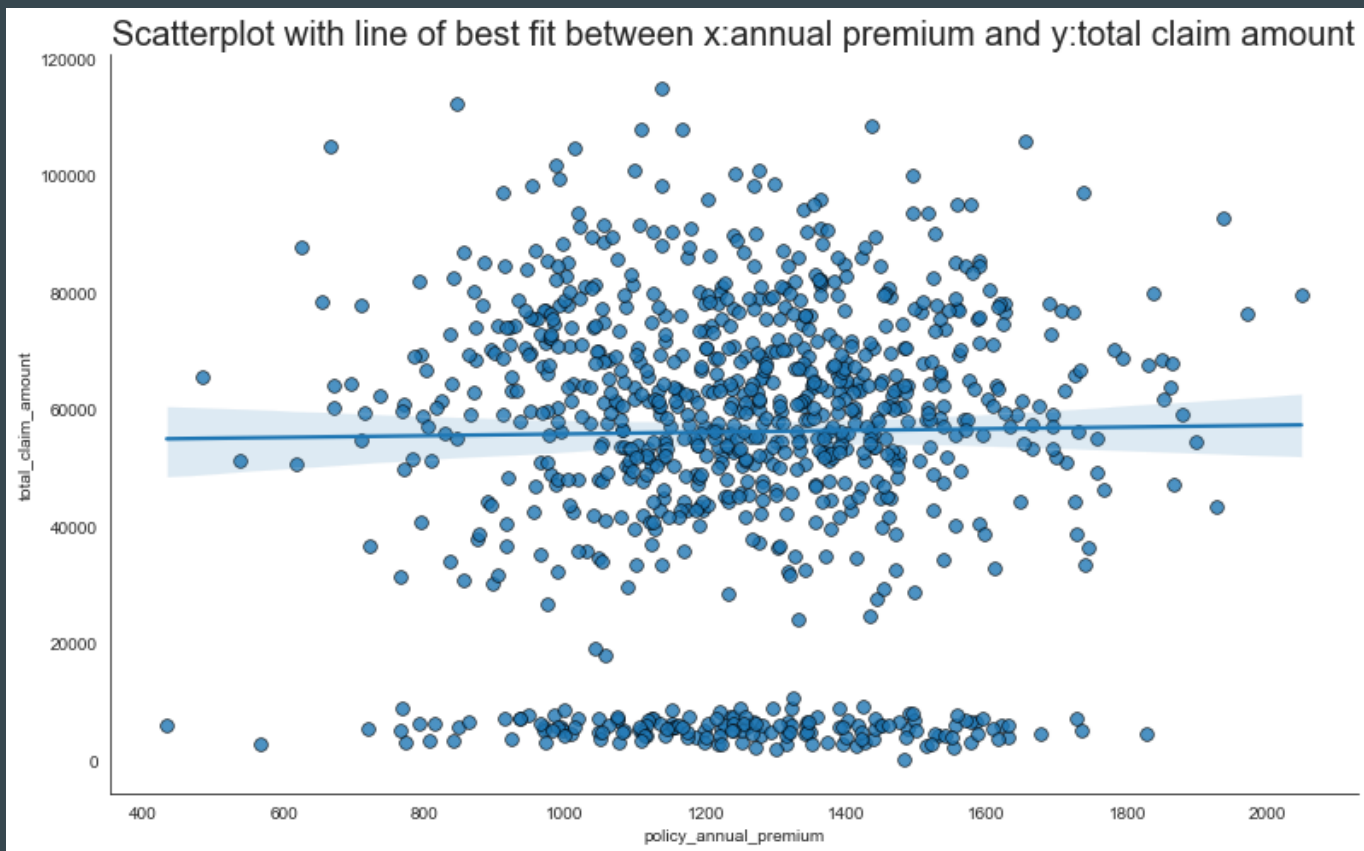
Intro to insurance claims

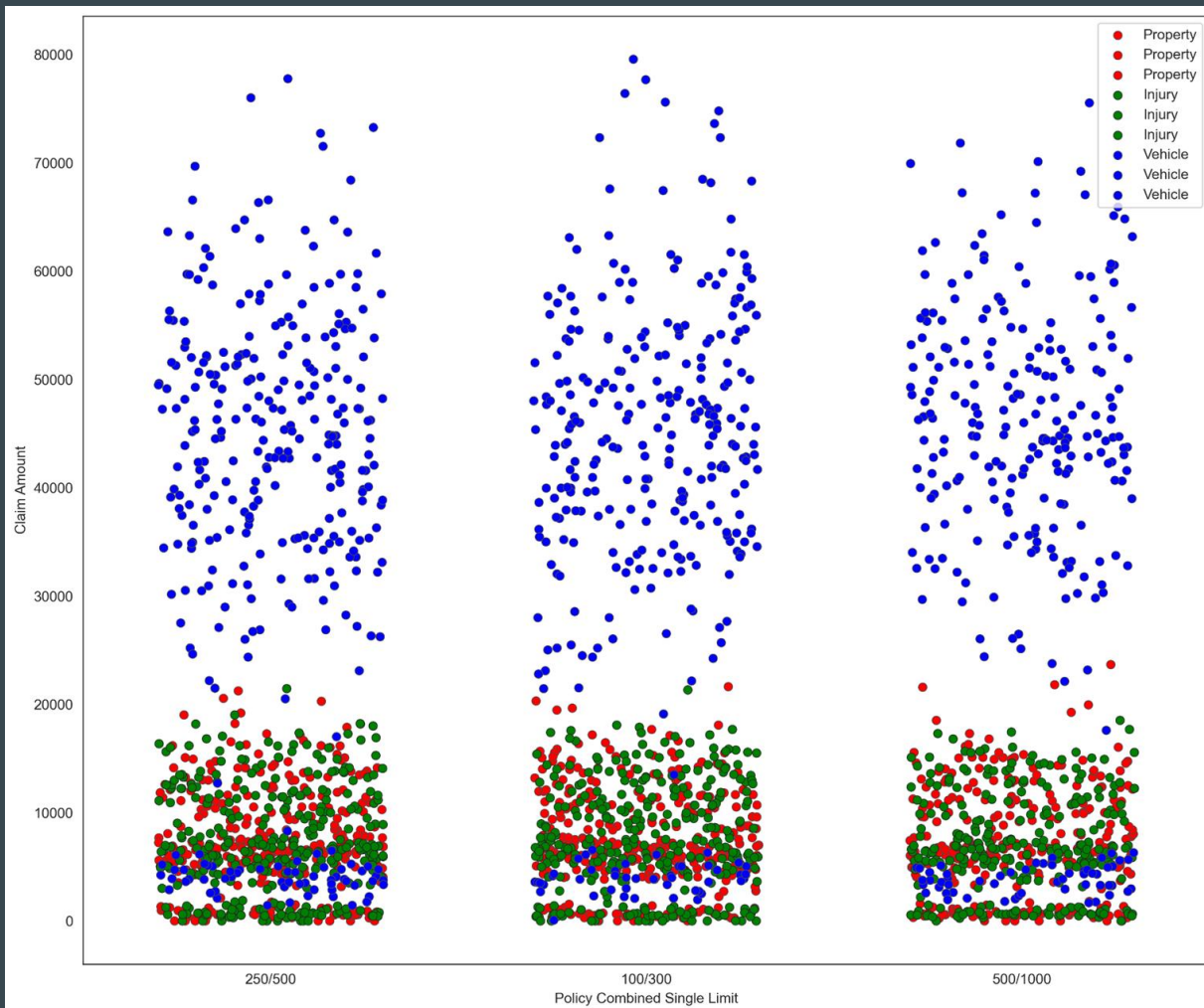
1. Life / non-life insurance, focus on automobile insurance
2. Insurance for vehicles is sought by vehicle owners so that, in the unfortunate case of an accident, they may reduce the expenses associated with property damage or theft of a car, liability for medical or property expenditures of others, and medical treatment for injuries.
3. In the event of an accident, the policyholder or customer will file a claim with the insurer to obtain coverage or reimbursement.

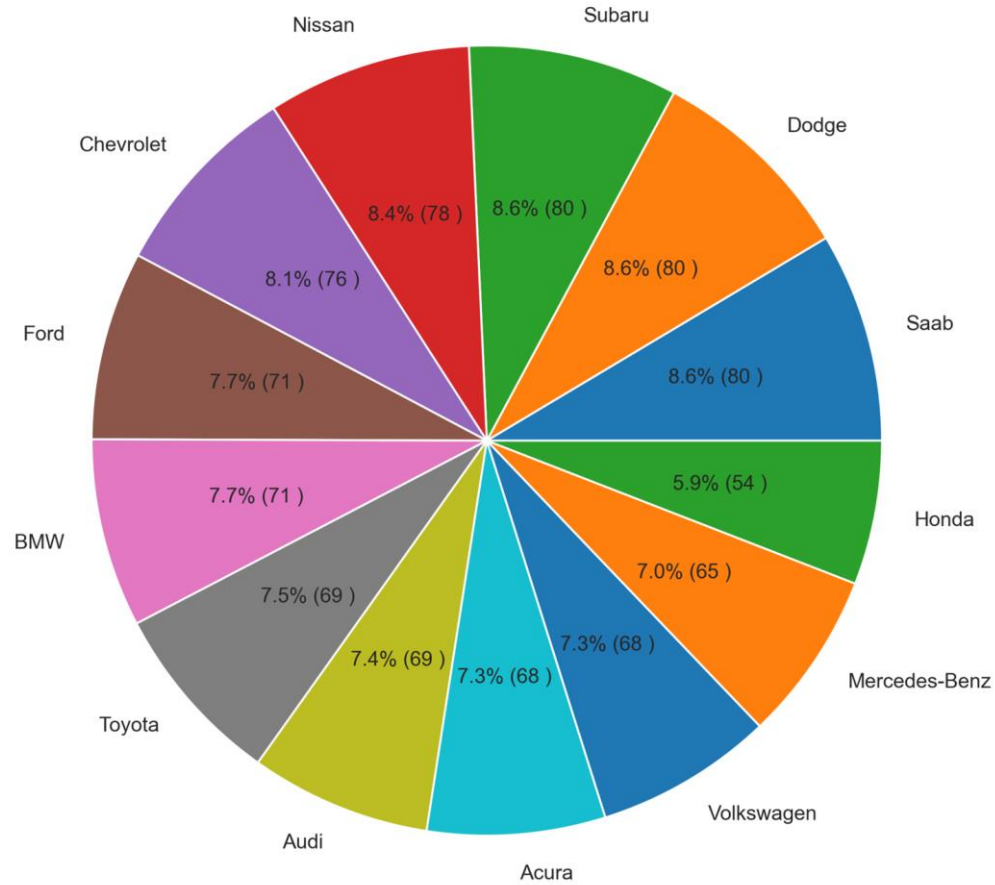
Understanding the problem

1. Insured party risk assessment method
2. Annual premium calculation

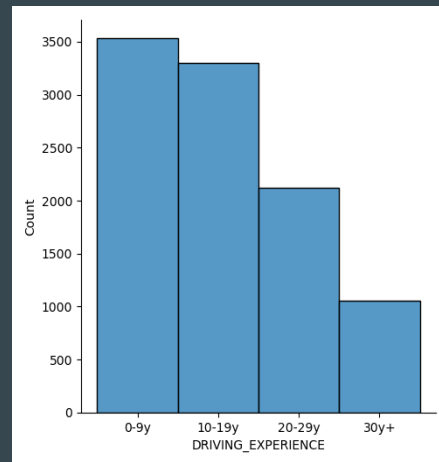
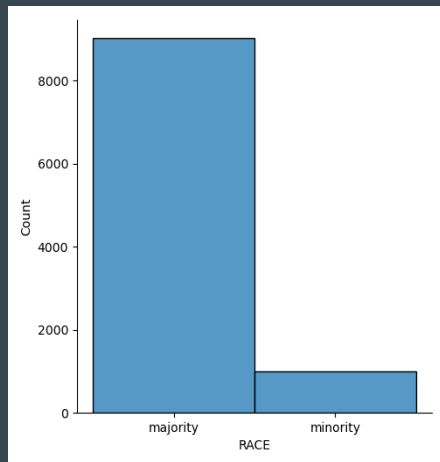
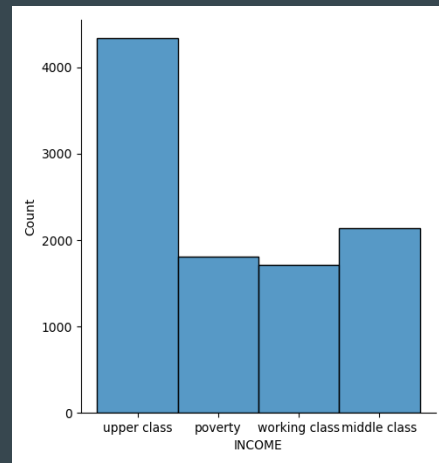
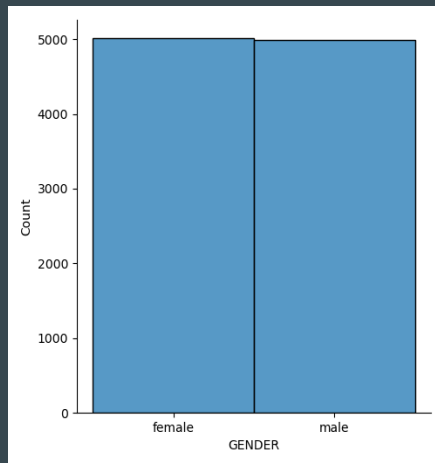
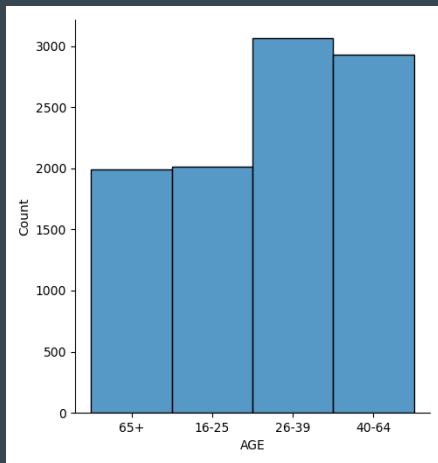
EDA RESULT 1

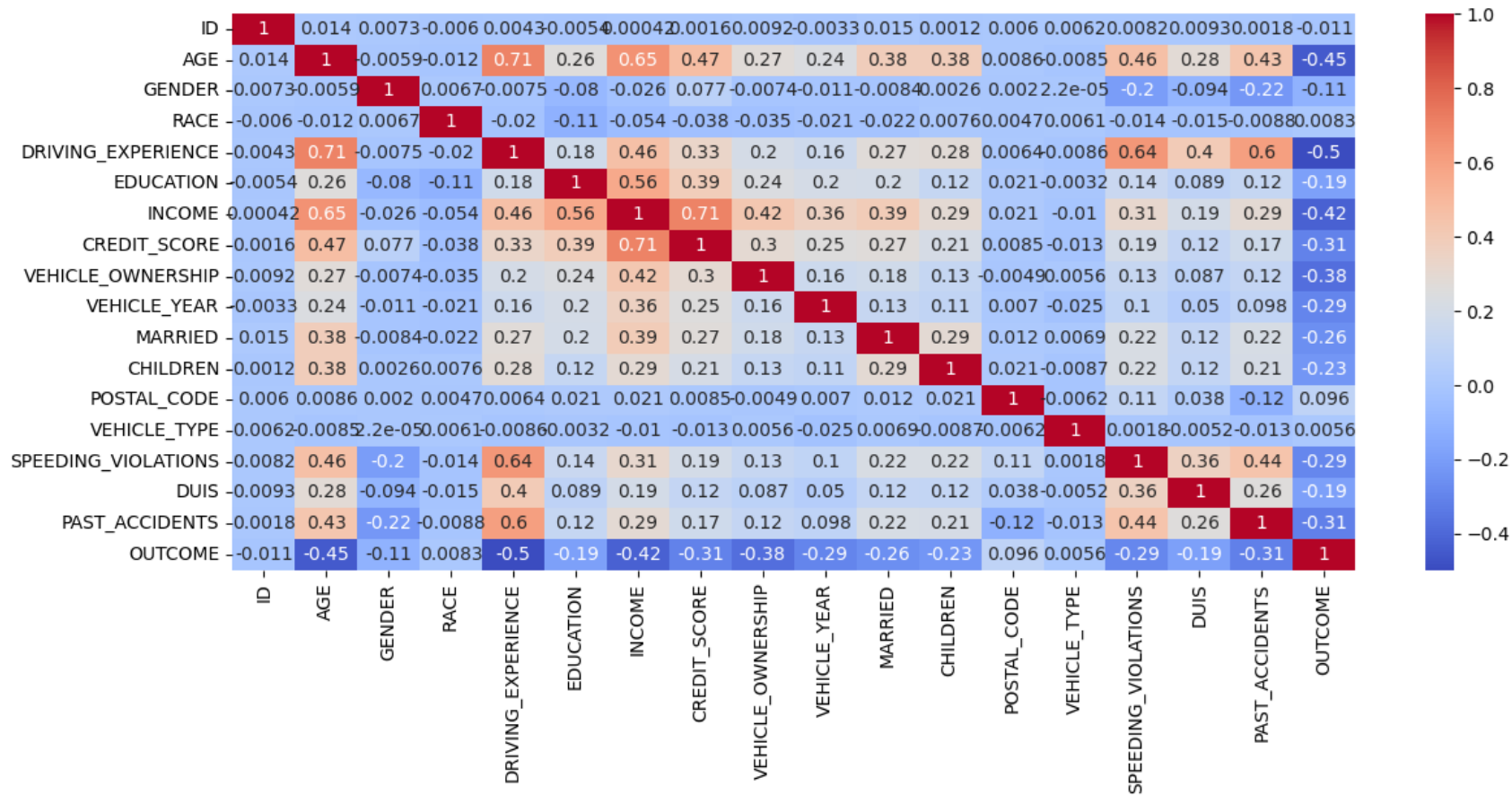






EDA RESULTS 2

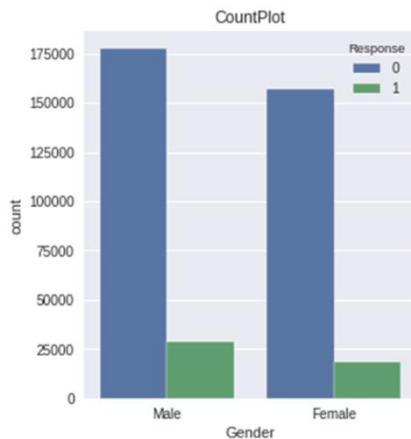
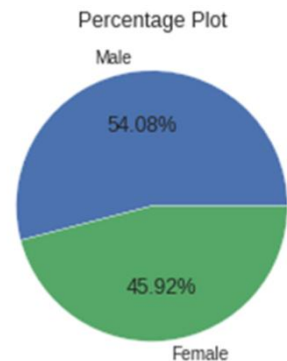
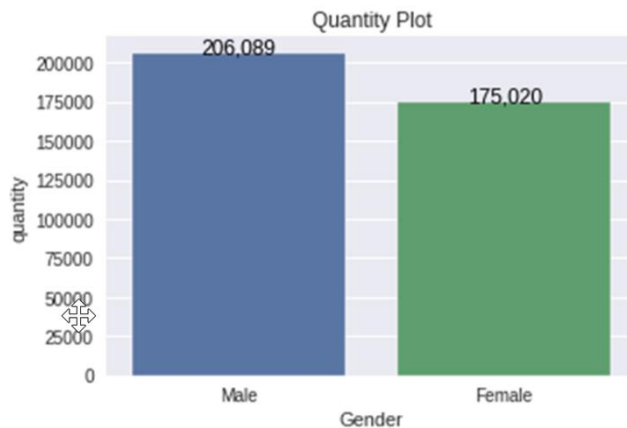




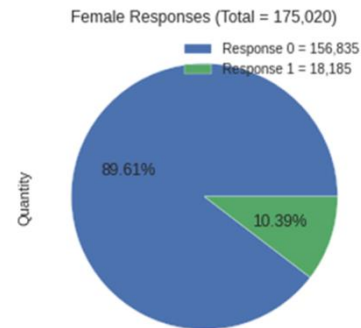
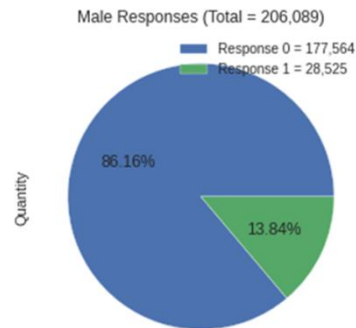
EDA RESULTS

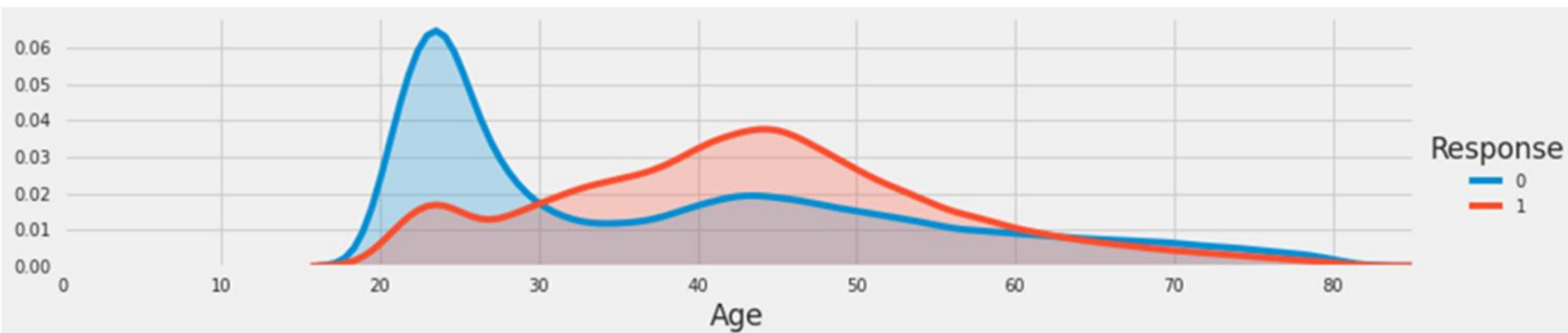
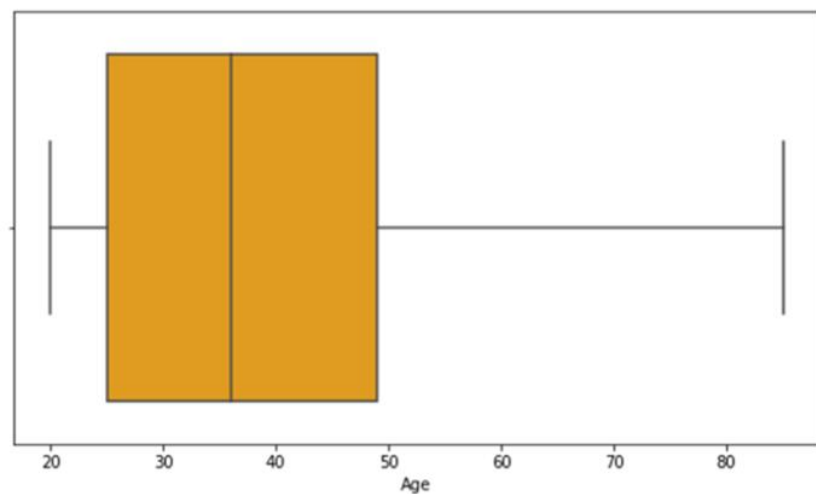
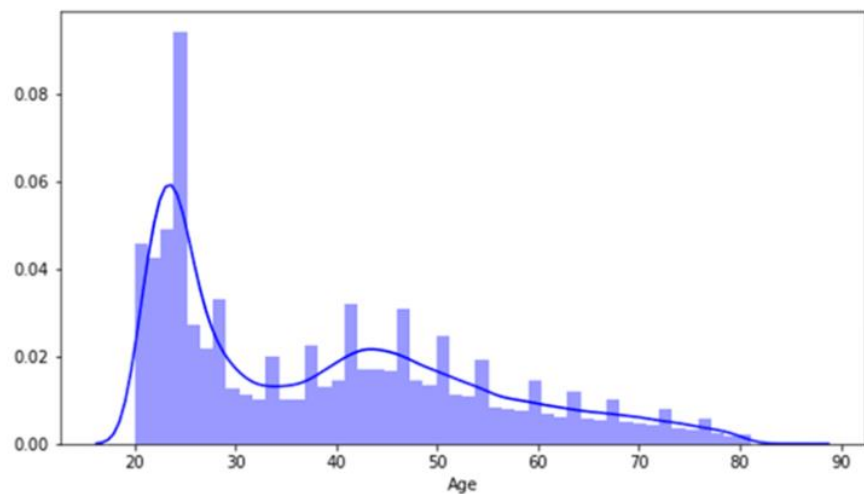
3

gender distribution

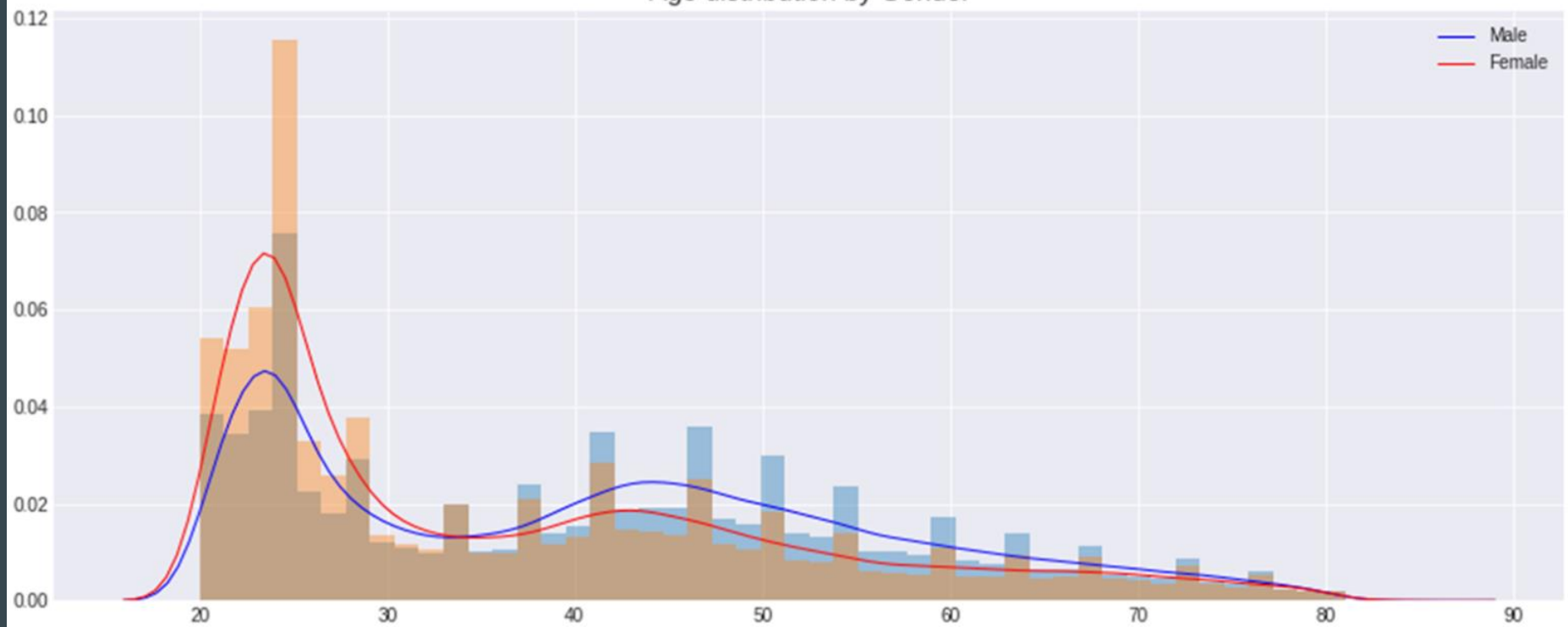


Distribution of Response by Gender





Age distribution by Gender



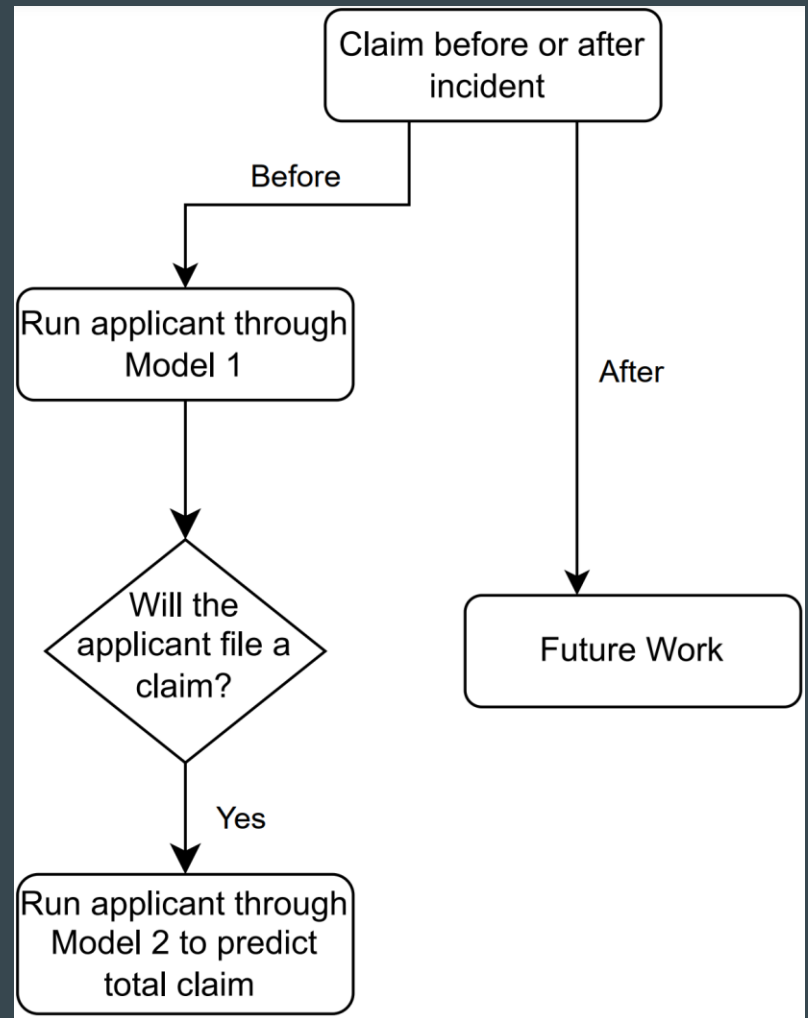
Focus & Objective

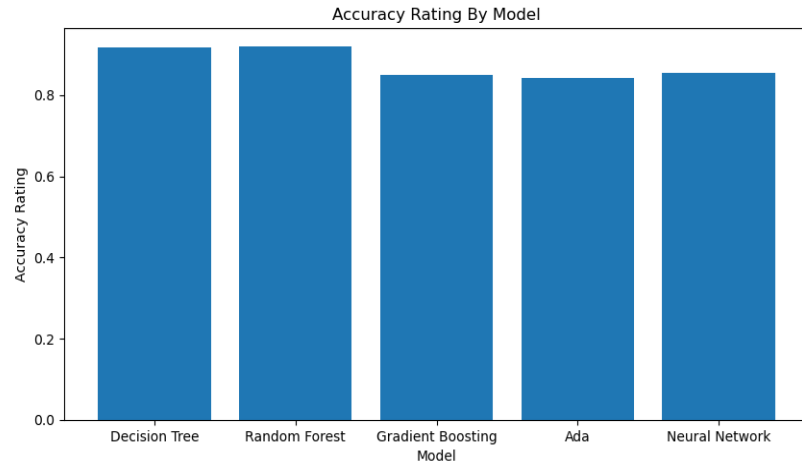
1. To find a much more significant determinant or factor in determining the premium of the insured party
2. To improve the risk assessment method of the insured party

Model Development

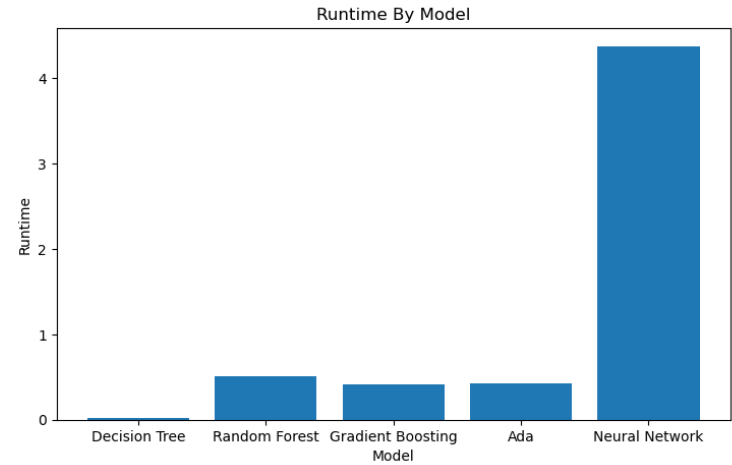
1. Preprocessing
2. “insurance claims” + “car features”
3. Repeated stepwise backwards removal
4. Compare 5 models

Model Flowchart





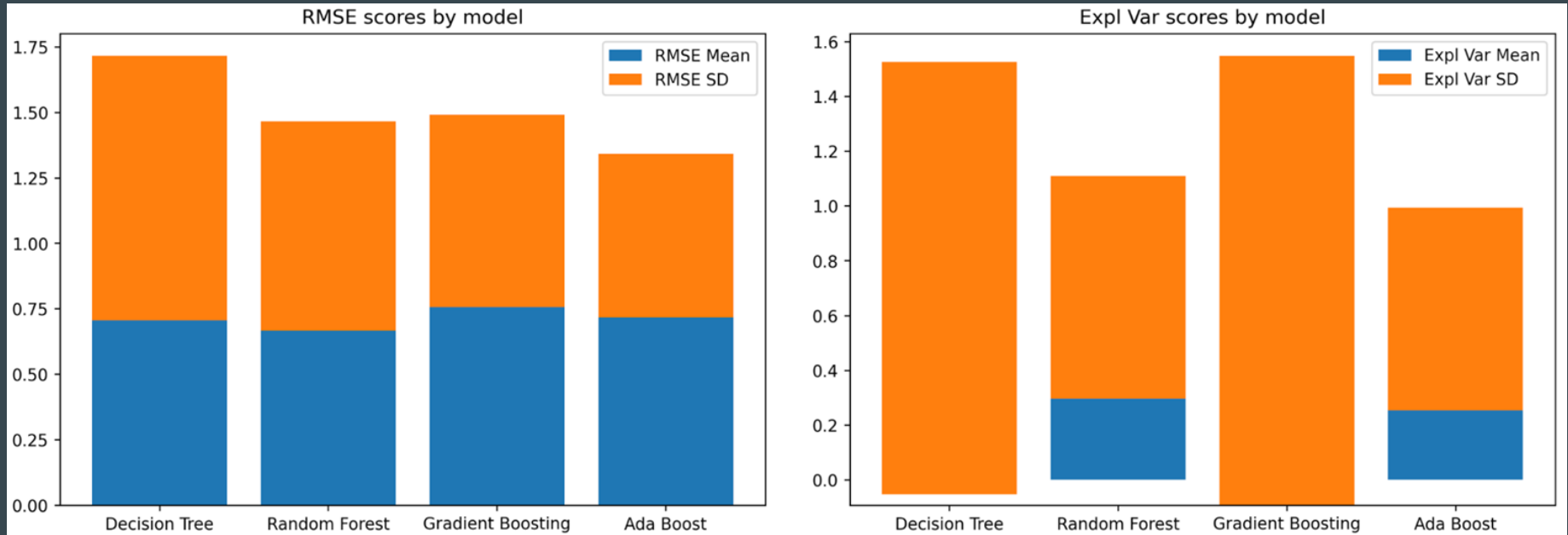
- Decision Tree:
0.9168571428571428
- Random Forest:
0.9192857142857143
- Gradient Boosting:
0.8507142857142858
- Ada: 0.843
- NN: 0.8542857142857143



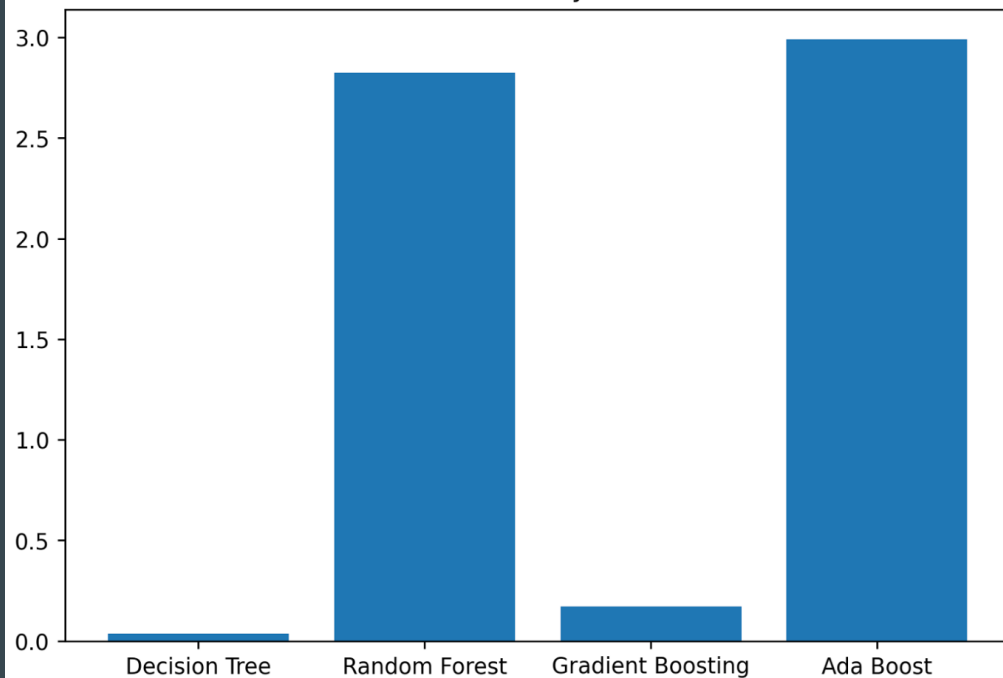
- Decision Tree:
0.01914525032043457
- Random Forest:
0.5165872573852539
- Gradient Boosting:
0.42074108123779297
- Ada: 0.4326636791229248
- NN: 4.370111465454102

2nd model Scores

Target “Total claim amount”



CV runtime by model



Top features selected

1. policy deductible
2. policy annual premium
3. insured hobbies
4. auto model
5. Vehicle Style

Research Significance

- Insurance companies can determine the claims for a specific period of time and for a specific customer portfolio.
- Insurance companies need to find a way to predict insurance payments and charge them appropriately to cover these risks.

Use Case

Model Outputs

1. Claim occurrence
2. Total claim amount

Examples

1. Annual premium calculation
2. Client onboarding
3. Cost projection

Conclusion

Maximizing the profit of insurance provider while charging a fair price to policyholders by improving risk assessment method and having better determinant for annual premium calculation

Future Work

- Our future model is the same as the total claim amount prediction, but for after incident purposes.
- It is full of more features and data that can be obtained from an incident, such as "incident severity."