AUTO INSURANCE FRAUD DETECTION

Rampam Greeshma Geethika
20BCD7094

INTRODUCTION

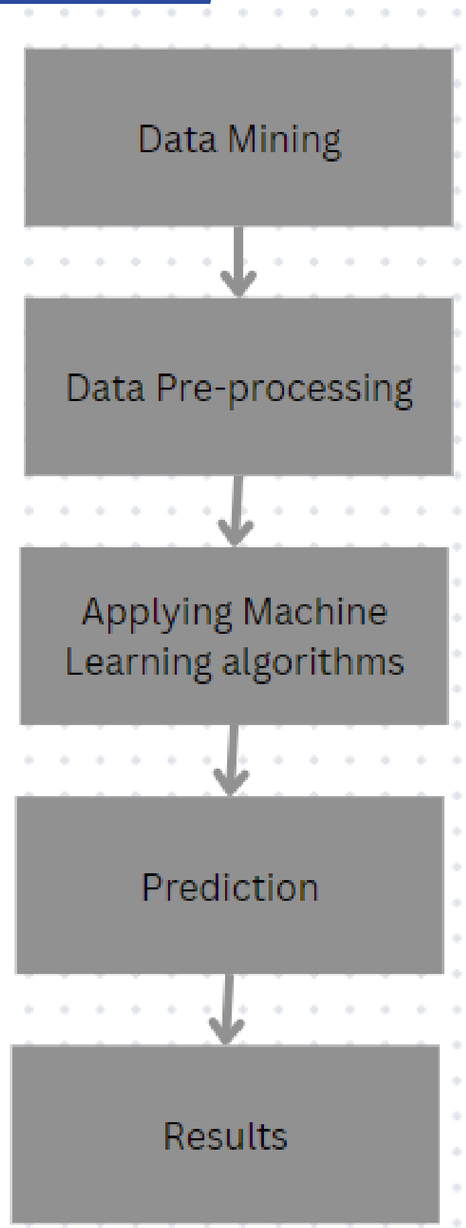
- AUTO INSURANCE FRAUD IS A SERIOUS ISSUE THAT COSTS INDUSTRIES MILLIONS OF DOLLARS ANNUALLY.
- DUE TO THE COMPLEXITY OF IDENTIFYING FRAUDULENT CLAIMS AND THE LARGE AMOUNTS OF DATA INVOLVED,
- DETECTING AND PREVENTING FRAUD IS DIFFICULT. INSURERS CAN NOW QUICKLY AND PRECISELY IDENTIFY FRAUDULENT CLAIMS THANKS TO MACHINE LEARNING,
- A PROMISING SOLUTION FOR AUTO INSURANCE FRAUD DETECTION.

RELATED WORKS

1. AUTOMOBILE INSURANCE FRAUD DETECTION USING SUPERVISED CLASSIFIERS — 80.4%

2. AUTO INSURANCE FRAUD DETECTION WITH MULTIMODAL LEARNING — 81.81%

3. AUTO INSURANCE CLAIM FRAUD ANALYTICS — 75%



METHODOLOGY

ALGORITHMS USED

Machine Learning Algorithms

- Decision Tree Classifier
- SVM Algorithm
- Random Forest Classifier
- KNN Algorithm

Boosting Algorithms

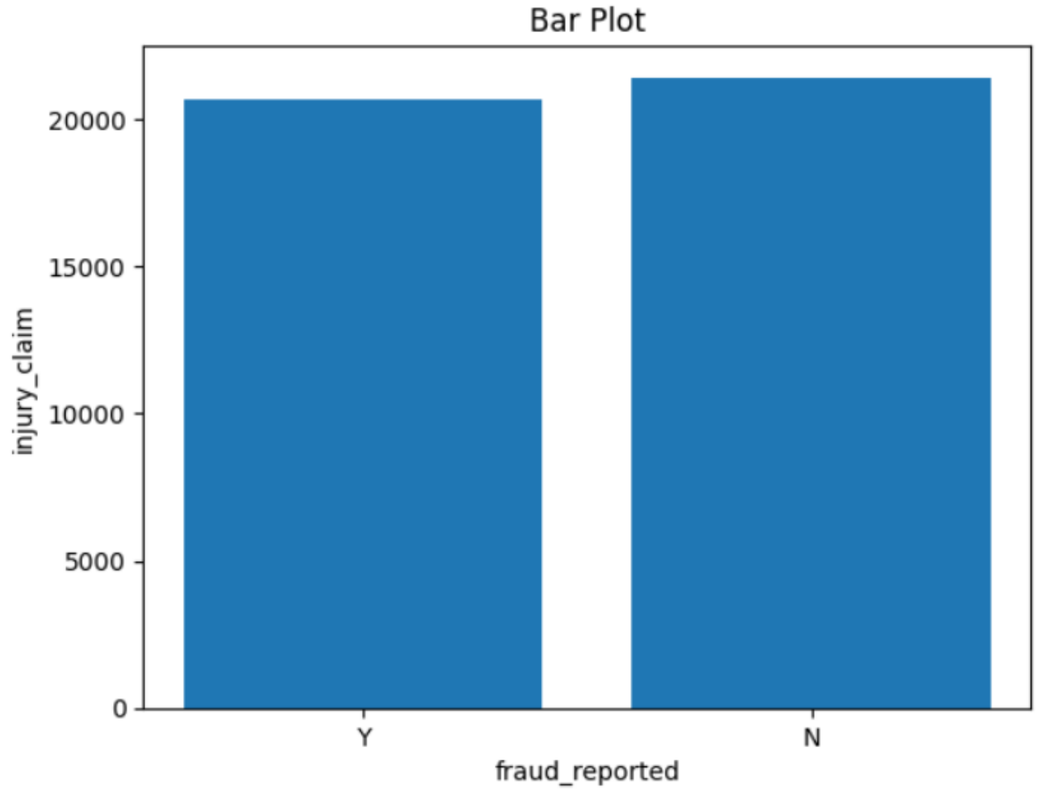
- Light GBM
- Gradient Boosting Algorithm
- CAT Boosting Algorithm
- ADA Boosting Algorithm
- XG Boost Algorithm

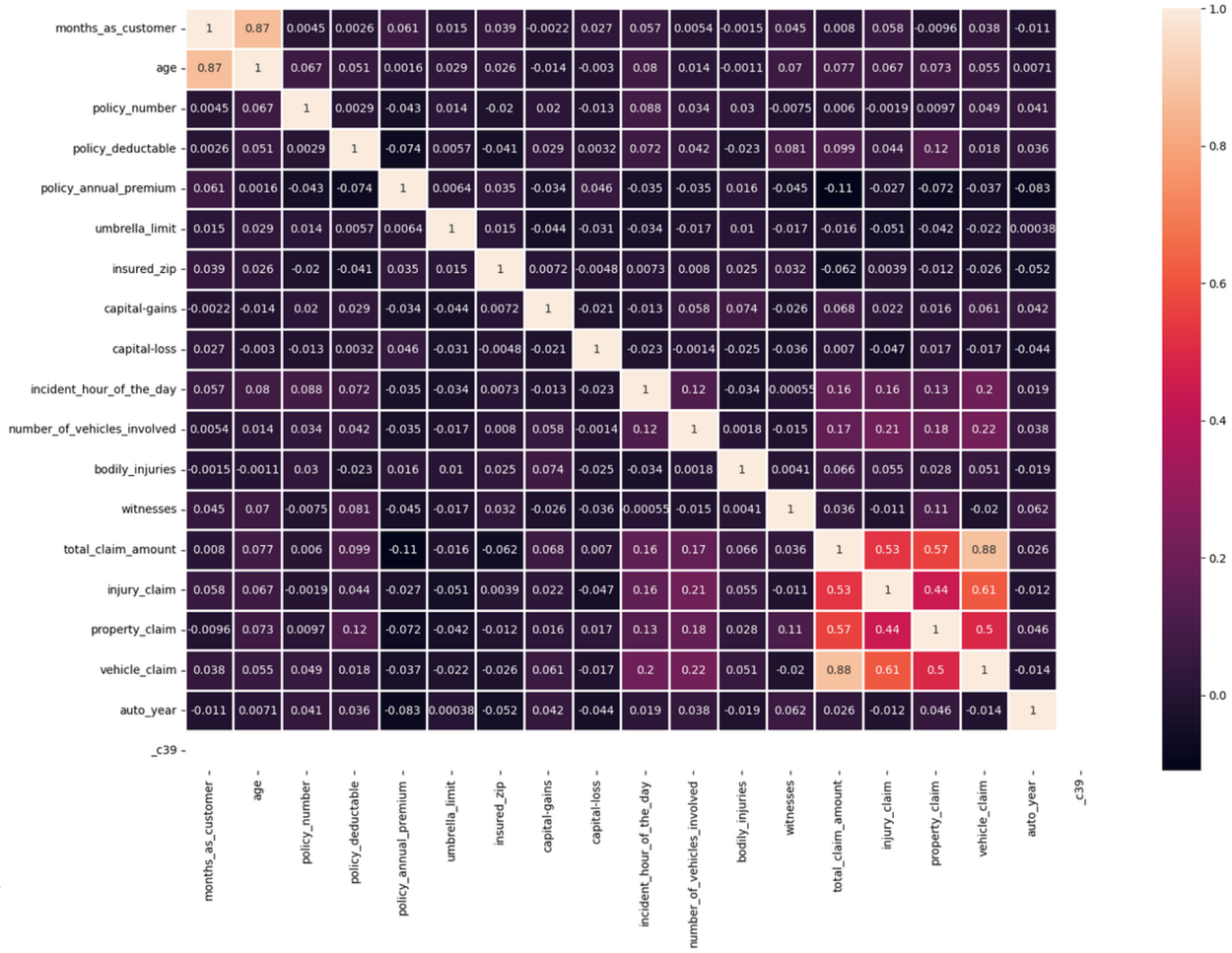
Data Collection

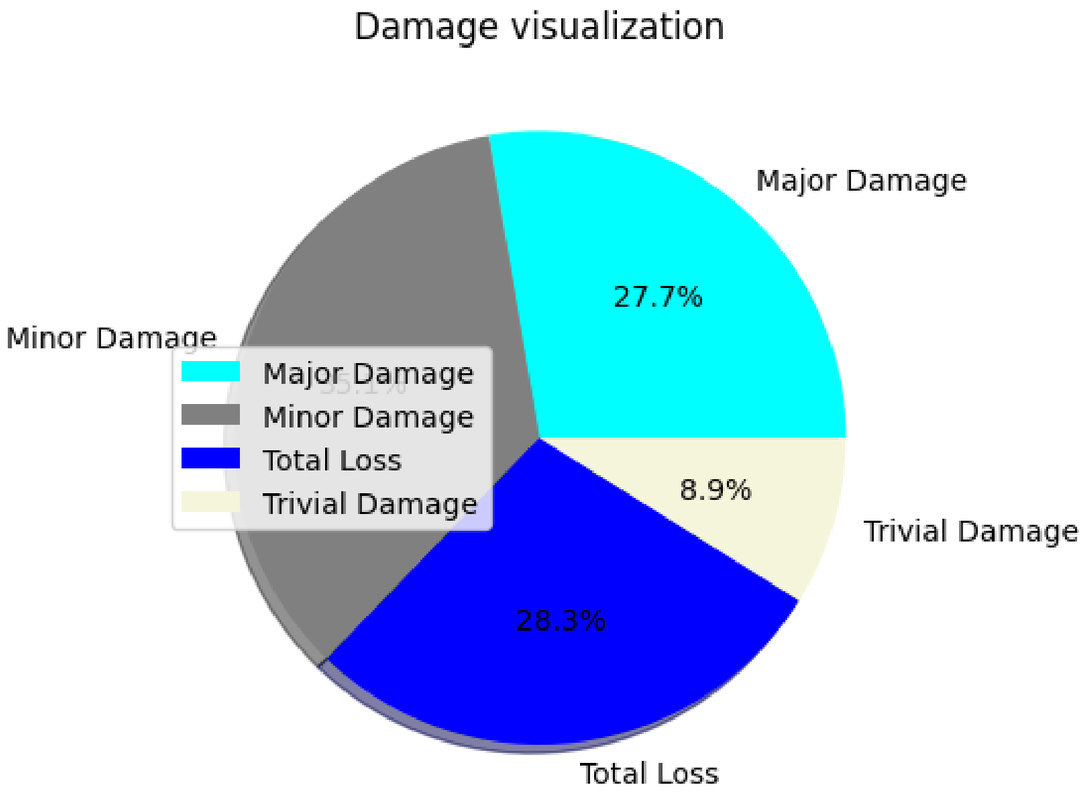
- Hybrid Datasets from Kaggle
- 1102 Instances
- Target Column: fraud_reported

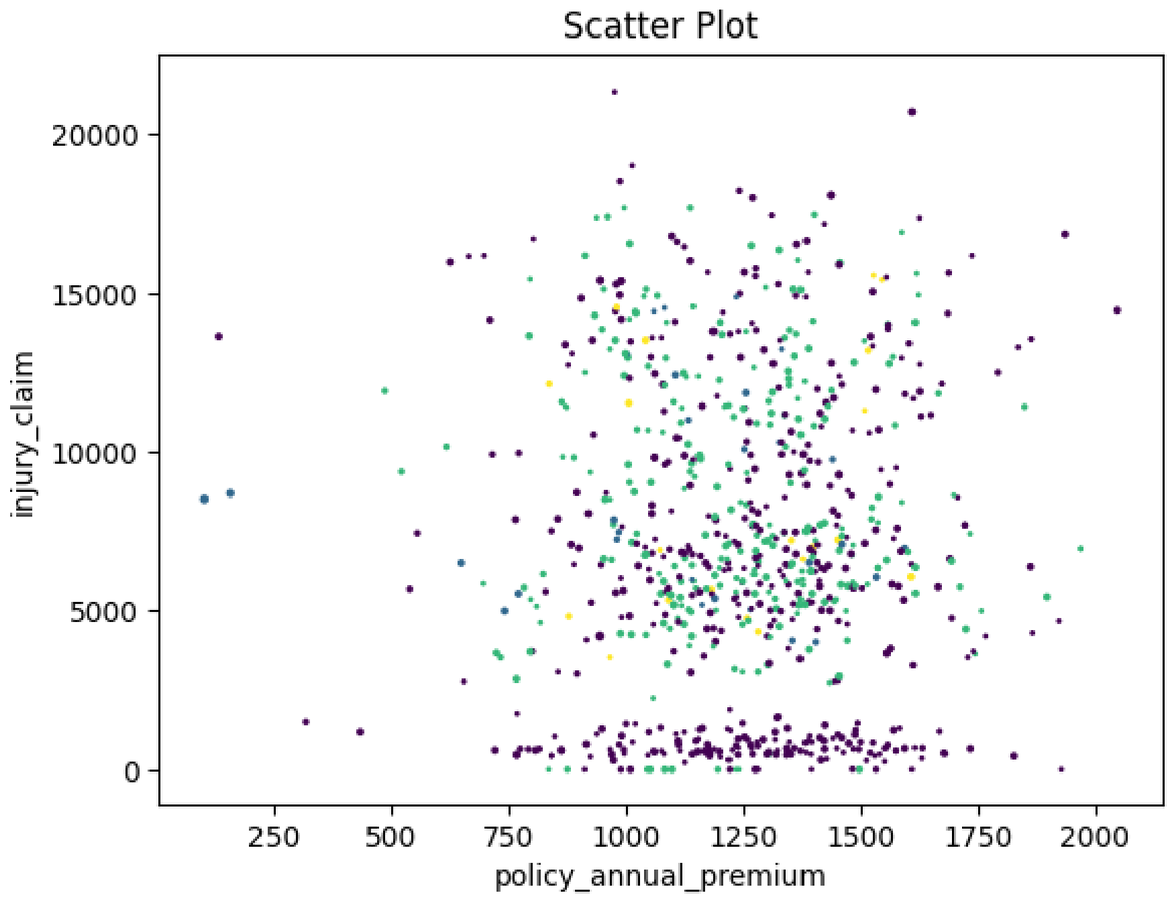
police_report_available	total_claim_amount	injury_claim	property_claim	vehicle_claim	auto_make	auto_model	auto_year	fraud_reported
YES	71610	6510	13020	52080	Saab	92x	2004	Y
YES	20000	8512	5263	55000	Saab	82x	2005	Y
YES	51590	9380	9380	85274	Audi	A5	2015	N
YES	27700	2770	2770	22160	Toyota	Camry	2012	N
NO	42300	6452	4700	54875	Saab	92x	1996	N

Data Visualization






Damage visualization
Major Damage
27.7%
Minor Damage
Major Damage
Minor Damage
Total Loss
Trivial Damage
8.9%
Trivial Damage
28.3%
Total Loss

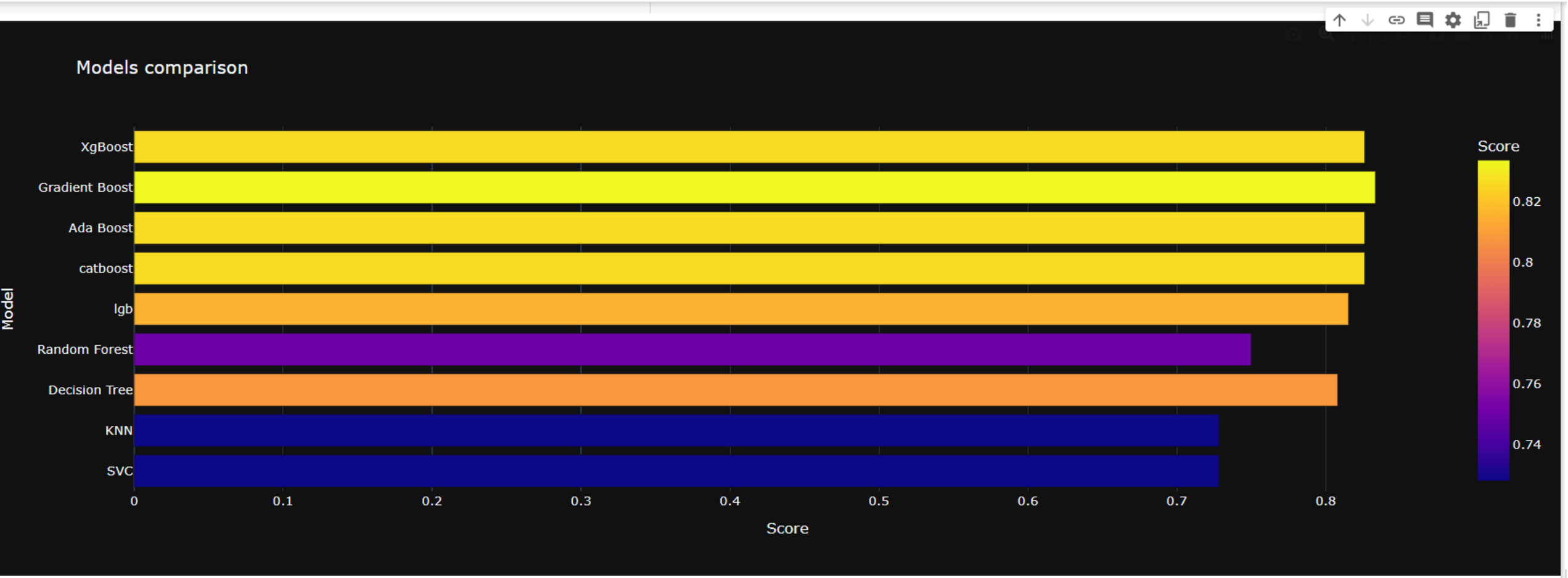

Scatter Plot
20000
15000
10000
5000
0
injury_claim
250
500
750
1000
1250
1500
1750
2000
policy_annual_premium

Results

- By using Gradient Boosting Algorithm, we obtain a accuracy of 83.33%

	Model	Score
7	Gradient Boost	0.833333
5	catboost	0.826087
6	Ada Boost	0.826087
8	XgBoost	0.826087
4	lgb	0.815217
2	Decision Tree	0.807971
3	Random Forest	0.750000
0	SVC	0.728261
1	KNN	0.728261

Model Comparison



Thank You