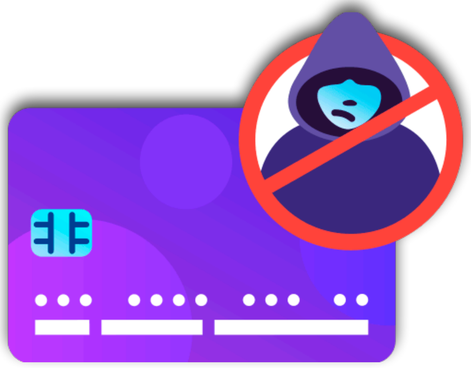

Credit Card Fraud

Talking about credit card fraud detection is crucial because it shows how technology and financial security meet, demonstrating how creative solutions shield people and organizations from ever-changing cyber threats to protecting financial transactions.

Sarah Azzalddin

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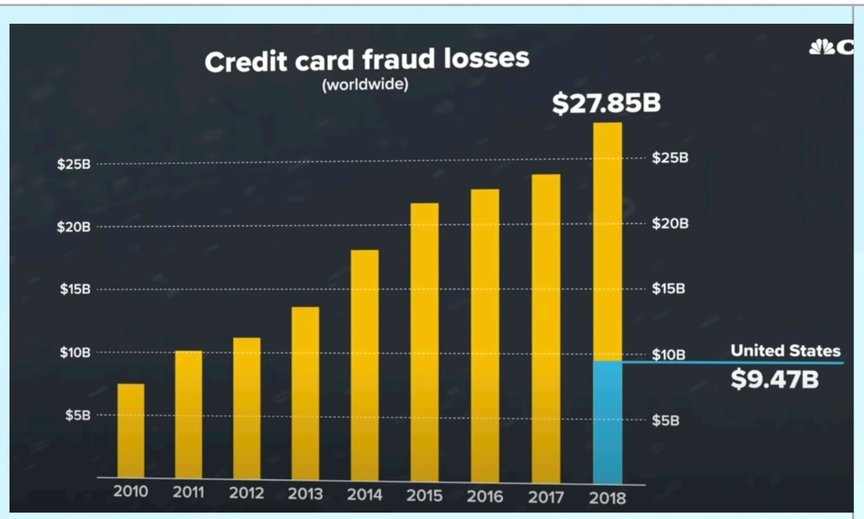
Minds that move the world



01. Problem

The U.S. is responsible for more than a third out of the 28 billion dollar losses globally as a result of credit card fraud.

The concern over fraud with credit cards has been significantly rising with the excessive use of online purchasing causing serious financial losses as well as damage to a person's credit rating. Therefore, it is crucial to identify and detect those fraudulent transactions and come up with data and statistics that help limit them.

02. Background

- Fraud tactics are evolving which makes the traditional fraud detection methods weakly effective.
- Inaccurate data analysis due to false positives and false negatives.
- As financial transactions are using innovative techniques, securing those transactions is a need. Thus, old rule-based systems will not be able to keep up with the emerging fraud patterns.

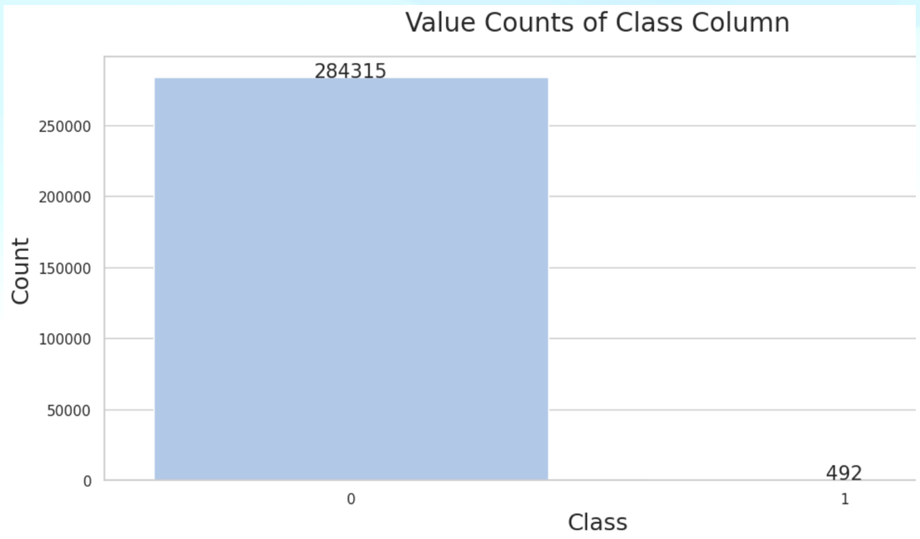
Machine Learning is the answer!

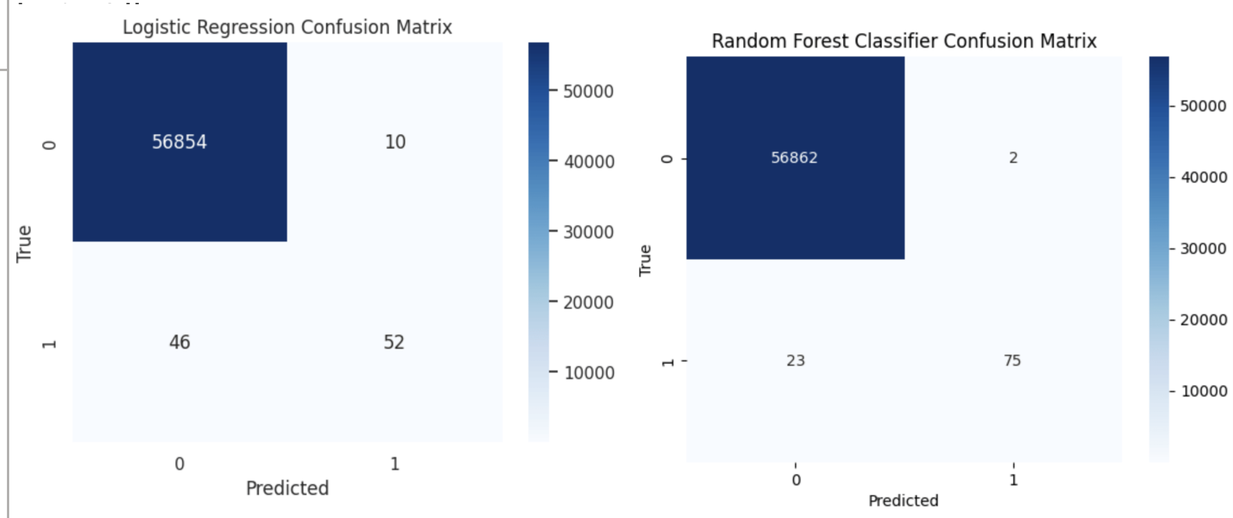
03. Approach

Data collection: Utilized a Kaggle dataset that contains time-elapsed transactions, the amount in dollars per transaction, 28 features, and class.

Preprocessing: Model selection: supervised learning for labeled data 0 for legit translation and 1 for fraudulent transaction.

Model Selection: employed confusion matrix to check the model performance of logistic regression and random forests and learn patterns from the data.





Selecting 1000 samples of Class 0 using random sampling

04. Evaluation

Using key metrics such as F1 score, precision, accuracy, and recall, I was able to estimate and examine the machine learning methods' performance. I utilized confusion matrices to conduct a comprehensive analysis of the models' effectiveness in detecting fraudulent transactions.

Logistic Regression	Random Forest
Accuracy: 0.978	Accuracy: 0.982
Precision: 0.994	Precision: 0.987
Recall: 0.963	Recall: 0.975
F1-Score: 0.978	F1-Score: 0.981

05. Conclusion

Key Findings: The method shows promising results in identifying fraudulent credit card transactions. Lowering false positives is effective now!

While Logistic Regression is a simpler model and may perform better on unbalanced datasets, Random Forest Classifier may have superior accuracy because of its capacity to capture complicated associations.

06. References

- Cornell Law School. "Credit Card Fraud." LII / Legal Information Institute, 2019, www.law.cornell.edu/wex/credit_card_fraud. Accessed 29 Nov. 2023."Creditcard Fraud - Logistic Regression Example." Kaggle.com, www.kaggle.com/code/marcelotc/creditcard-fraud-logistic-regression-example.
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