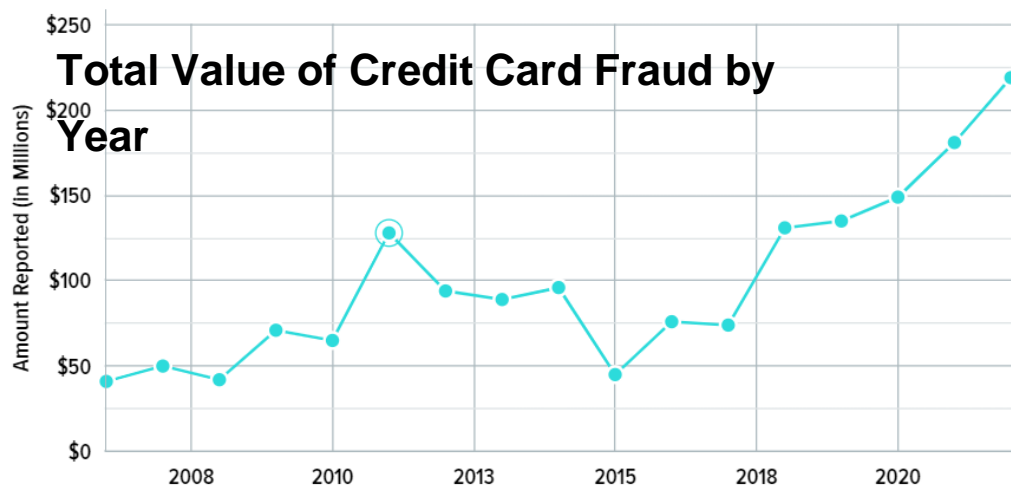# Credit Card Fraud

- **Tyler, Ryan, Elizah, Puchuan**

Problem statement and analysis

- Rise in credit card fraud
  - Result of growth of online transactions
  - Data breaches
- Financial loss
- Solution
  - Developing a robust fraud detection system

Total Value of Credit Card Fraud by Year

Amount Reported (In Millions)

(Source: Consumer Sentinel Network, Annual Reports)

Example cases

One of the largest **Credit Card Fraud Scam** was being made back in 2013.

about $200 million credit card fraud case.

Over 7,000 false identities and tens of thousands of credit cards.

several jewelry stores in Jersey City, N.J., in processing fake transactions.

Techniques and Sophistication:

- **Used fake identification to spend money on credit cards.**

Possible solutions to avoid this problem:

- **Detect the amount of money being spent on the bank account.**
- **Detect the occurrence of same/similar transactions**

Demo

1. **Dataset Preparation**
   ○ Load credit card transaction data.
   ○ Train a RandomForestClassifier on the training set.
2. **Model Evaluation**
   ○ Predict and evaluate on the test set using accuracy and classification report metrics.
3. **Pattern Recognition**
   ○ Identify unusually high transactions compared to user's average spending.
4. **Anomaly Detection**
   ○ Detect transactions exceeding a set threshold (e.g., $3000) as potential anomalies.

Development Process

- Requirements
- Data/test collection
  - Added pattern recognition later
- Choosing ML-library
  - Scikit-learn
- Select algorithms and models
  - RandomForestClassifier
- Train models
- Test and tweak algorithms and models

Lesson learned

- Financial security systems
  - How fraudulent credit card activity is found/tracked
- Approach to developing AI/ML models
- Dataset driven software development
- Evaluation/testing challenges

Souces

https://www.neuraldesigner.com/learning/examples/credit-card-fraud/

https://www.verifi.com/news-and-press-releases/special-report-feds-bust-200-million-credit-card-fraud-ring-2/

https://wallethub.com/edu/cc/credit-card-fraud-statistics/25725#:~:text=Fraud%E2%84%A0%20Study

https://www.fool.com/the-ascent/research/identity-theft-credit-card-fraud-statistics/