2022.07.01

Data Analysis Exercise

Chen Yi- Ju (Ernie)

paidy

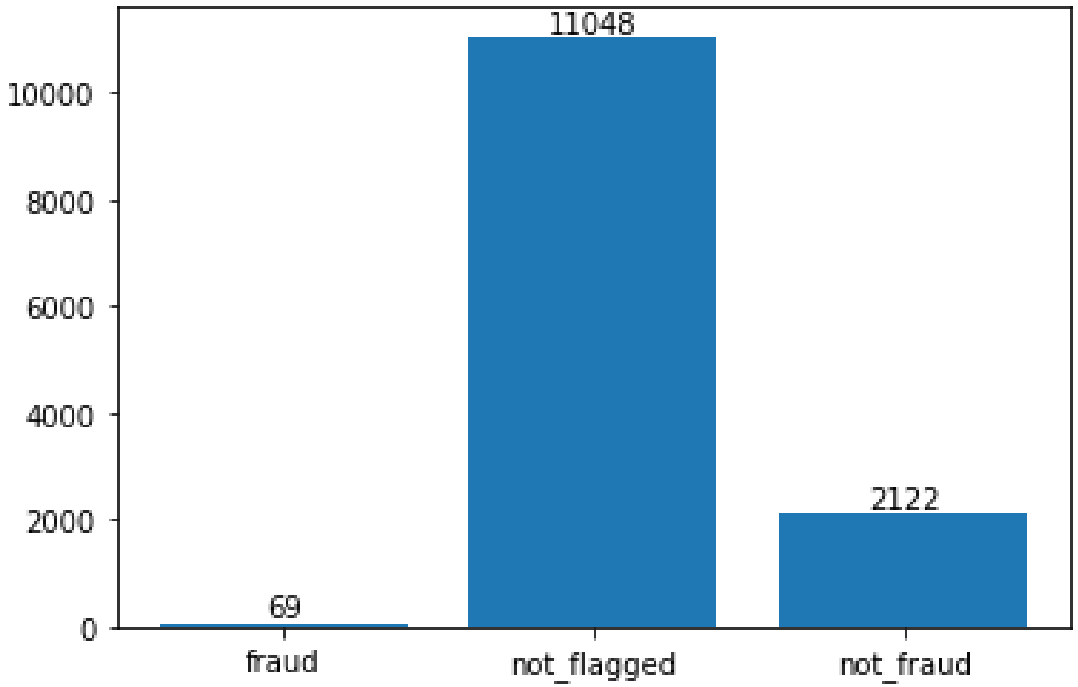
Table of contents

paidy

Overview

The data

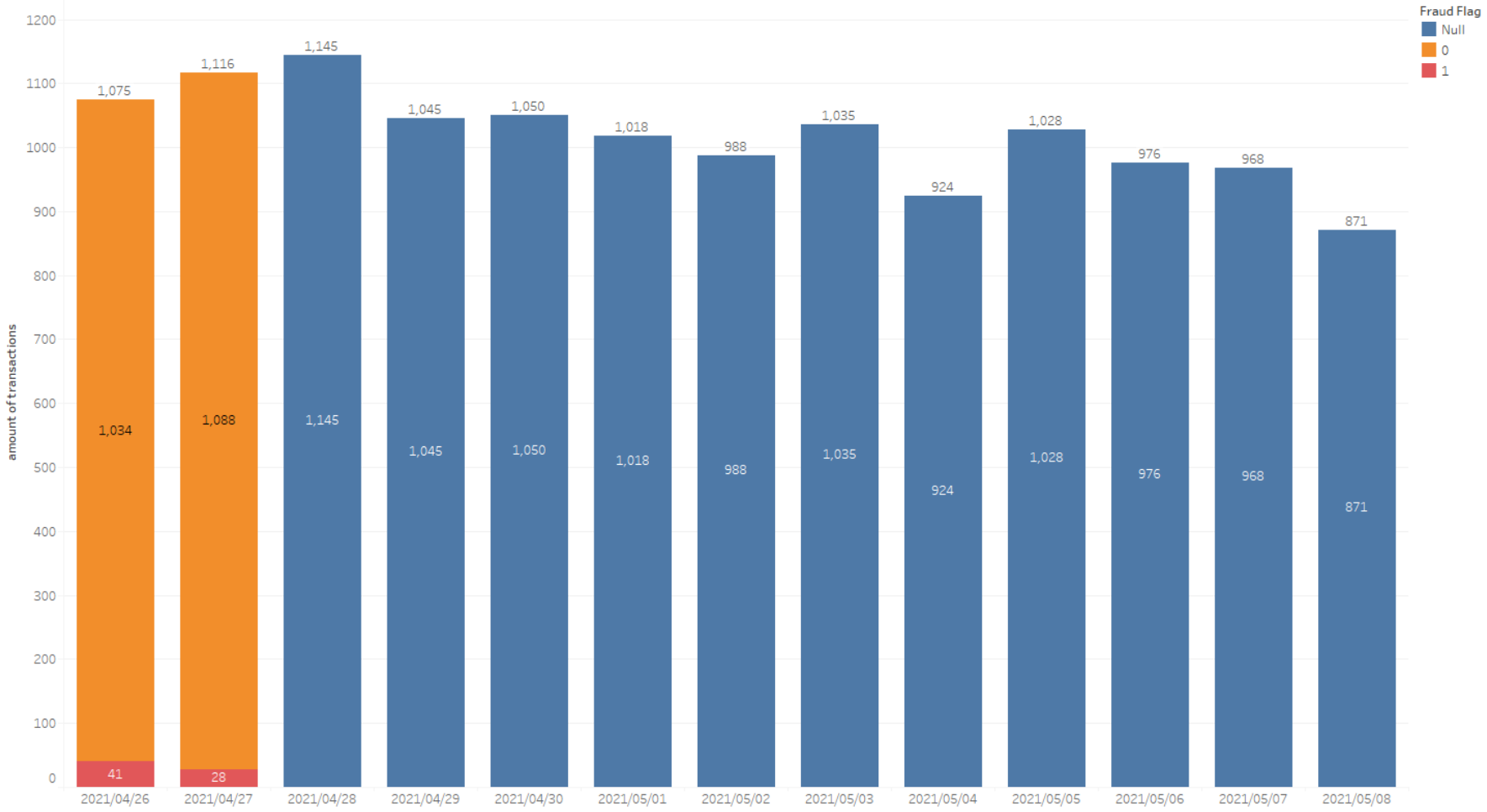
With a total of 13239 data points, there were 2191 flagged data points ~4/27, with the rest unflagged



paidy

Overview

The data



paidy

Overview

The Goal: answering the questions

Discovering "why this happened” and “how to prevent it”

paidy

Overview

The Goal: answering the questions

- What is the suspicious pattern?
- Flag the payments that look suspicious from 4/28
- Propose some rules to block the suspicious payments
- What additional data points could help?

paidy

Pattern Discovery

Key Findings from data flagged as fraud

- All fraud happened in the blues store
- All fraud had payment time happening just before or right after account creation(in less than 2 minutes) -> 0 ltv
- There are three kinds of email domain used, of which includes “gomen-da.com”, a disposable temporary domain
- All the transactions happened in new stores (0 days of age)
- A relatively low percentage (less than 1/3) of the users had same phone numbers for Paidy and marketplace

paidy

Proposed Rule

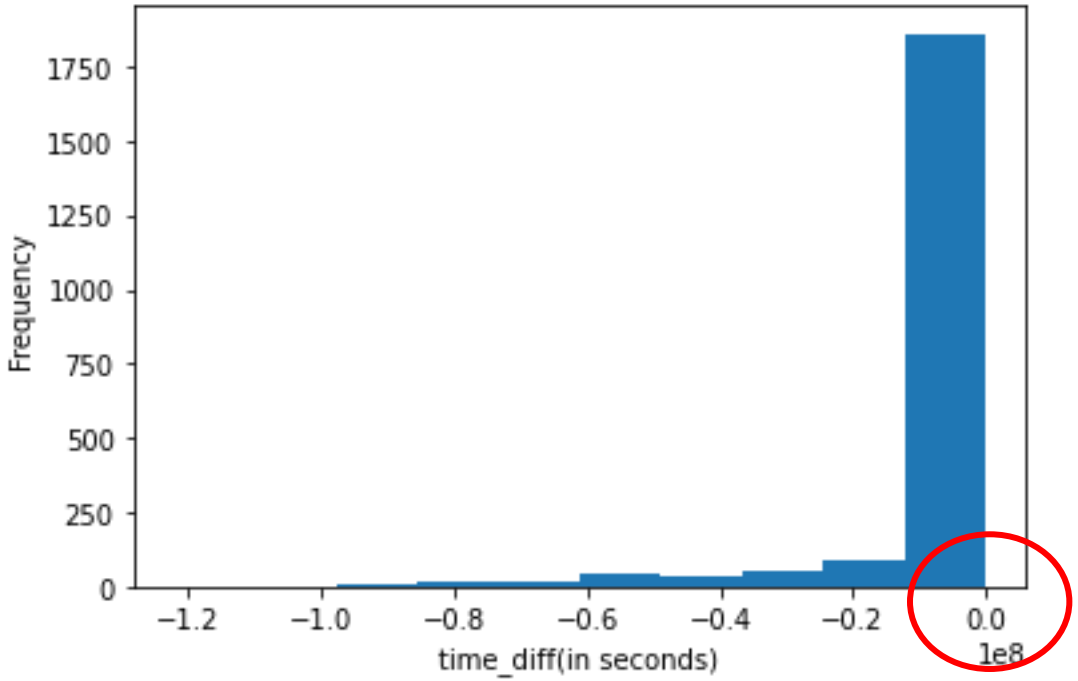
"if the user account is created within 3 minutes after the payment/transaction, identify it as fraud"

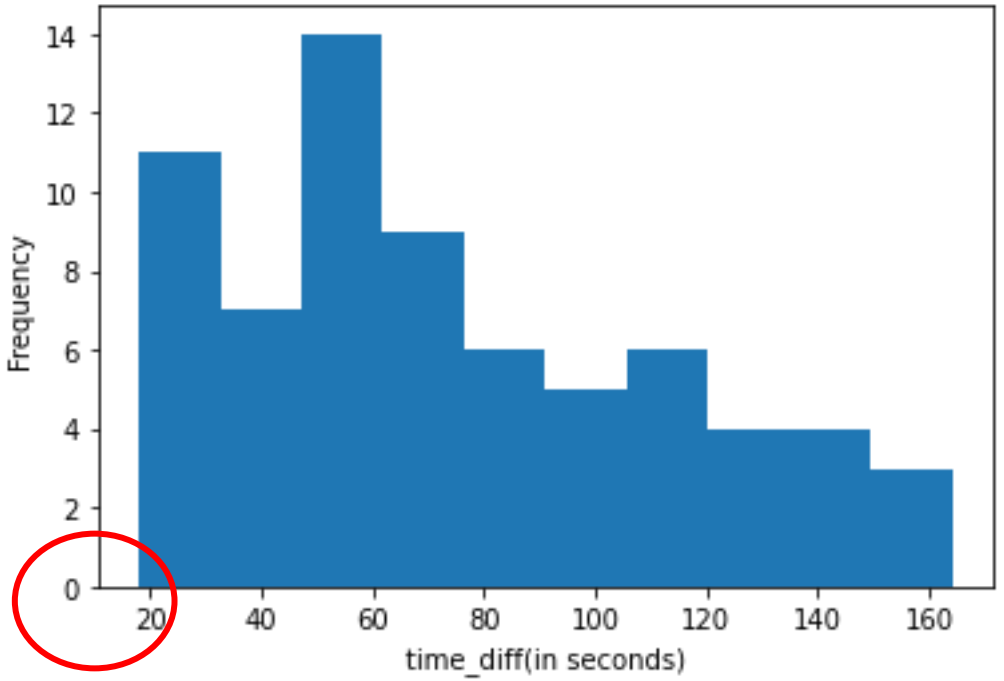
paidy

Proposed Rule

Reasoning

A clear distribution difference between fraud and non-fraud data



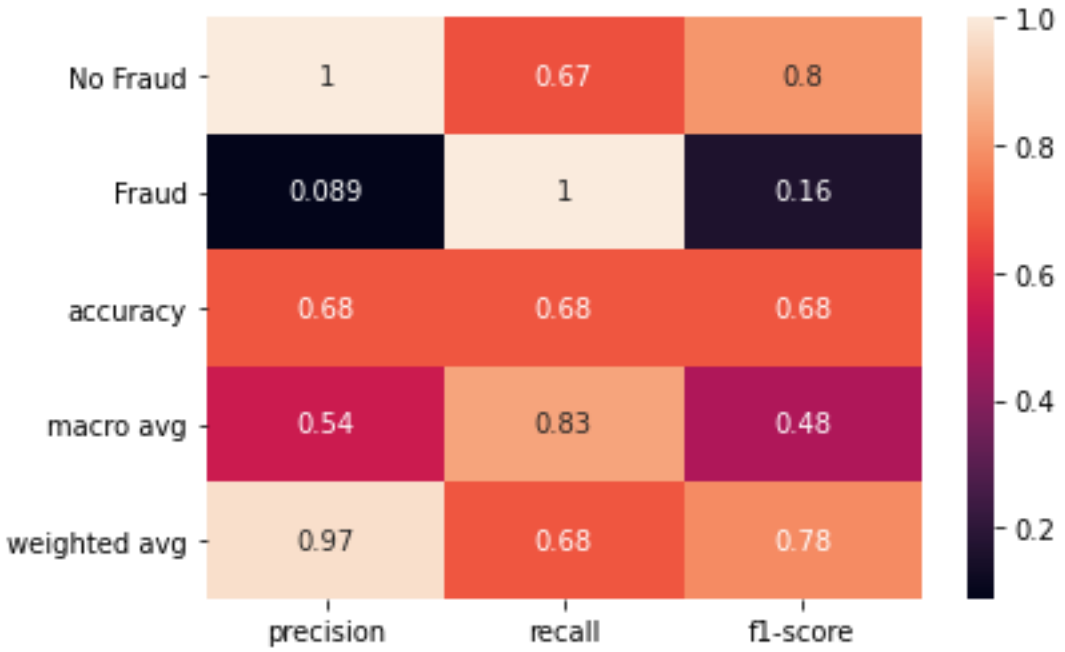


paidy

Metrics and results

Using the original data to evaluate

Below is the classification results using the original labeled data.

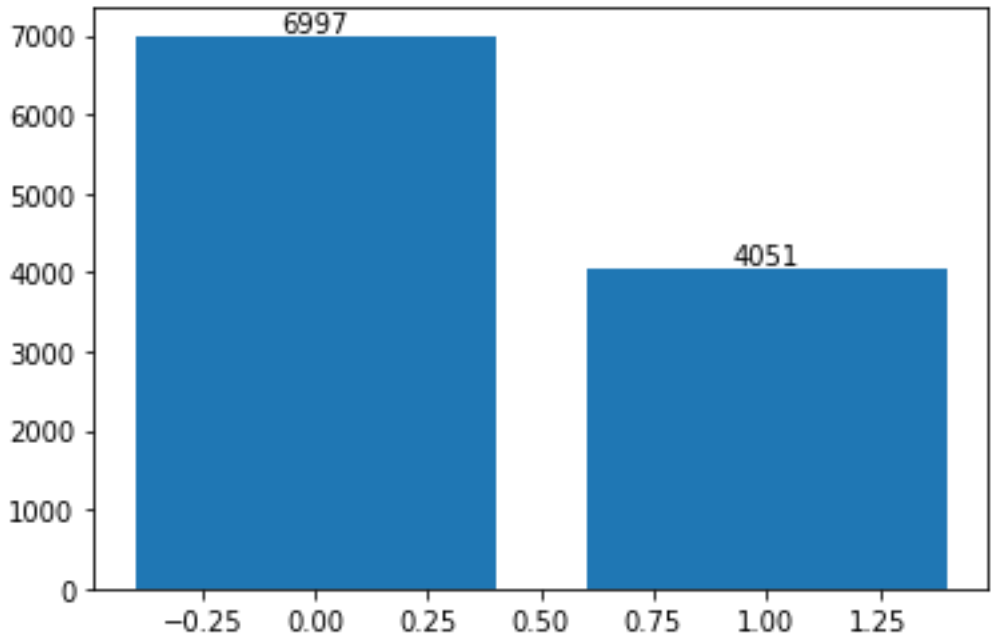


paidy

Metrics and results

The classification on the unlabeled data

Below is the classification results by imposing the rule.



paidy

Conclusions and remarks

The conflict between “making rules” and “correct classification”

- The results of using the proposed rules were not satisfactory.
- The problem of “imbalanced data”
- Relatively complex models(logistic/trees/k-nearest) imposed were able to produce better classification results
- However, they could not impose “rules” to execute that makes business sense
- Choosing “interpretability” over “precision” in this case

paidy

Conclusions and remarks

Additional suggestions & personal thoughts

- email domains whitelists could be provided to weed out domains that fall prey to easy abuse
- Needs more data and research to create the whitelist
- There could be potential security risks in the blue market and particular versions of OS systems
- “Analytics is art”
- Focus on solving “the actual question” over using particular methods

paidy

Thank you!