CREDIT CARD FRAUD DETECTION

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Credit Card Fraud Detection

Project Overview

Finex is a leading financial service provider based out of Florida, US. It offers a wide range of products and business services to customers through different channels, ranging from in-person banking and ATMs to online banking. Over the last few years, Finex has observed that a significantly large number of unauthorized transactions are being made, due to which the bank has been facing a huge revenue and profitability crisis. Many customers have been complaining about unauthorized transactions being made through their credit/debit cards. It has been reported that fraudsters use stolen/lost cards and hack private systems to access the personal and sensitive data of many cardholders. They also indulge in ATM skimming at various POS terminals such as gas stations, shopping malls, and ATMs that do not send alerts or do not have OTP systems through banks. Such fraudulent activities have been reported to happen during non-peak and odd hours of the day leaving no room for suspicion.

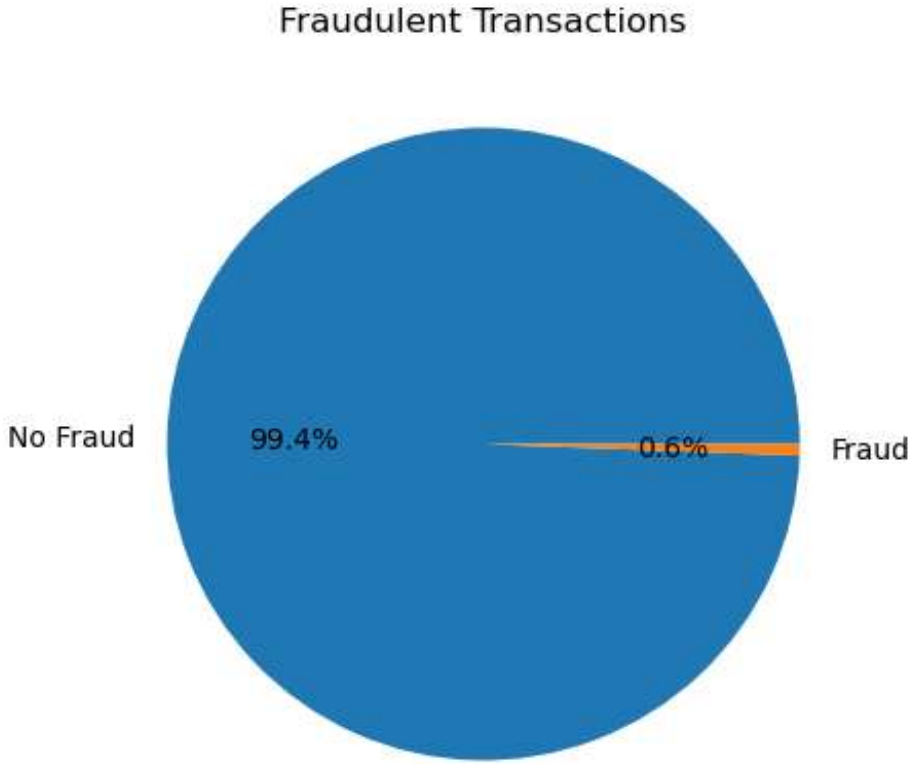
In most cases, customers get to know of such unauthorised transactions happening through their cards quite late as they are unaware of such ongoing credit card frauds or they do not monitor their bank account activities closely. This has led to late complaint registration with Finex and by the time the case is flagged fraudulent, the bank incurs heavy losses and ends up paying the lost amount to the cardholders.

Now, Finex is also not really equipped with the latest financial technologies, and it is becoming difficult for the bank to track these data breaches on time to prevent further losses. The Branch Manager is worried about the ongoing situation and wants to identify the possible root causes and action areas to come up with a long-term solution that would help the bank generate high revenue with minimal losses.

Credit Card Fraud Detection

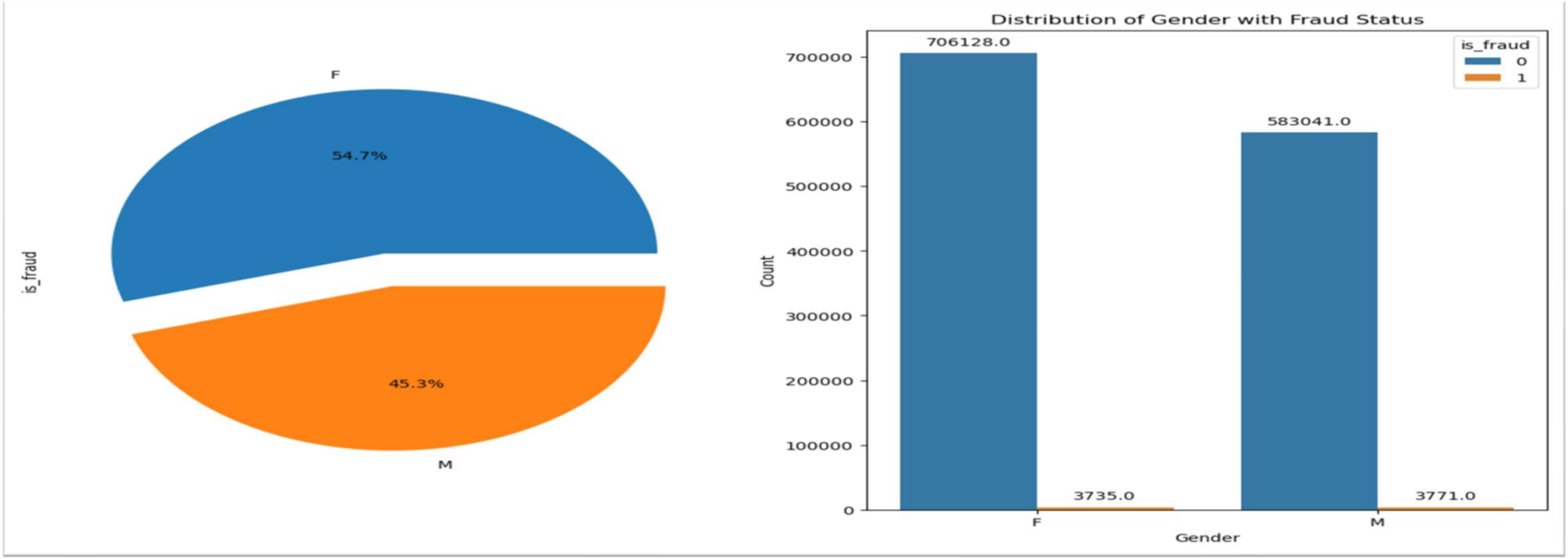
Data Collection and Preprocessing

Credit Card Fraud Detection



99.4% is not fraud and only 0.6% is fraud leads to imbalanced data.

Credit Card Fraud Detection



Females are doing more transactions but Males are more likely to make fraud transaction

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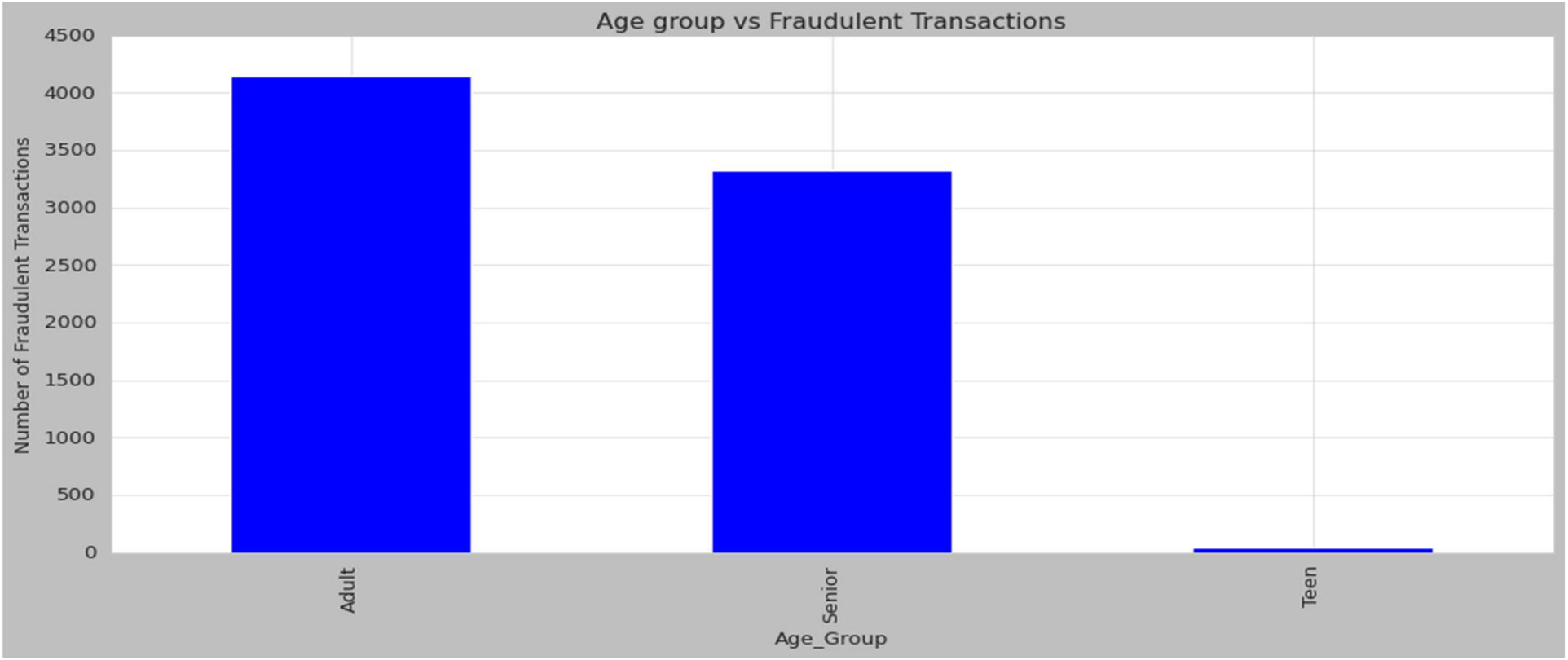

Adult are more likely to make fraud transaction

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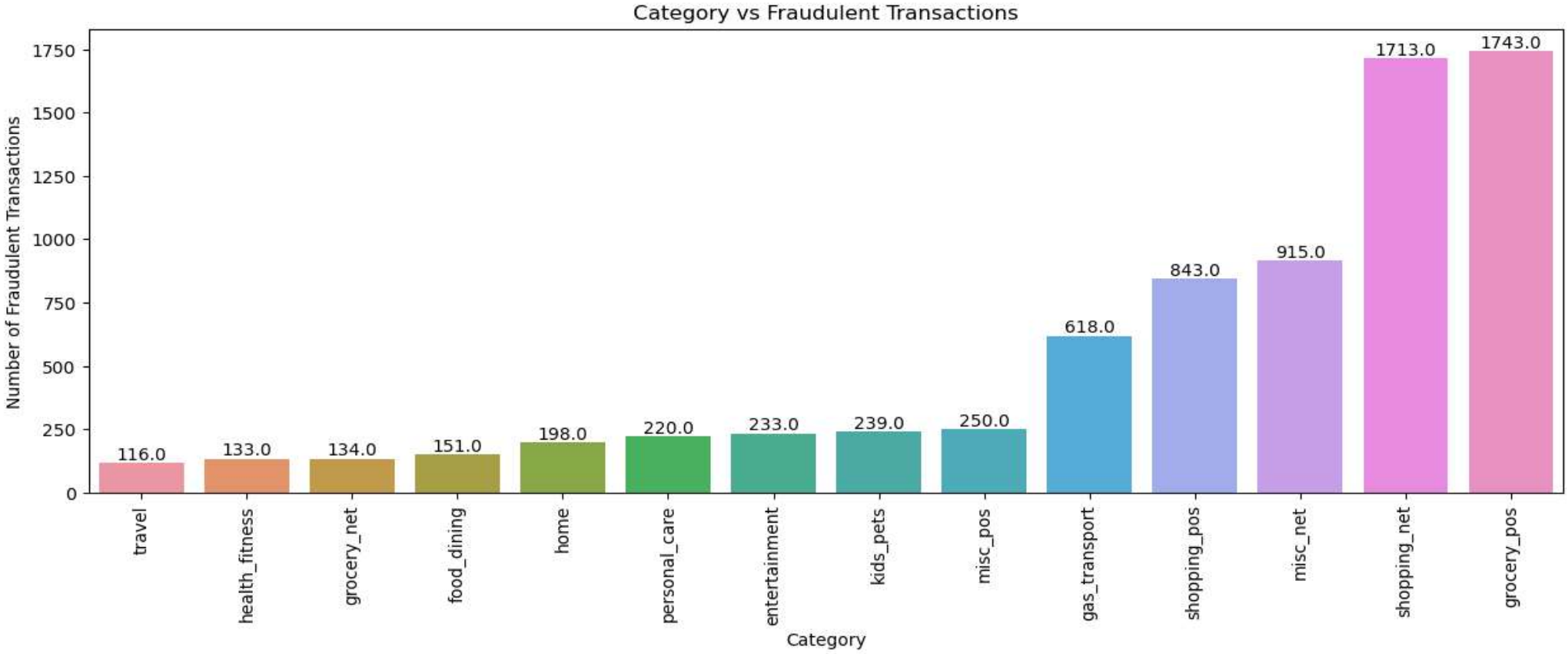

We saw that most of the fraud transaction happened for grocery_pos and shopping_net

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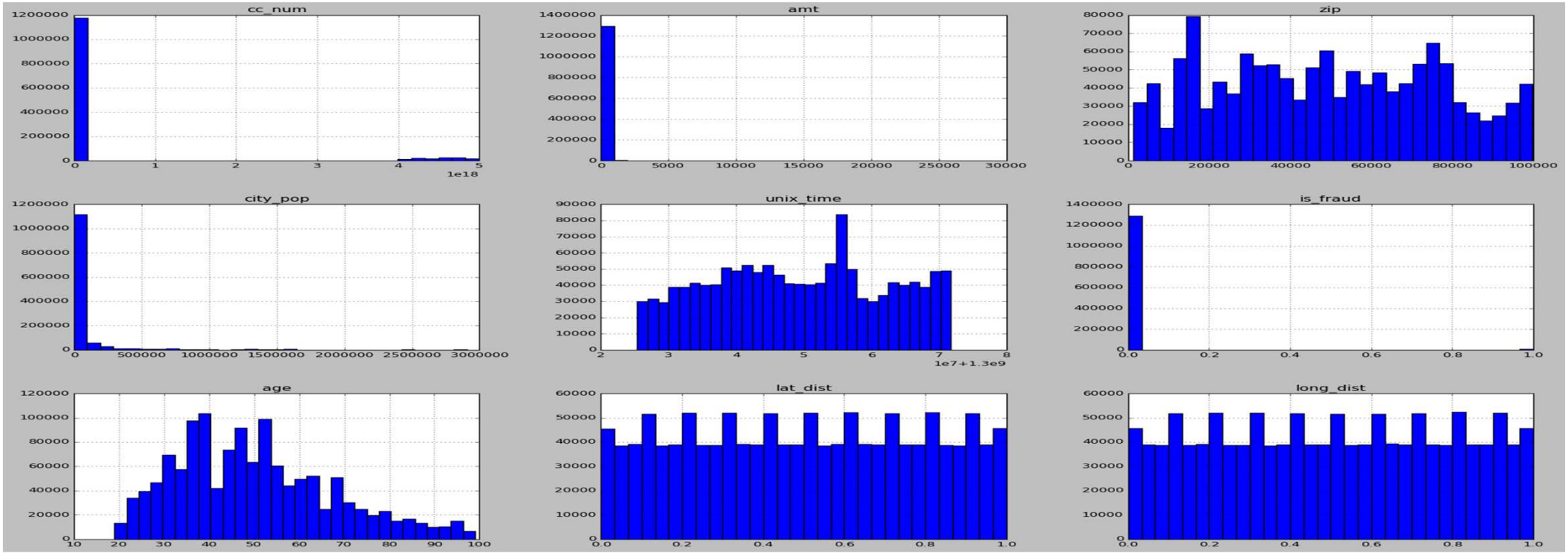

Plotted histogram for numerical columns to understand the distribution of data

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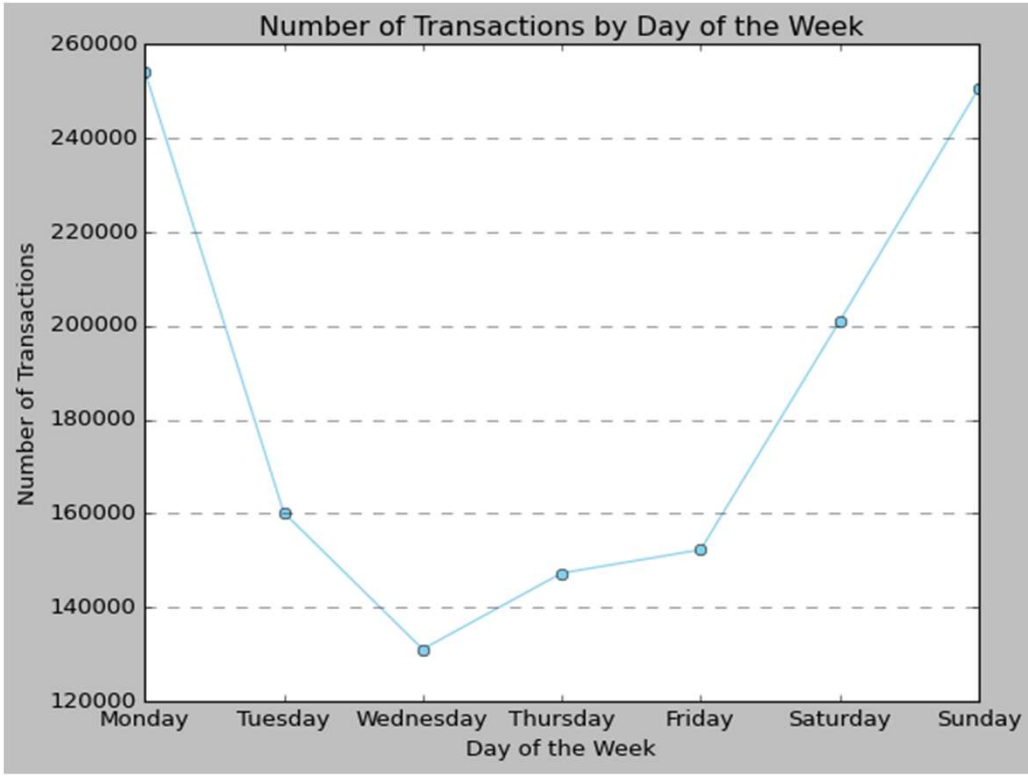

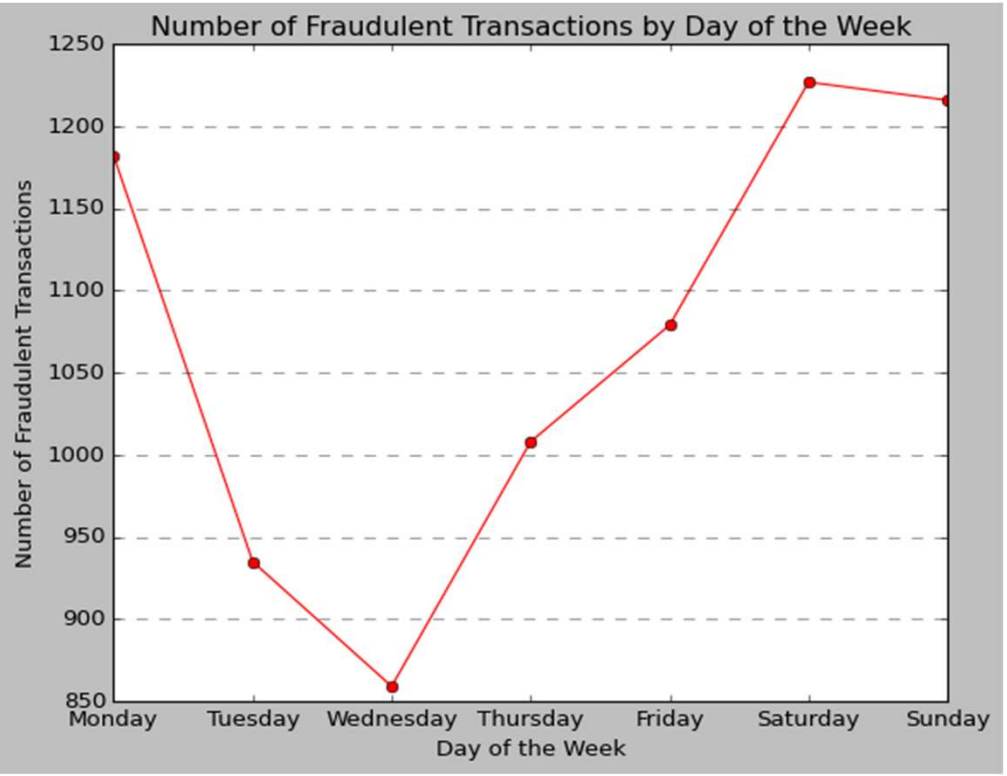

We saw that most of the Fraud transactions occur most frequently on Mondays, Saturdays and Sundays

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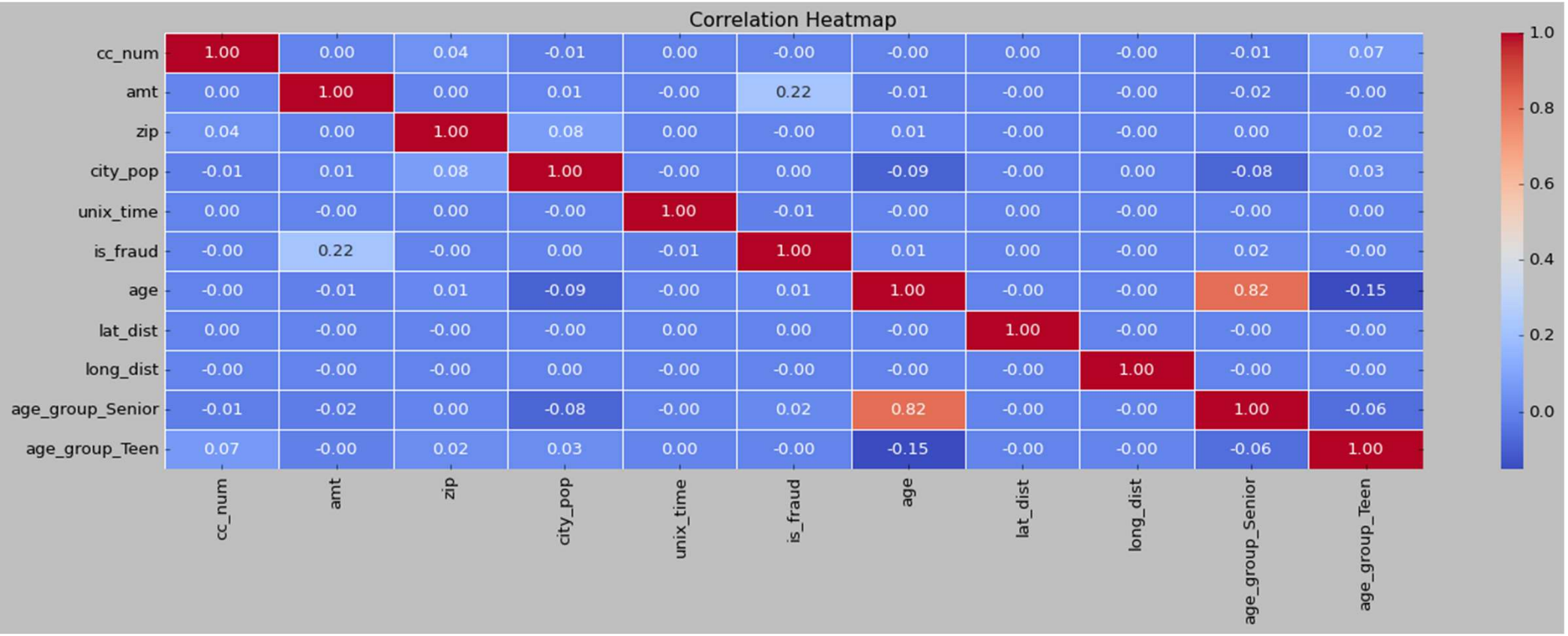

Created Heatmap to understand the correlation between variables

05188142674597185

Feature Selection

Using Recursive Feature Elimination, R2 scores : 0.05188142674597185

Using Multiple Linear Regression, R2 scores : 0.05188142674597185

RandomForestRegressor(max_depth=4, max_features=None, min_samples_leaf=2,
min_samples_split=4, n_estimators=200, random_state=42)
Train Data = 0.275287309046242
Test Data = 0.2693206944416 45

Using Gradient Boosting Regressor: Train Data = 0.275287309046242, Test Data = 0.269320694441645

Model Evaluation: Hyperparameter Tuning: Train score: 0.3979203402107758 Test score: 0.31175924786072773

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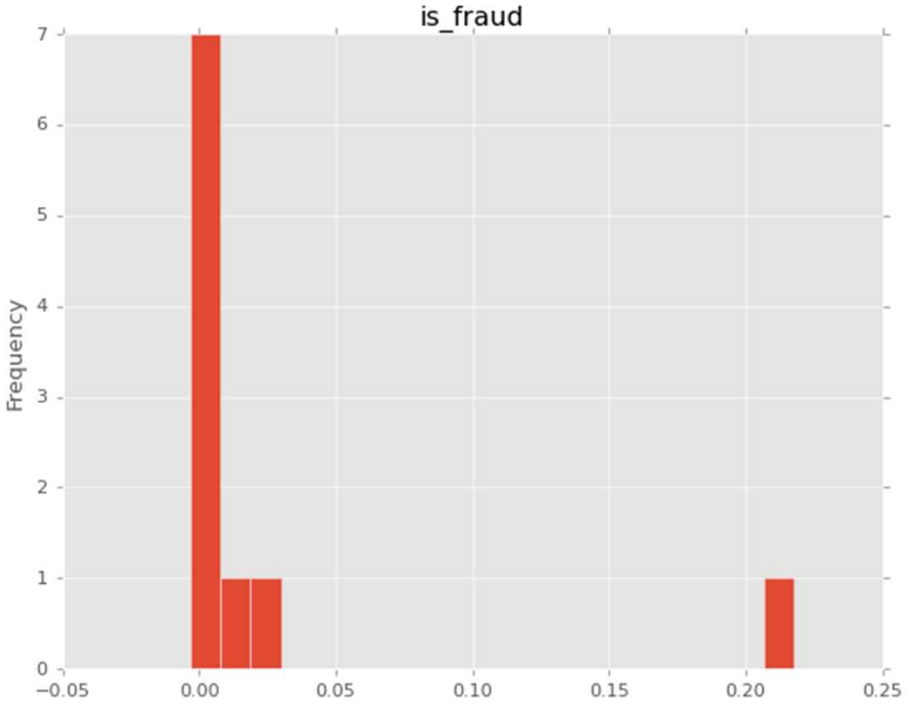

We got to know that fraud depends upon amt (Amount of transactions).