Predicting Credit Card Fraud for Kawartha Credit Union

Identify a Local Business:

Major banks handle millions of transactions daily and are comprised of tens of millions of members. Transactions of this quantity require extensive anti money laundering departments. Banks are required by law to provide adequate security measures to ensure that members of the bank are protected. Unfortunately, a lot of smaller banks lack flexibility making it difficult to introduce cutting edge technology into their cyber security departments. I strongly suggest that Kawartha Credit Union should look to establish a binary classification model to identify credit card fraud. KCU serves just over 50,000 people offering personal banking, loans, business banking, investment services, and insurance. Also, as the Kawartha Credit Union prides itself on being community-driven, they have programs supporting local initiatives over $3 million in donations to local charities.

Define a Problem or Opportunity:

Last year, around 62 million people in the US alone had experienced credit card fraud, which resulted in losses exceeding 6.2 billion dollars. Unfortunately credit card fraud is a global issue, and will always be present. Although, with the constant evolution of technology we now can identify trends that were never able to be seen before. This is why I want to tackle one of the most pressing topics to date, credit card fraud. I strongly believe that the KCU should implement a binary classification model to be used as a screener to determine the likelihood that a transaction is fraudulent. The KCU currently promises it will implement the most up to date tech to ensure that their members' money is safe. I believe a binary classification model would be an ideal fit. This model, once trained, will be able to provide you with a probability which you can then use to flag certain transactions to ensure legitimacy.

Data Required:

In order for this model to work all you need is the following numerical and categorical data. Firstly, credit card numbers would be very important to include as the model would then be able to have a baseline for transactions on the card. The next, most important data piece would be the transaction amount. This would be used to determine if there was a large spike in a person's expenditure which could indicate fraud. It would also be important to store whether a transaction was reported as fraudulent or not to train the model on what is the expected results. Storing the date and time of the transaction would also help the model, for example determining the frequency of transactions of a card. It also may be useful to store the merchant and the merchant type to determine if fraud was completed more often from a certain merchant or industry. The final piece of information that may be of use is storing the occupation of the card holder.

Dataset:

For a credit card fraud binary classification implementation a good dataset to begin with would be the Credit Card Fraud Dataset from Kaggle. This dataset contains over a million data entries all specific to identifying credit card fraud using machine learning.

Identify Challenges:

While implementing a binary classification model for credit card fraud detection can be extremely beneficial, it also comes with several challenges. The most important of which is the false negative rate. The false negative rate would correspond to the model's prediction that a transaction is not fraudulent, when in reality it is. Having a high false negative rate could cost the KCU money. In order to mitigate this I suggest that when implementing the software, provide extensive testing regarding the probability threshold that would flag someone to go to a secondary screener. This would help lower the false negative rate and save the company a significant amount of money.

Sources:

Dataset: https://www.kaggle.com/datasets/kartik2112/fraud-detection?select=fraudTrain.csv
KCU security policies: https://www.kawarthacu.com/security
Data amount credit card fraud: https://www.security.org/digital-safety/credit-card-fraud-report/