**The Problem**

Credit card fraud is a problem for many people across the United States,

with 45,428 cases of credit card fraud reported to the Federal Trade Commission in 2017.

With datasets available today, neural networks can be trained to identify trends

in fraudulent transactions and non-fraudulent transactions.

The output of these networks can be used to notify consumers of

suspicious activity on their accounts and prevent further losses.

**The Dataset**

For this case study, the dataset consists of over 280,000 credit card transaction data points accumulated over 2 days in European countries. Each data point holds basic information about the transaction as well as obfuscated data resulting from a PCA transformation, which can be seen in Table {sample-points}. The data prefixed with a “V” is the transformed data.

One of the interesting metrics of the dataset is the ratio of fraudulent to non-fraudulent transactions. With fraudulent transactions only making up 0.172% of the 280,000+ transactions, this poses a challenge for a neural to make accurate identifications for fraudulent cases. The fraudulent cases are also the most interesting result from the network, as simply identifying the 99.82800% of non-fraudulent cases is trivial.

**Sauces**

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