Overview

Addition Financial's Collections department reviews credit cards for payment delinquencies and defaults. Credit card delinquency occurs when a cardholder misses their required minimum monthly payment. Banks, credit unions, and credit card issuing companies monitor payment delinquencies to hedge against potential risk and to minimize losses when possible. Addition Financial's Collections team monitors four credit card delinquency queues; first payment default (when a new cardholder or an existing member with a new card type misses their first expected payment), 60 day delinquency, 90 day delinquency, and 120 day delinquency. Cards delinquent 120 days or more are considered non-performing loans and are submitted for charge-off. Once charged-off they are considered a loss to the company.

The Collections team works directly with the cardholder in an event where a cardholder appears in any of the aforementioned payment delinquency queues to help them fulfill their debt obligations.

Presently, the delinquency queues are based on a number of days delinquent counter that resets back to zero once the minimum required payment is made. The purpose of this competition is to determine which data points have relevance and build a data model that can predict whether a cardholder would become 70-89 days delinquent on their payment the following month and by what amount.

Problem

Addition Financial Credit Union (AFCU) seeks to automate Collections' monitoring process based on available historical payment data on a per member and card basis. The predictive analytics model should determine if members' credit cards would become 70-89 days delinquent the following month and by what amount. This predictive tool would help Collections team focus their efforts on helping members and mitigating any potential loss to the credit union.

Dataset

Contest participants will be provided anonymized historical credit card payment data.

Contest participants will also be provided with a data dictionary, describing each of the data points. It will be imperative for participants to have a clear understanding of the data that they are working with—as much of the data is industry specific. Explaining their findings in a clear & concise manner will be just as important as having accurate results.

Contest Structure

The primary goal of the contest is to create a measurable way to predict whether a credit card would become 70-89 days delinquent on their payment the following month and by what amount.
All entries will be judged based on the following criteria:
- Content in the Project Report
- Modeling Approach
- Results and Conclusions
- Presentation of results

Project codes must be written in R, Python, or Microsoft SQL.
Code file types should be compatible with the software used: (example:
R file should be in "*.r" (.rmd preferred), Python in "*.py" (.ipynb preferred), Microsoft SQL file should be in "*.sql").

Teams will be required to formally present their findings to the AFCU competition judges at the AFCU Headquarters located at 1000 Primera Blvd. Lake Mary, FL 32746.

Judges will need to replicate the analysis using the team's code/model on a validation dataset. Teams must provide formal instructions on how to run their model. Judging will be based on the application of the data, the method(s) used to reach conclusions, the number of significant relationships or correlations discovered, and the presentation of their findings. It is crucial that contest participants communicate their findings in layman's terms. Treat this assignment as if you were presenting to a group of decision makers that may not have strong background in rigorous statistical analysis.

Important Dates

Contest start date: September 30, 2022 (data files will be available on this date)
Final submissions due: January 9, 2023 (early submissions are encouraged)
Group presentations will be conducted between February 6, 2023 and February 17, 2023
UCF analytics dept. notification of top three winners: March 6, 2023

Prizes

AFCU is offering a worthy prize structure to incentivize participation:

1st Place: $3000

2nd Place: $1,500

3rd Place: $500

These amounts will be paid out split evenly among all team members. If the members wish to re-disburse the amounts among themselves, that is up to their discretion.

Questions & Contact Info

AFCU encourages students to contact us at any time with questions concerning the dataset. Please direct any questions you may have to Dept-BusinessIntelligence@additionfi.com

Data Dictionary

MonthEndDate: month end statement cycle ended.
SSN_id: randomly generated number representative of primary cardholder's SSN.
SSNJoint_id: randomly generated number representative of secondary cardholder's SSN.
Account_id: randomly generated number representative of account number linked to card number.
MostRecentLinkedCard_id: randomly generated number representative of most recently linked credit card number associated with related (linked) credit card account number.
CreditCard_id: randomly generated number representative of credit card number.
CardType: credit card BIN type.
CardNumberTransferDate: date the card account number was transferred to a new card number.
OpenDate: date the card account was added to the system.
CreditLine: maximum amount of credit that can be used.
LastStatementDate: date of the last closed statement billing cycle.
NextStatementDate: date of the next closed statement billing cycle.
LastStatementBalanceAmount: amount of the ending balance that appeared on the last statement.
LastStatementPurchaseAmount: amount of purchases that posted on the last statement.
LastStatementPurchaseReturnAmount: amount of returned transactions during statement cycle.
LastStatementMinimumPaymentDueAmount: amount of the minimum payment due that appeared on the last statement.
NextPaymentDueDate: date the next payment is required to be provided.
LastPaymentDate: date of the last payment that posted in a given month end.
PaymentEffectiveDate: date the payment was applied to the balance. This date determines how the interest is calculated on statement.
LastStatementPaymentTotalAmount: amount of payments that posted on the last statement.
CardExternalStatus: staff inputted status on the card account.
CardExternalStatusLastChangeDate: date the external status was last changed.
CardInternalStatus: system inputted status on the card account.
ActivityHistory1_12: payment activity for the last twelve statement cycles.

DelinquentDaysCount: number of days the cardholder's account is delinquent.

DelinquentDate: date the cardholder's account become delinquent.

DelinquentTotalAmount: amount delinquent regardless of cycle.

LifetimeDelinquent1CycleCount: number of times the cardholder's account cycled in a one cycle delinquent status since the open date.

LifetimeDelinquent2CycleCount: number of times the cardholder's account cycled in a two cycle delinquent status since the open date.

LifetimeDelinquent3CycleCount: number of times the cardholder's account cycled in a three cycle delinquent status since the open date.

LifetimeDelinquent4CycleCount: number of times the cardholder's account cycled in a four cycle delinquent status since the open date.

LifetimeDelinquent5CycleCount: number of times the cardholder's account cycled in a five cycle delinquent status since the open date.

LifetimeDelinquent6CycleCount: number of times the cardholder's account cycled in a six cycle delinquent status since the open date.

LifetimeDelinquent7CycleCount: number of times the cardholder's account cycled in a seven cycle delinquent status since the open date.

ChargeOffDate: date the cardholder's account was charged-off.

ChargeOffAmount: amount charged-off the card account.

Target: DelinquentDaysCount between 70 and 89 days.

Data Key for ActivityHistory1_12

DELINQUENCY	NO POSTINGS	DEBITS ONLY (purchases)	CREDITS ONLY (payments)	DEBITS & CREDITS (purchases and payments)
CURRENT	0	A	I	Q
30 DAYS (1 cycle)	1	B	J	R
60 DAYS (2 cycles)*	2	C	K	S
90 DAYS (3 cycles)*	3	D	L	T
120 DAYS (4 cycles)*	4	E	M	U
150 DAYS (5 cycles)*	5	F	N	V
180 DAYS (6 cycles)*	6	G	O	W
210 DAYS (7 cycles)*	7	H	P	X
CREDIT BALANCE	%	#	+	-
INACTIVE ACCOUNT; ZERO BALANCE	Z			

*REPORTED TO CREDIT BUREAU