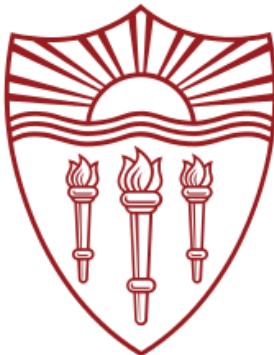


DSO 562 Fraud Analytics
Project 3 Report
Professor Coggeshall
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Transaction Fraud Detection

A Report on Building a Supervised Machine Learning Model on Credit
Card Transaction Data

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Executive Summary

This project focuses on using advanced analytical modeling techniques to find transaction fraud. Transaction fraud is a type of financial fraud that occurs during the usage process through unauthorized transactions. Example modes of transaction fraud include lost/stolen cards, counterfeit cards, or other account take-overs. Approximately 47% of US consumers have experienced transaction fraud, resulting in a \$40 billion global loss each year. Our goal was to use transaction fields to build a model for flagging potential transactional fraud in real-time.

Our dataset was collected from a US government organization and contained actual credit card purchases from January to December of 2010. The flagged frauds were synthetically generated from an industry expert with previous experience in card transaction behavior. The data contained over 96,000 records with transaction detail fields including the card number, merchant number, merchant state, merchant zip code, a description of the merchant, and the amount.

We started by cleaning the data set by mapping the missing merchant numbers, states, and zip codes and removed all transactions that weren't of purchase type. We created over 1,900 candidate variables by linking transaction information through different combinations of our original fields. These candidate variables included a day of the week risk table, days since last seen for a specific attribute, frequency which captures the number of times an attribute appears in the past n days, and velocity change, a ratio between recent occurrences and longer time periods. Additionally, we used natural language processing to assign transactions to an industry category and geographical information to track the distance between a purchase zip code and a customer's point of origin.

In order to prepare our dataset for model building, we used a filter and wrapper feature selection process to reduce the total number of variables. First, we ran a filter, which selected the top 200 variables with the highest average KS and FDR rank. Next, we used forward stepwise selection to get a well-ranked list of 15 different candidate variables.

Using our 15 most-important variables, we created 33 unique models from four different binary classification algorithms: Logistic Regression, Random Forest, XGBoost, and Neural Networks. Each of these models used a unique combination of sampling strategies and hyperparameters. Based on the best performance on the test set, we selected Random Forest, an ensemble algorithm, as our final model with 50 estimators, a max depth of 10 for each estimator, 300 min samples split, and a SMOTE oversampling technique. This model produced a fraud detection rate for 3% of the population at 63.13%. With our recommended cutoff of 5.9%, our model will provide an annualized financial savings of \$1.4 million. The success of our final model demonstrates a real business opportunity to implement our solution as an effective way of stopping transaction fraud saving money for our customers and the business.

Description of Data

Our dataset is sourced from actual credit card purchases from a US government organization over 12 months from January 1st, 2010 to December 31st, 2010. There are 10 fields and 96,753 records. The frauds are synthetic labels based on previous expert experience with credit card transactions. The record number tracks the time order and the Merchant number, Merch state, and Merch zip have missing values. Fraud is the only variable with 0 as a value, as a 1 flags a transaction as fraud and 0 represents a normal transaction. Below is a summary table detailing the percent of fields populated, the number of unique values, and the most common field value.

Field Name	Number of Records	Percent Populated	Number of Zeros	Unique Values	Most Common Field			
Cardnum	96,753	100.00%	0	1,645	5142148452			
Mechnum	93,378	96.51%	0	13,092	930090121224			
Merch description	96,753	100.00%	0	13,126	GSA-FSS-ADV			
Merch state	95,558	98.76%	0	228	TN			
Merch zip	92,097	95.19%	0	4,568	38118			
Transtype	96,753	100.00%	0	4	P			
Fraud	96,753	100.00%	95,694	2	0			
Field Name	Number of Records	Percent Populated	Unique Values	Mean	Standard Deviation	MIN Value	MAX Value	Most Common Field
Date	96,753	100.00%	365	N/A	N/A	2010-01-01	2010-12-31	2010-2-28
Amount	96,753	100.00%	34,909	427.89	10,006.14	0.01	3,102,045.53	3.62

Table 1.1: Summary Tables for All Fields in Dataset

For each field, we plotted the distribution and the most frequent occurrences to better understand the nature of our data before creating any candidate variables. Our plots were organized into a data quality report, which can be found in the appendix. The following distributions and bar charts highlight some important characteristics of our dataset.

Date

There are high peaks of fraud in the months of May and August. The pattern of no frauds remains consistent throughout the year, with a slight decline from October to December.

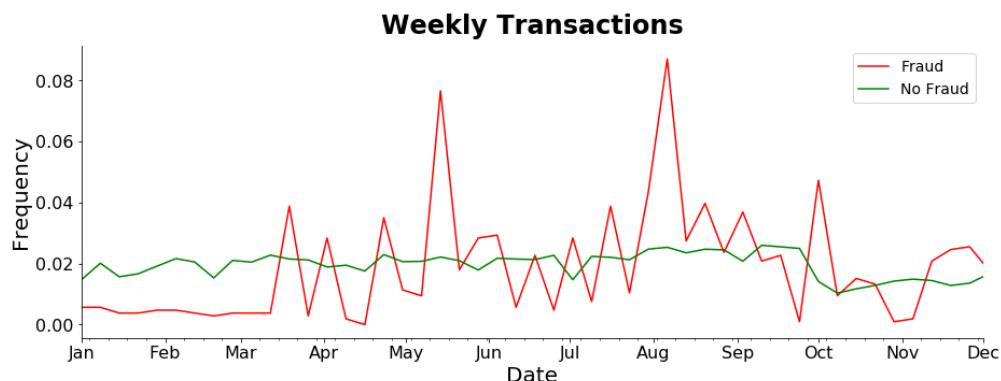


Figure 1.1: Distribution of Application Dates Over Time

Merch Zip

The merchant zip code with the highest number of transactions is located in Memphis, TN.

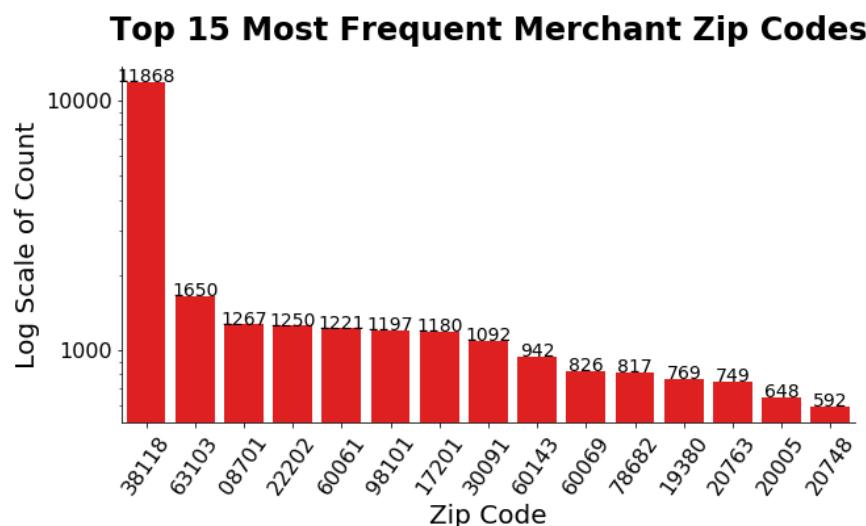


Figure 1.2: Most Frequent Social Security Numbers

Merch State

The top 5 states where merchants were frequently located in include: Tennessee, Virginia, California, Illinois, and Maryland.

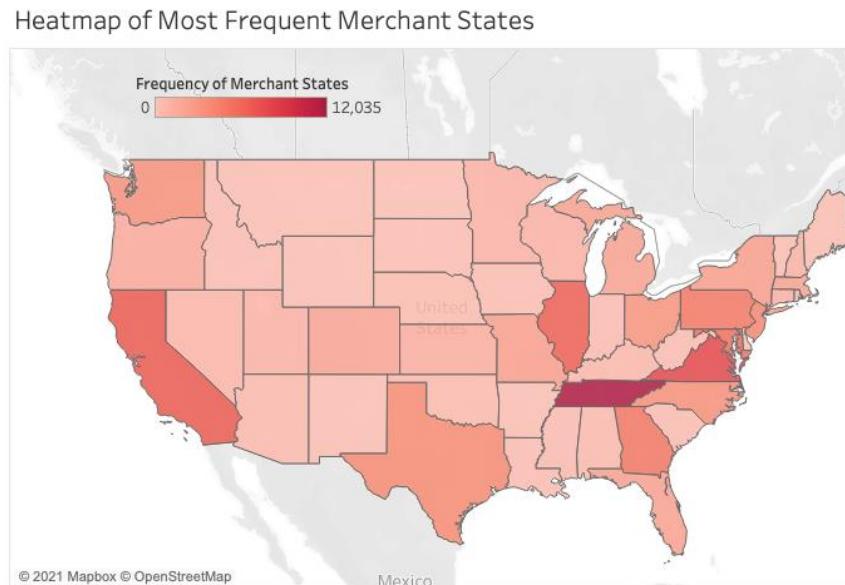


Figure 1.3 Most Frequent Applicant Address

Transaction Amount

Lower value transactions were the most common, particularly ones under \$10. The distribution of transaction amounts is right skewed.

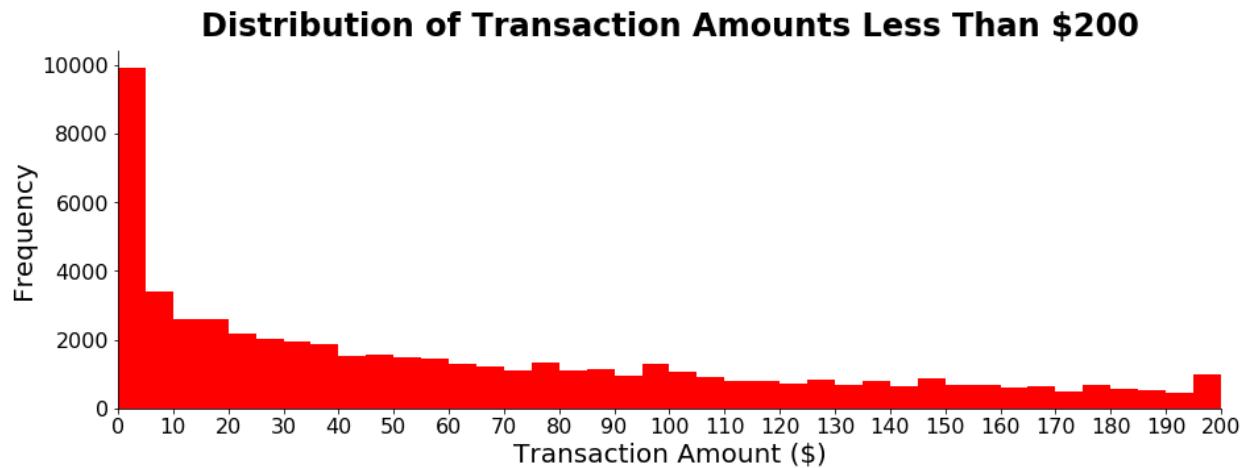


Figure 1.4 Most Frequent Phone Numbers

Data Cleaning

After initial investigation into the dataset, we discovered noisy records and some fields with missing values. As a result, we excluded the noisy data and performed data imputation before further analysis.

Exclusion

There were two categories of records that we needed to exclude from the dataset - outliers and non-purchase transaction types. An outlier was identified in the *Amount* field, with a value of '3,102,045.53', which was much higher than the rest of the dataset. The corresponding record had a *Merch description* value of 'INTERMEXICO', which led to us to believe that this transaction amount was in Mexican Pesos. Since the rest of our dataset were transactions in US Dollars, we decided to exclude this record as it wasn't suitable to include this transaction in a foreign currency.

In the *Transtype* field, each record is coded with a 1-character categorical value to represent its transaction type. We are only interested in the 'P' type records, which are the purchase transactions. Any records without a 'P' value for *Transtype* would likely be noise in our analysis. Therefore, we decided to exclude 355 records that had a 'A', 'D', or 'Y' value for *Transtype*, and only kept the 'P' type transactions in our dataset.

Data Imputation

In the dataset, we discovered that three data fields had missing values: *Merchnum*, *Merch state* and *Merch zip*. After performing the above exclusions, we filled in any missing values by mapping information from other fields of the same record.

For the *Merchnum* field, there were 3,195 records with missing values. To clean this data field, we first filled in missing values by mapping to the corresponding *Merch description*, as it is the most related field. With further examination, we discovered that some records had a *Merch description* value of 'RETAIL CREDIT ADJUSTMENT' or 'RETAIL DEBIT ADJUSTMENT' and were missing values across all the three data fields. Since these records were missing identifiable geographic information, we decided to fill in the missing values with 'unknown'.

For the *Merch state* field, there were 1,020 records with a missing value. We performed a multi-step procedure to clean this data field. First, we identified records with an existing *Merch zip* value but missing *Merch state* value and found 36 zip codes without an associated state. Then, we manually filled in these missing states by looking up corresponding zip codes on the USPS post office website. Next, we filled in the remaining missing values by mapping to the corresponding *Merchnum* and *Merch description*. We identified some non-US state values, such as 'BC', which was assumed to be British Columbia, a province in Canada. We decided to label

these non-US states as ‘foreign’ as these records are important for fraud transactions. Some records had a *Merch state* value of PR (Puerto Rico) and VI (Virgin Island). Since these are US territories, we decided not to label them as ‘foreign’.

For the Merch zip field, there were 4,300 records with missing values. We filled in the missing values by mapping to the corresponding *Merchnum* and *Merch description*. We did not map to *Merch state* because it is a 1:M relationship, and it is not desirable to fill in by computing the most common value.

Another consideration was to clean the merch description, as this field was often unique despite having a recurring merch number. We made a copy of the merch description field and removed any numbers and special characters. This stripped the merch description to specific words that could be used to match descriptions to the parent companies of local, regional branches that might have different merch numbers.

For any values that were still missing, we labeled them as ‘unknown’. We did not want to fill in missing values by computing the most common value after aggregating other fields because it would create unnecessary biased information in our data. ‘Unknown’ as a category is useful in this context. For instance, if a particular card was used multiple times at an unknown merchant or an unknown location, this information could be meaningful in making fraud detection.

Candidate Variables

After cleaning our dataset, we built 1,922 new variables from our original transaction data fields. Our goal for these candidate variables was to identify common modes of transaction fraud. This often includes a sudden burst of activity, differences in merchant locations, never before seen behavior, abnormally large purchases, and unusual recurring purchases. Each of our engineered variables attempt to capture these signals through frequency, velocity, tracking of common purchasing behaviors, and geocoding information.

We started with creating linking entities that would be used to track behaviors of a card and merchant over a specific time window. These linking fields were converted into unique attributes using combinations of our cardholder and merchant identity fields. These created attributes included card numbers at a specific merchant, merchant description, zip code, and state along with the original card number, merchant numbers, and our cleaned merchant description.

Another attribute we created was focused on tracking a user's purchasing behavior across a series of different categories. Using the merch description field, we used a web scraping tool and natural language processing technique to derive industry categories for each transaction. We used the Wikipedia package from python to parse and gather a short description on each company. We then looped through every word in the description and used fuzzy matching, a record linkage technique, to identify the word that matched with our list of industries. Any company that returned zero results or did not meet a threshold of a percentage match were assigned to an unknown category.

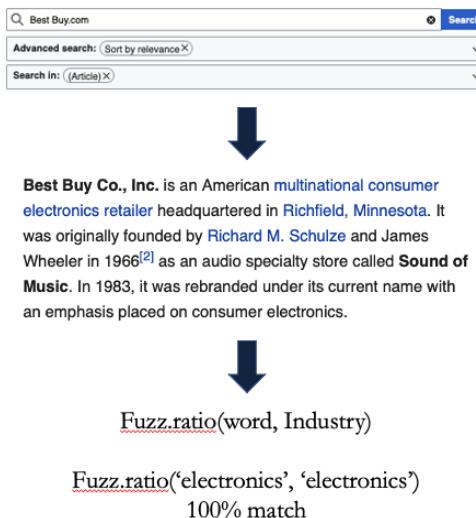


Figure 3.1: Flow-Chart of Purchase Category Attribute Process

This process completed 5000 unique searches of different companies and assigned each transaction into 25 different industry categories. This new category field was added to our list of attributes for numerical feature creation.

Our final step was to create numerical variables to be used in our model. The first variable created was dow_risk, which uses targeted encoding to assign the fraud proportion for the specific day of the week. To avoid overfitting, we used a smoothing formula with c=4 and nmid=20.

Our next set of variables focused on using time windows to capture the fraudulent purchasing activity. The $\{attribute\}_days_since$ variables show how many days have passed since that attribute was last observed. In case that attribute was not seen before, or in other words, this is the first time this attribute has appeared, the value was filled with 365. One example of this variable is *Amount_Cardnum_Merchnum_days_since*, which is the number of days since that same *card number* and *merchant number* occurred. A total of 8 days since variables were created.

The next variable type was the frequency, $\{attribute\}_count_n$, which captures the number of times that the same attribute has appeared in the past n days. For n, we chose 8 different time windows: 0, 1, 3, 7, 14, 30, 180, 365 days. As an example, *Amount_Cardnum_count_7* represents the number of times that the card number was seen in the last 7 days. We created 64 total variables of the frequency type, which were all the combinations of our 8 attributes and 8 time windows.

For tracking spending behavior, we calculated different summary statistics on our amount variables, $Amount_{attribute}_{statistic}_n$, over the past n days. These statistics included the mean, median and max along with ratios of the actual amount to these summary values. For example, *Amount_Cardnum_Merch zip sum_30* calculated the total amount this card number has spent in a single zip code over the last 30 days. This process created a total of 512 variables, which was a combination of our 8 summary statistics, 8 attributes, and 8 time windows.

The last type included the velocity change, $\{attribute\}_{count\ or\ amount}_{n_recent}_{n_past}$, which captures the ratio of the amount of times an attribute was seen in the last 0 and 1 days (n_recent) to the amount of times that same attributes was seen in past 3, 7, 14, 30, 180, 365 days (n_past). In other words, it finds the relative recent activity of an attribute compared to longer past periods. For instance, *Amount_Cardnum_count_0_by_7* is the proportion that a specific card number was seen in the past 0 day over the last 7 days. Using the combinations of the 3 attributes, two n_recent days, and six n_past days, we created 144 ($4*3*2*6$) variables of this type.

Velocity change Variables	$\frac{\left(\begin{array}{l} \text{Number} \\ \text{Amount} \end{array} \right) \text{ of transactions with same } \left(\begin{array}{l} \text{card} \\ \text{merchant} \end{array} \right) \text{ over the past } \left(\begin{array}{l} 0 \text{ days} \\ 1 \text{ day} \end{array} \right)}{\text{Average daily } \left(\begin{array}{l} \text{number} \\ \text{amount} \end{array} \right) \text{ of transactions with same } \left(\begin{array}{l} \text{card} \\ \text{merchant} \end{array} \right) \text{ over the past } \left(\begin{array}{l} 7 \text{ days} \\ 14 \text{ days} \\ 30 \text{ days} \end{array} \right)}$
--------------------------------------	--

Figure 3.2: Velocity Change Variables Formula

While the amount field was used for tracking the specific spending patterns of each of our attributes, we also wanted to take a geospatial approach by considering the distances at which transactions occurred. Generally, transactions are likely to occur close to a customer's point of origin, so these new variables would allow us to see at a geographical level, how and where a specific card is being used. Since we didn't have a stored card-user's address, we used a rolling window to track a customer's most common zip code to set, and update if needed, as the customer's point of origin. To calculate the distance between zip codes, we used the Haversine formula, which finds the distance, in kilometers, between two points (or zip codes) given their latitude and longitude positions.

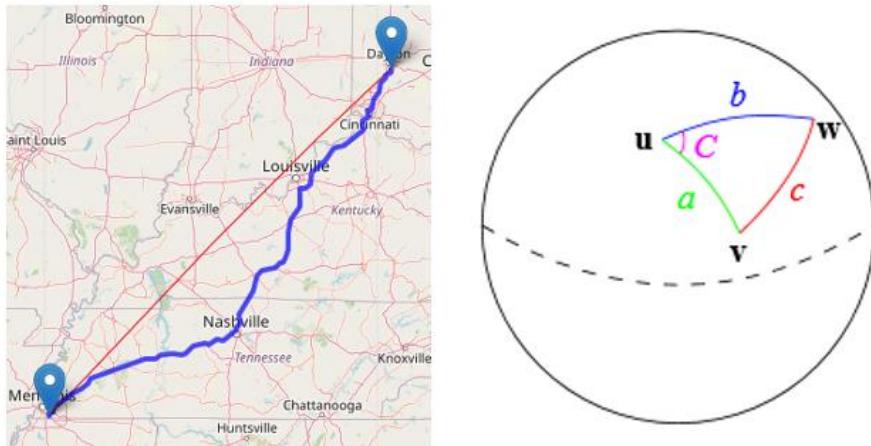


Figure 3.3: Haversine Distance Between Two Zip Codes

These distances were calculated for all transactions along with another field only calculating distances for transactions where we couldn't identify an industry/purchase category. The same summary statistics, frequency, and velocity change process across the different attributes for the amount fields was used for these two distance calculations. An example of one of these variables would be the total distance over a week of transactions from a card number's point of origin.

Each variable was assigned to either *Amount*, *OriginalMostDistance*, or *OriginalMostIndDistance* category to indicate which base numerical value was used when

calculating the candidate variable. This means we calculated the summary statistics and velocity change for each of these three groups, leading to a total of 1,922 candidate variables.

A full list of all the created candidate variables can be found in the appendix.

Feature Selection Process

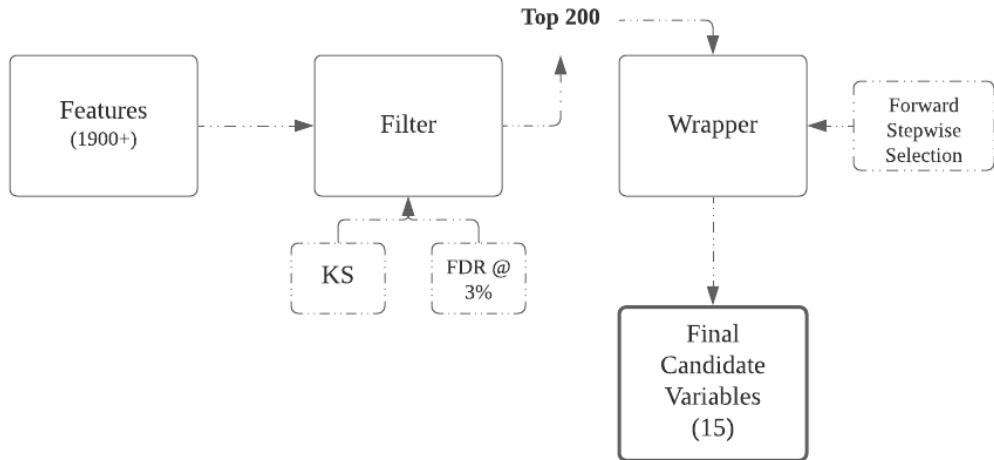


Figure 4.1: Feature Selection Flow Chart

After creating more than 1900 features, it became necessary to reduce dimensionality and find the most informative, substantial variables for our prediction purposes. By reducing the number of features, our model would have fewer chances of fitting data noise and thus improve overall prediction accuracy. In this feature selection process, we implemented a 2-step method to obtain a final list of 15 key variables to use for our model building.

Filter Method

Our first step for feature selection was to apply a filter to reduce the feature list from over 1900 to 200, in order of how individually important each was to predicting the fraud label. The filter method is fast and stable, which enables us to quickly sort and rank the potentially useful candidate variables without running any time-consuming algorithms.

We calculated two metrics, Kolmogorov-Smirnov (KS) statistic and Fraud Detection Rate (FDR) at 3% of the population and created a synthetic score by averaging their ranks in order of importance. The KS score is a measure of how separated two classes are given one candidate variable. Therefore, a variable is considered more important to our prediction target if it has a higher KS statistic, as it can help us better distinguish data points between two classes (fraud and non-fraud). The FDR at 3%, on the other hand, measures the percentage of all fraud found for a single, sorted candidate variable. Fraud is by nature extremely hard to detect and an event that happens relatively rarely in the real-life situations, so a strong candidate variable has to perform

well even if only a small amount of data is given. Therefore, we calculated KS and FDR and averaged them to get a balanced measure of importance.

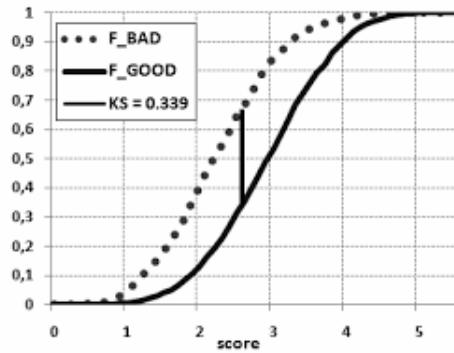


Figure 4.2: KS Statistic Explanation - A measure of how separated two classes are given each candidate variable

To make sure our scoring was reliable, we added 1 special variable to the list of candidate variables: a copy of the fraud label, which should return the highest rank. As we saw in the output, the fraud label copy was ranked at top, which indicated we had precise calculations and ensured the reliability of this sorted list.

VariablePerformance

Variable	KS	FDR	rank_ks	rank_FDR	average_rank
Fraud	1	1	1923	1923	1923
Amount_Cardnum_Merch_description_sum_7	0.685688445	0.638248848	1922	1920	1921
Amount_Cardnum_Merch_description_sum_3	0.68053462	0.642857143	1919	1921.5	1920.25
Amount_Cardnum_Merch zip_sum_7	0.685024477	0.6359447	1921	1919	1920
Amount_Cardnum_Merch zip_sum_3	0.677975652	0.642857143	1917	1921.5	1919.25
Amount_Cardnum_Merchnum_sum_7	0.681485709	0.632488479	1920	1917	1918.5
Amount_Cardnum_Merch_description_sum_14	0.678121007	0.634792627	1918	1918	1918
Amount_Cardnum_Merchnum_sum_3	0.675554862	0.631336406	1916	1916	1916
Amount_Cardnum_Merchnum_sum_14	0.675339521	0.630184332	1915	1914.5	1914.75
Amount_Cardnum_Merch state_sum_3	0.674526609	0.630184332	1914	1914.5	1914.25

Table 4.1: Sorted Rank of Candidate Variables Based on Average Score of KS and FDR, Top 10

VariablePerformance

Variable	KS	FDR	rank_ks	rank_FDR	average_rank
OriginalMostDistance_Cardnum_Industry_sum_3	0	0.012672811	182.5	172.5	177.5
OriginalMostDistance_Cardnum_Industry_median_3	0	0.012672811	182.5	172.5	177.5
OriginalMostDistance_Cardnum_Industry_max_3	0	0.012672811	182.5	172.5	177.5
OriginalMostDistance_Cardnum_Industry_mean_3	0	0.012672811	182.5	172.5	177.5
OriginalMostDistance_Cardnum_Industry_sum_1	0	0.012672811	182.5	172.5	177.5

Table 4.2: Sorted Rank of Candidate Variables Based on Average Score of KS and FDR, Bottom 5

Wrapper Method

After finding the top 200 candidate variables from the KS-FDR filter, we further reduced the number of candidate variables by applying a wrapper method, specifically a forward stepwise selection method. The method builds a single classification model using each variable individually first and chooses the most significant one (based on the highest ROC-AUC) to place in the base model. This process will continue until the ROC-AUC can no longer be improved. We decided to use logistic regression as the underlying model due to its effectiveness and simpleness. For stability, we ran this process a few times (changing the scoring metric to FDR at 3%) to have more confidence in our best subset of features. As a result, a rank-ordered list of 15 variables were returned and selected to be tested in our model algorithms.

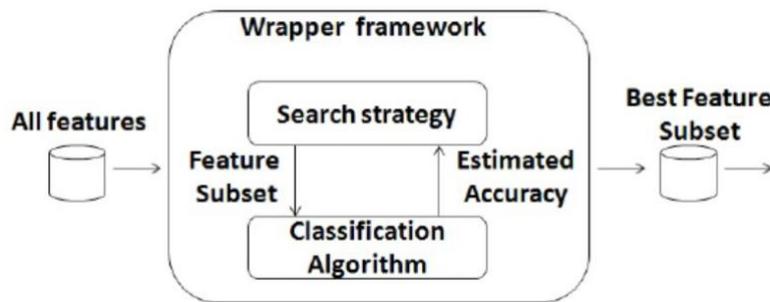


Figure 4.2: Wrapper Method Explanation - This method uses an algorithm to select the best candidate variables

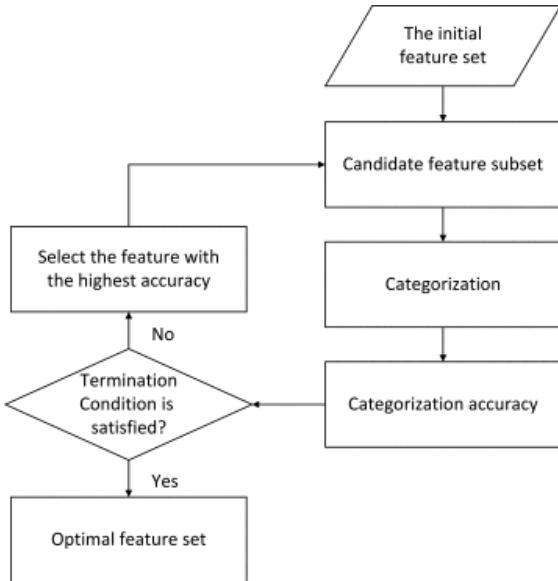


Figure 4.3: Forward Stepwise Selection Explanation

Variable Name	Description
Amount_Cardnum_Merch_description_sum_7	Sum of transaction amount by this card with this merchant description in past 7 days
Amount_Merchnum_actual/median_365	Actual transaction amount divided by median transatction amount by this merchant in past 365 days
Amount_Cardnum_sum_1	Sum of transaction amount by this card in past 1 day
Amount_Cardnum_Merch_description_max_7	Max of transaction amount by this card with this merchant description in past 7 days
Amount_Cardnum_Merchnum_sum_30	Sum of transaction amount by this card at this merchant in past 30 days
Amount_Merchnum_max_1	Max transaction amount by this merchant in past 1 day
Amount_Merchnum_max_3	Max transaction amount by this merchant in past 3 days
Amount_Merchnum_max_14	Max transaction amount by this merchant in past 14 days
Amount_Cardnum_Merch zip_median_180	Median of transaction amount by this card at this merchant zip code in past 180 days
Amount_Cardnum_Merch zip_max_30	Max of transaction amount by this card at this merchant zip code in past 30 days
Amount_Cardnum_sum_3	Sum of transaction amount by this card in past 3 days
Amount_Cardnum_Industry_sum_0	Sum of transaction amount by this card in this industry in past 0 day
Amount_Cardnum_median_30	Median of transaction amount by this card in past 30 days
Amount_Cardnum_Merch_description_sum_14	Sum of transaction amount by this card with this merchant description in past 14 days
Amount_Cardnum_Merchnum_sum_1	Sum of transaction amount at this merchant in past 1 day

Table 4.3: A Final List of 15 Candidate Variables Selected

Based on the output of the wrapper method, rank ordered with top variable being the most informative

Model Algorithms

As we are attempting to identify transactions as potential fraud, the most appropriate modeling approach was to build a binary classification model. Before training our models, we split our data into two sets: a train and test set made up of applications prior to November 1st, 2010 and an out-of-time (OOT) set made of applications that we received after November 1st, 2010. Our train and test data were split into a 75% training group and a 25% testing group. For predictions based on the out-of-time set, we trained the model using the full train and test set.

Since roughly 1.10% of our fields were flagged as frauds, we had an imbalanced class issue. As a remedy, we utilized three different sampling techniques: undersampling, SMOTE, and tuning the weight parameter within the algorithm. Undersampling is a technique where you down sample the majority class to meet a specific ratio with the minority class. Synthetic minority oversampling technique (SMOTE) can be used to synthetically generate more observations from the minority class, by taking the nearest neighbors of all “bad” records and creating similar ones. Lastly, some algorithms have a weight parameter to inform the model of different class weights. We used a ratio of 10 “goods” to 1 “bad” as our parameter setting for some models to place more emphasis on the “bad” records by minimizing the ratio between the two classes.

Due to a relatively low sample size, we observed a fair amount of variance in model performance from run-to-run. In order to make sure we were getting results reflective of the actual model performance we ran each model 10 times, building on a random train test split (75-25) and then taking the average across the 10 runs.

We tested four different algorithms across many different hyperparameters to determine which method would be the most effective in finding identity fraud.

Logistic Regression

Our first algorithm used logistic regression, a linear classifier algorithm. This algorithm outputs a probability of a record being identified as fraud by using the logistic sigmoid function which forms a sideways S curve on a graph. In order to map these probabilities to a prediction, we use a linear decision boundary to assign records to specific classes. The hyperparameters we controlled for in our model were the penalty parameter which controls regularization, C another regularization term, and the solver which is used for optimizing the algorithm.

Model	Parameters						Average FDR at 3%		
	Iteration	Sampling Strategy (Majority:Minority)	Penalty	C	Solver	Train	Test	OOT	
Logistic Regression	1	No Sampling	I2	1	lbfgs	31.73	31.23	15.25	
	2	No Sampling	I1	1	lblinear	65.18	65.04	37.21	
	3	Class Weighting (10:1)	I1	1	lblinear	65.20	63.86	38.99	
	4	SMOTE(70:30)	I1	0.1	lblinear	64.98	65.45	38.83	
	5	SMOTE(70:30)	I1	1	lblinear	65.62	63.75	37.43	
	6	SMOTE(30:70)	I2	0.1	lblinear	46.27	45.50	24.08	
	7	Class Weighting (10:1)	I1	1	saga	50.65	51.09	29.94	
	8	No Sampling	I2	1	lblinear	47.20	45.32	24.69	
	9	Class Weighting (10:1)	I1	0.1	lblinear	65.65	63.41	40.50	

Table 5.1 Logistic Regression Hyperparameter Performance Table

Random Forest

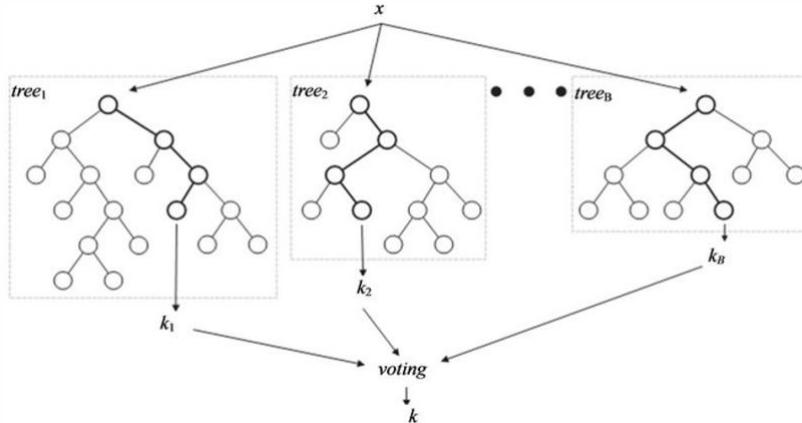


Figure 5.1: Random Forest Explanation: A collection of many strong models with averaged scoring

The next modeling algorithm we tried was a Random Forest, an ensemble method that averages many strong decision tree models to build a more accurate and stable prediction. On a high level, a decision tree works by carving up spaces into boxes and assigns a model output for each carved box. Random Forest builds a collection of many of these decision tree models, selecting a random subset of variables or records, and votes based on the outputs of each model to flag a record as fraud or not. We tried a wide range of hyperparameters, including the number of trees, the depth of each tree, the criterion to measure the quality of each split, and the minimum number of samples required to split an internal node.

Model	Parameters						Average FDR at 3%		
	Iteration	Sampling Strategy (Majority:Minority)	criterion	n_estimators	max_depth	min_samples_split	Train	Test	OOT
Random Forest	1	No Sampling	gini	100	15	200	96.98	84.68	63.41
	2	No Sampling	gini	50	15	200	96.85	83.55	62.51
	3	No Sampling	gini	50	10	300	85.06	79.73	61.34
	4	Class Weighting (10:1)	gini	50	10	300	86.48	81.59	57.99
	5	Class Weighting (10:1)	entropy	50	10	300	88.85	80.41	49.33
	6	SMOTE(70:30)	gini	50	10	300	85.26	80.77	62.40
	7	SMOTE(70:30)	entropy	50	10	300	93.36	83.09	58.32
	8	UnderSampling (20:80)	gini	100	15	300	94.85	83.32	62.29
	9	SMOTE(70:30)	entropy	50	5	300	93.26	82.68	56.15

Table 5.2 Random Forest Hyperparameter Performance Table

XGBoost

Another modeling algorithm we tested was XGBoost, a gradient boosting algorithm. XGBoost iteratively trains a series of weak models, correcting the previous errors to result in stronger predictions. These additional models will continue to be added sequentially until no further improvements can be made. It uses a gradient descent algorithm as a way of minimizing the errors for each new tree that is added to the model. We focused on tuning the number of trees, the learning rate for preventing overfitting, the max depth of each tree, and the ratio for sampling the training data prior to building any trees.

Model	Parameters						Average FDR at 3%		
	Iteration	Sampling Strategy (Majority:Minority)	learning_rate	n_estimators	max_depth	subsample	Train	Test	OOT
XGBoost	1	No Sampling	0.1	100	3	1	87.94	84.36	53.24
	2	No Sampling	0.1	250	3	0.8	91.29	84.82	51.17
	3	No Sampling	0.05	500	3	0.1	92.38	87.05	52.79
	4	Class Weighting (10:1)	0.1	100	3	1	87.80	85.36	53.13
	5	Class Weighting (10:1)	0.05	250	3	1	90.39	84.41	54.58
	6	SMOTE (70:30)	0.1	100	3	1	87.32	83.18	53.07
	7	SMOTE (70:30)	0.05	500	3	1	95.36	89.05	55.42
	8	No Sampling	0.03	1000	3	1	96.15	89.64	55.75
	9	UnderSampling (1:10)	0.1	100	3	1	87.98	83.86	52.57

Table 5.3 XGBoost Hyperparameter Performance Table

Neural Networks

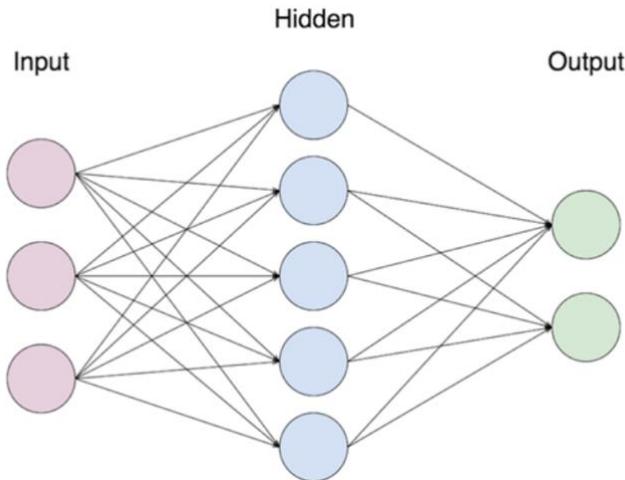


Figure 5.2 Simple Neural Network with One Hidden Layer and 5 Nodes

Our last modeling algorithm was a neural network, a method that attempts to mimic human brain activity by using a set of hidden layers and nodes. Each node receives a weighted signal from all the previous layer's nodes and performs a transformation on the linear combinations of all these signals. The data is passed through this model many times, called epochs, and each epoch attempts to reduce the error of the previous run. During each epoch, the weights of the signals are adjusted from each data record, until the weights are tuned to the local optimal point. The hyperparameters that we set were the number of epochs, the number of nodes, and the optimization function.

Model	Parameters							Average FDR at 3%		
	Iteration		optimizer	layers	nodes	epochs	activation	Train	Test	OOT
Neural Networks	1	No Sampling	adam	2	20	10	sigmoid	65.56	66.27	30.84
	2	No Sampling	adam	2	16	15	sigmoid	66.26	64.77	31.51
	3	No Sampling	adam	2	16	15	relu	66.38	65.45	39.11
	4	No Sampling	adam	1	8	10	sigmoid	64.74	66.27	29.78
	5	No Sampling	adam	2	20	15	relu	34.83	34.41	22.29
	6	SMOTE(70:30)	adam	2	16	15	relu	66.79	66.95	39.05

Table 5.4 Neural Network Hyperparameter Performance Table

Results

After creating 33 models across four different base algorithms, we discovered that our best performing model was a Random Forest algorithm with a 62.4% fraud detection rate at 3% for the out of time data set. We selected a stable Random Forest model with a lower OOT FDR to mitigate overfitting, as this model degraded much less from Train to Test to OOT and had only marginally worse OOT performance compared to our highest FDR model. The hyperparameters were set to:

- Trees: 50
- Split Criterion: Gini
- Tree Max Depth: 10
- Minimum Samples Split: 300

The full model performance table can be found in the appendix.

Model	Parameters							Average FDR at 3%		
	Iteration	Sampling Strategy (Majority:Minority)	Penalty	C	Solver			Train	Test	OOT
Logistic Regression	1	Class Weighting (10:1)	l1	0.1	liblinear			65.65	63.41	40.50
	8	No Sampling	0.03	1000	3	subsample		96.15	89.64	55.75
XGBoost	Iteration	Sampling Strategy (Majority:Minority)	learning_rate	n_estimators	max_depth	subsample		Train	Test	OOT
	6	SMOTE(70:30)	gini	50	10	min_samples_split		Train	Test	OOT
Random Forest	Iteration	Sampling Strategy (Majority:Minority)	criterion	n_estimators	max_depth	min_samples_split		Train	Test	OOT
	3	No Sampling	adam	2	16	15	relu	66.38	65.45	39.11
Neural Networks	Iteration		optimizer	layers	nodes	epochs	activation	Train	Test	OOT
	6	SMOTE(70:30)	adam	2	16	15	relu	85.26	80.77	62.40

Table 6.1 Performance Table of the Four Highest Performing Models: One iteration selected from each model

In the training set the top population bin was comprised of over 58.6% fraudulent records, with similar results across test, and out of time. This model helps ensure that investigators have to sift through minimal numbers of false positives.

Training	# Records		# Goods		# Bads		Fraud Rate					
	62999		62339		660		0.010476357					
Population Bin %	Bin Statistics						Cumulative Statistics					
	# Records	# Goods	# Bads	% Goods	% Bads	Total # Records	Cumulative Goods	Cumulative Bads	% Goods	% Bads (FDR)	KS	FPR
1	628	241	387	38.38%	61.62%	628	241	387	0.39%	58.64%	58.25	0.62
2	630	499	131	79.21%	20.79%	1258	740	518	1.19%	78.48%	77.30	1.43
3	630	593	37	94.13%	5.87%	1888	1333	555	2.14%	84.09%	81.95	2.40
4	630	597	33	94.76%	5.24%	2518	1930	588	3.10%	89.09%	85.99	3.28
5	630	610	20	96.83%	3.17%	3148	2540	608	4.07%	92.12%	88.05	4.18
6	630	618	12	98.10%	1.90%	3778	3158	620	5.07%	93.94%	88.87	5.09
7	630	626	4	99.37%	0.63%	4408	3784	624	6.07%	94.55%	88.48	6.06
8	630	623	7	98.89%	1.11%	5038	4407	631	7.07%	95.61%	88.54	6.98
9	630	626	4	99.37%	0.63%	5668	5033	635	8.07%	96.21%	88.14	7.93
10	630	628	2	99.68%	0.32%	6298	5661	637	9.08%	96.52%	87.43	8.89
11	630	629	1	99.84%	0.16%	6928	6290	638	10.09%	96.67%	86.58	9.86
12	630	630	0	100.00%	0.00%	7558	6920	638	11.10%	96.67%	85.57	10.85
13	630	629	1	99.84%	0.16%	8188	7549	639	12.11%	96.82%	84.71	11.81
14	630	629	1	99.84%	0.16%	8818	8178	640	13.12%	96.97%	83.85	12.78
15	630	628	2	99.68%	0.32%	9448	8806	642	14.13%	97.27%	83.15	13.72
16	630	629	1	99.84%	0.16%	10078	9435	643	15.13%	97.42%	82.29	14.67
17	630	628	2	99.68%	0.32%	10708	10063	645	16.14%	97.73%	81.58	15.60
18	630	628	2	99.68%	0.32%	11338	10691	647	17.15%	98.03%	80.88	16.52
19	630	629	1	99.84%	0.16%	11968	11320	648	18.16%	98.18%	80.02	17.47
20	630	630	0	100.00%	0.00%	12598	11950	648	19.17%	98.18%	79.01	18.44

Table 6.2 Training Results

Our process was validated by an equally impressive test dataset prediction, with excellent results across FDR, purity, and KS. Of the 21,000 records, almost 118 of the 220 frauds were caught in the 1% population bin.

Test	# Records		# Goods		# Bads		Fraud Rate					
	21000	20780			220		0.01047619					
Population Bin %	Bin Statistics						Cumulative Statistics					
	# Records	# Goods	# Bads	% Goods	% Bads	Total # Records	Cumulative Goods	Cumulative Bads	% Goods	% Bads (FDR)	KS	FPR
1	208	90	118	43.27%	56.73%	208	90	118	0.43%	53.64%	53.20	0.76
2	210	171	39	81.43%	18.57%	418	261	157	1.26%	71.36%	70.11	1.66
3	210	197	13	93.81%	6.19%	628	458	170	2.20%	77.27%	75.07	2.69
4	210	199	11	94.76%	5.24%	838	657	181	3.16%	82.27%	79.11	3.63
5	210	205	5	97.62%	2.38%	1048	862	186	4.15%	84.55%	80.40	4.63
6	210	207	3	98.57%	1.43%	1258	1069	189	5.14%	85.91%	80.76	5.66
7	210	209	1	99.52%	0.48%	1468	1278	190	6.15%	86.36%	80.21	6.73
8	210	205	5	97.62%	2.38%	1678	1483	195	7.14%	88.64%	81.50	7.61
9	210	206	4	98.10%	1.90%	1888	1689	199	8.13%	90.45%	82.33	8.49
10	210	210	0	100.00%	0.00%	2098	1899	199	9.14%	90.45%	81.32	9.54
11	210	210	0	100.00%	0.00%	2308	2109	199	10.15%	90.45%	80.31	10.60
12	210	208	2	99.05%	0.95%	2518	2317	201	11.15%	91.36%	80.21	11.53
13	210	208	2	99.05%	0.95%	2728	2525	203	12.15%	92.27%	80.12	12.44
14	210	210	0	100.00%	0.00%	2938	2735	203	13.16%	92.27%	79.11	13.47
15	210	208	2	99.05%	0.95%	3148	2943	205	14.16%	93.18%	79.02	14.36
16	210	209	1	99.52%	0.48%	3358	3152	206	15.17%	93.64%	78.47	15.30
17	210	209	1	99.52%	0.48%	3568	3361	207	16.17%	94.09%	77.92	16.24
18	210	210	0	100.00%	0.00%	3778	3571	207	17.18%	94.09%	76.91	17.25
19	210	210	0	100.00%	0.00%	3988	3781	207	18.20%	94.09%	75.90	18.27
20	210	208	2	99.05%	0.95%	4198	3989	209	19.20%	95.00%	75.80	19.09

Table 6.3 Test Results

To ensure our model would perform well on completely unseen data, we withheld the last 2 months of the year completely from model building. Our model still performed excellently on this out-of-time data with over 62.4% FDR at 3%.

OOT	# Records		# Goods		# Bads		Fraud Rate					
	12206	12027			179		0.01466491889					
Population Bin %	Bin Statistics						Cumulative Statistics					
	# Records	# Goods	# Bads	% Goods	% Bads	Total # Records	Cumulative Goods	Cumulative Bads	% Goods	% Bads (FDR)	KS	FPR
1	121	68	53	56.20%	43.80%	121	68	53	0.57%	29.61%	29.04	1.28
2	122	80	42	65.57%	34.43%	243	148	95	1.23%	53.07%	51.84	1.56
3	122	104	18	85.25%	14.75%	365	252	113	2.10%	63.13%	61.03	2.23
4	122	119	3	97.54%	2.46%	487	371	116	3.08%	64.80%	61.72	3.20
5	122	115	7	94.26%	5.74%	609	486	123	4.04%	68.72%	64.67	3.95
6	122	116	6	95.08%	4.92%	731	602	129	5.01%	72.07%	67.06	4.67
7	122	120	2	98.36%	1.64%	853	722	131	6.00%	73.18%	67.18	5.51
8	122	119	3	97.54%	2.46%	975	841	134	6.99%	74.86%	67.87	6.28
9	122	120	2	98.36%	1.64%	1097	961	136	7.99%	75.98%	67.99	7.07
10	122	121	1	99.18%	0.82%	1219	1082	137	9.00%	76.54%	67.54	7.90
11	122	121	1	99.18%	0.82%	1341	1203	138	10.00%	77.09%	67.09	8.72
12	122	119	3	97.54%	2.46%	1463	1322	141	10.99%	78.77%	67.78	9.38
13	122	122	0	100.00%	0.00%	1585	1444	141	12.01%	78.77%	66.76	10.24
14	122	117	5	95.90%	4.10%	1707	1561	146	12.98%	81.56%	68.59	10.69
15	122	121	1	99.18%	0.82%	1829	1682	147	13.99%	82.12%	68.14	11.44
16	122	120	2	98.36%	1.64%	1951	1802	149	14.98%	83.24%	68.26	12.09
17	123	123	0	100.00%	0.00%	2074	1925	149	16.01%	83.24%	67.23	12.92
18	122	122	0	100.00%	0.00%	2196	2047	149	17.02%	83.24%	66.22	13.74
19	122	120	2	98.36%	1.64%	2318	2167	151	18.02%	84.36%	66.34	14.35
20	122	121	1	99.18%	0.82%	2440	2288	152	19.02%	84.92%	65.89	15.05

Table 6.4 Out of Time Results

Fraud Scores Increasing with Activity: Merchant and Cardnum

We noted that as the number of transactions increased per day, our fraud algorithm flagged those transactions as fraudulent. Figure 6.1 shows how the fraud score for merchant number 4353000719908 and card number 5142187452 changed as the number of transactions per day increased.

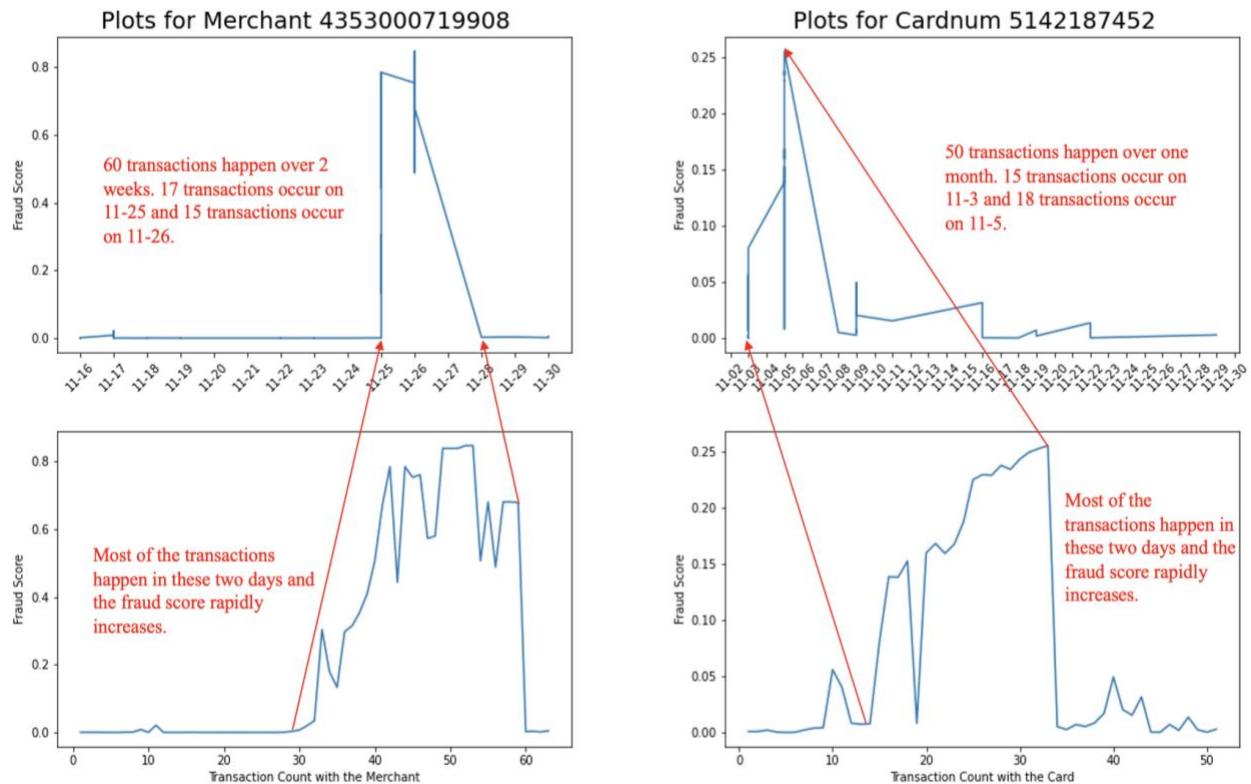


Figure 6.1: Fraud score increases with number of transactions by merchant and card number (Appendix)

Optimal FDR Cutoff

After selecting the final model, we tested different fraud detection rates to determine the optimal cutoff to maximize savings while denying as few transactions as possible. To calculate the maximum savings, we plotted the out of time population bins on the x-axis and the dollar savings on the y-axis. We found the optimal FDR rate at 5.9% where \$233,850 can be saved in the OOT population which leads to annualized savings of about \$1.4 million.

It is important to note that the savings at 3% FDR is \$215,100 (\$1.3 million annualized) which is about \$112,500 less than the 5.9% rate annually. Based on the business requirements, if the

importance of rejecting fewer transactions is higher than the cost savings, it could be beneficial to keep the FDR at 3%.



Figure 6.2: Graph showing the optimal FDR (at 5.9%) cutoff to maximize savings

Conclusions

Our project used a dataset of over 96,000 transactions to build a real-time model for finding transaction fraud. The original dataset contained various transaction information including the card number, merchant number, merchant state, merchant zip code, and purchase amount. Our first step was to fill in any missing merchant fields sourcing from other information in the dataset. Afterwards, we created attributes on different combinations of the transaction fields to build over 1,900 candidate variables focusing on purchase categories, the geographical location, and purchasing behavior through frequency, amount spent activity, and relative velocity variables.

After creating our candidate variables, we used a two-step feature selection process to reduce our collection of variables. First, we ran a filter method, selecting variables with the highest average rank of KS and FDR at 3%, to narrow our list of variables to 200. Next, we used a forward stepwise feature selection process, with a base logistic regression model, to get a well-ranked list of the 15 most important variables.

Using these 15 variables, we created 33 unique models from four different binary classification algorithms: Logistic Regression, Random Forest, XGBoost, and Neural Networks. For each iteration, we tested different sampling strategies and hyperparameters with successful results determined by the highest fraud detection rate on our out of time dataset. The best performing model used Random Forest, an ensemble algorithm, with SMOTE oversampling and the hyperparameters tuned to 50 estimators, a max depth of 10, and min samples split of 300. This final model produced a fraud detection rate of 63.13% at 3% of the population on the out of time data.

Given more time, we would have liked to create more candidate variables, specifically spending more time matching merchants from different branches to the same parent company and assigning purchases to more accurate industry categories. Another area of interest would be to purchase other third-party data, such as specific location data on both customers and merchants or specific industry categories for each merchant. Lastly, we would have liked to spend more time fine tuning our model's performance by training our model on different subsets containing the misclassified transactions. However, our model positively identified 72% of fraud at our optimal cutoff of 5.9% of the population resulting in an annualized saving of \$1.4 million and demonstrates a real business opportunity to utilize our algorithm as an effective way to stop transaction fraud in real-time.

Appendix

DATA QUALITY REPORT FOR CARD TRANSACTIONS DATA

Description

Dataset Name: Card Transactions Data

Dataset Purpose: A dataset of actual credit card purchases made by members of a US government organization. The fraudulent transactions in this dataset were assigned by an industry expert and assume no seasonality. The purpose of this dataset is to explore and identify credit card transaction fraud with only these ten transaction fields.

Data Source: card transactions.csv (US Government Organization)

Time Period: 2010-01-01 – 2010-12-31

Number of Fields: #10

Number of Records: 96,735

Summary Table

Numeric / Datetime Fields:

Field Name	Number of Records	Percent Populated	Unique Values	Mean	Standard Deviation	MIN Value	MAX Value	Most Common Field
Date	96,753	100.00%	365	N/A	N/A	2010-01-01	2010-12-31	2010-2-28
Amount	96,753	100.00%	34,909	427.89	10,006.14	0.01	3,102,045.53	3.62

Categorical Fields:

Field Name	Number of Records	Percent Populated	Number of Zeros	Unique Values	Most Common Field
Cardnum	96,753	100.00%	0	1,645	5142148452
Mechnum	93,378	96.51%	0	13,092	930090121224
Merch description	96,753	100.00%	0	13,126	GSA-FSS-ADV
Merch state	95,558	98.76%	0	228	TN
Merch zip	92,097	95.19%	0	4,568	38118
Transtype	96,753	100.00%	0	4	P
Fraud	96,753	100.00%	95,694	2	0

Data Field Exploration:

Field 1:

Name: Recnum

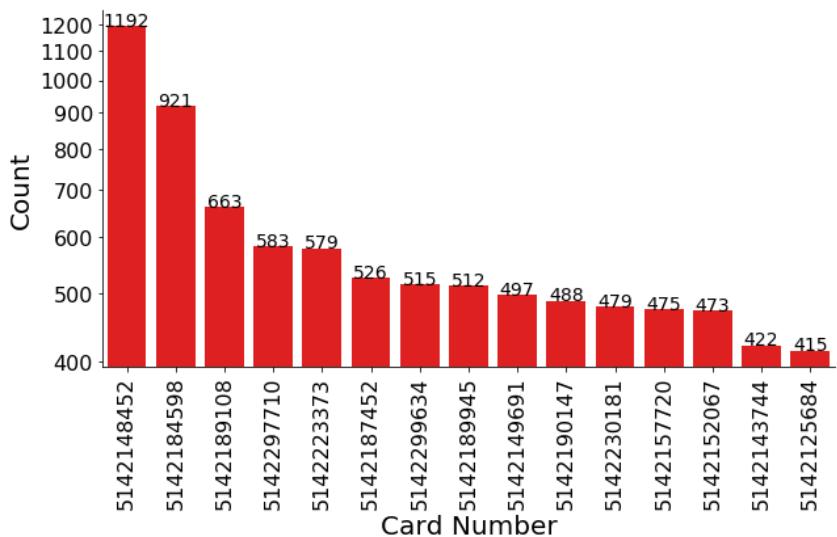
Description: Unique, time-ordered identifier for each transaction

Field 2:

Name: Cardnum

Description: Card number associated with transaction

Top 15 Most Frequent Card Numbers

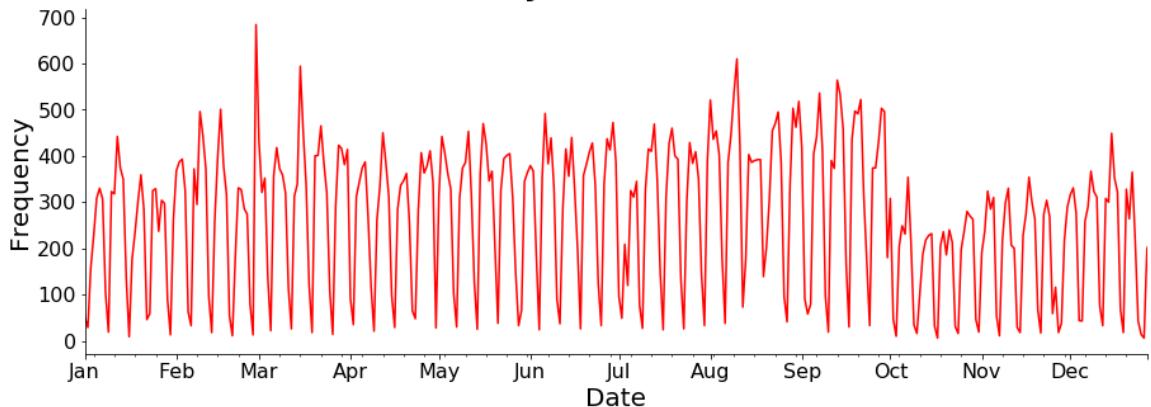


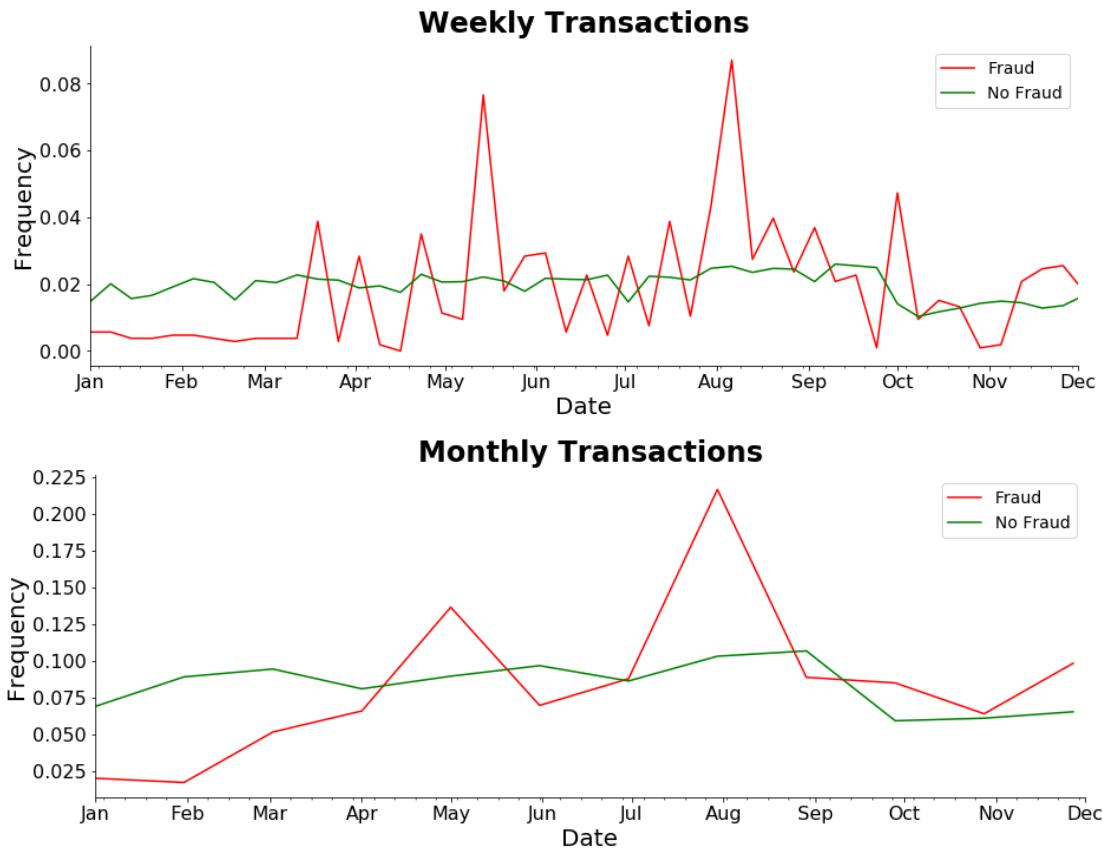
Field 3:

Name: Date

Description: Date of transaction

Daily Transactions



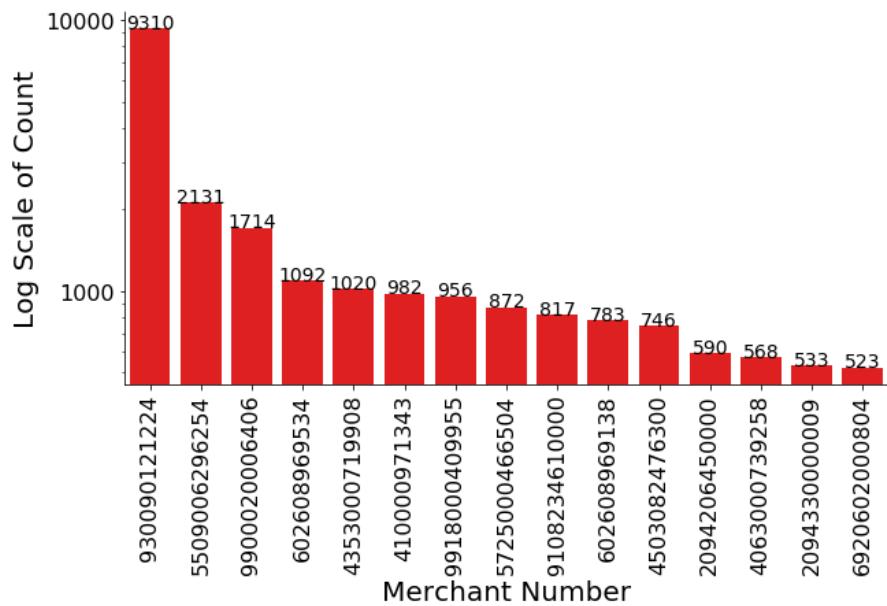


Field 4:

Name: Merchnum

Description: Unique identifier for merchant

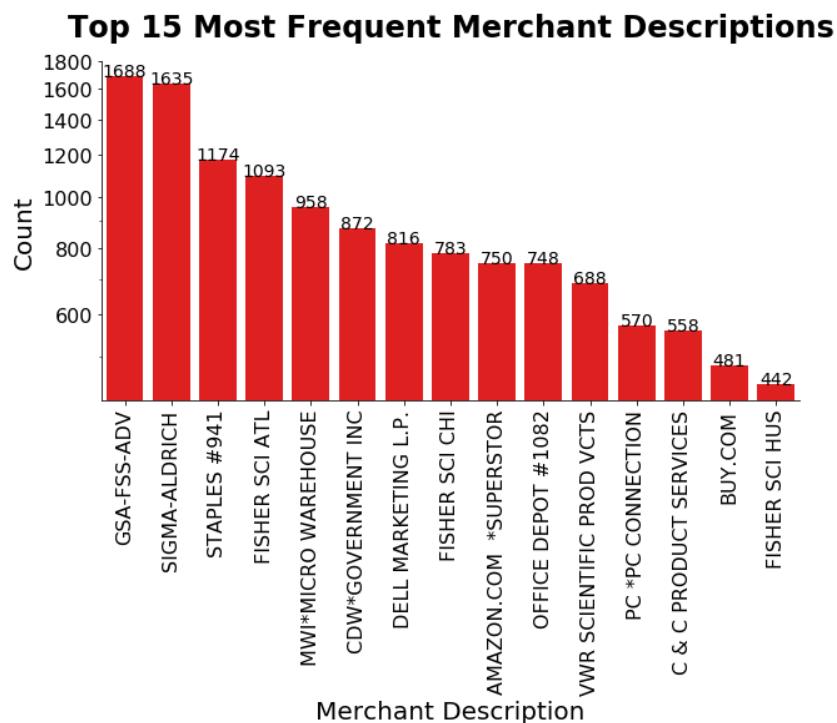
Top 15 Most Frequent Merchant Numbers



Field 5:

Name: Merch Description

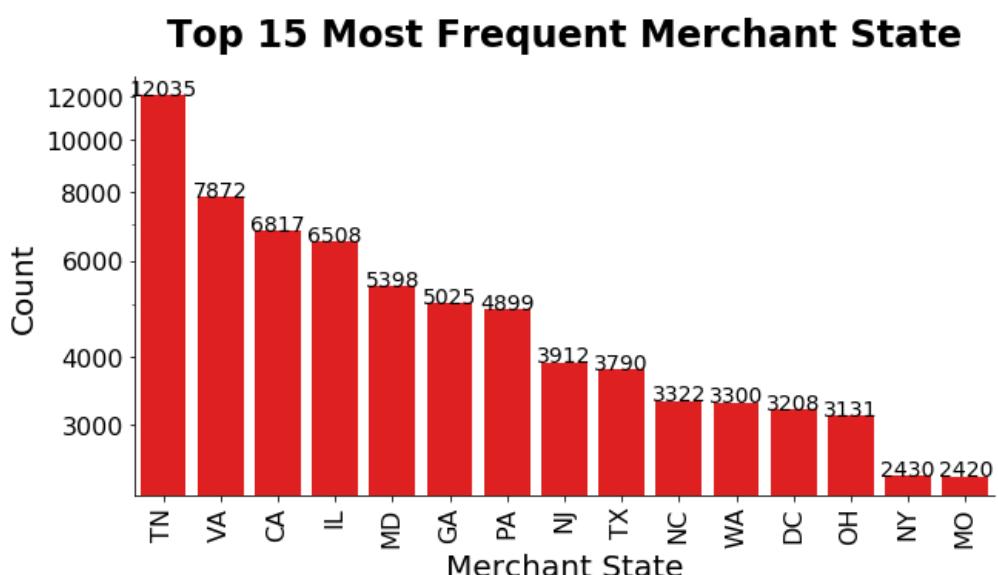
Description: Description of the merchant/vendor



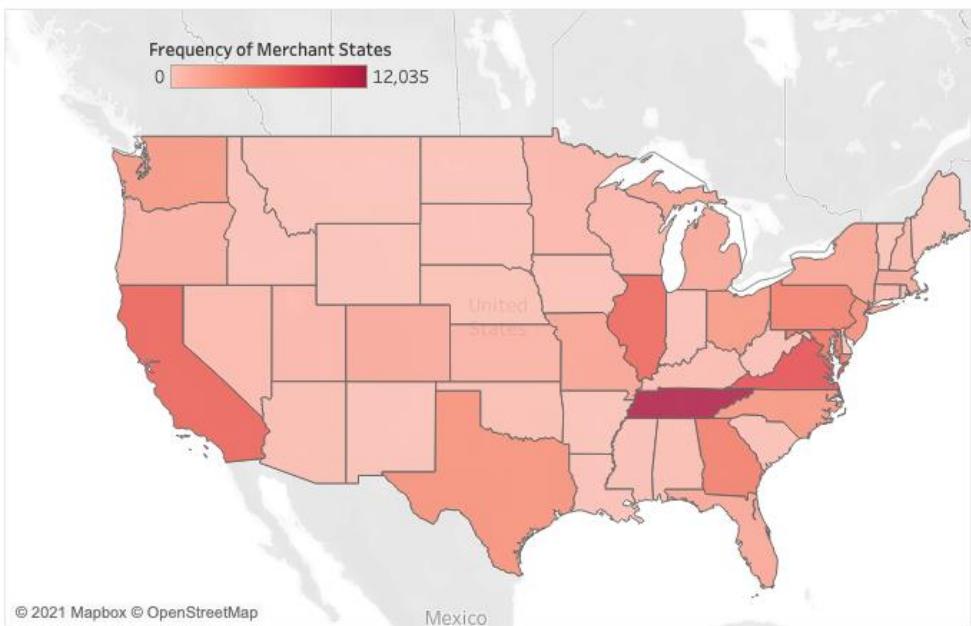
Field 6:

Name: Merch state

Description: State that merchant is located in



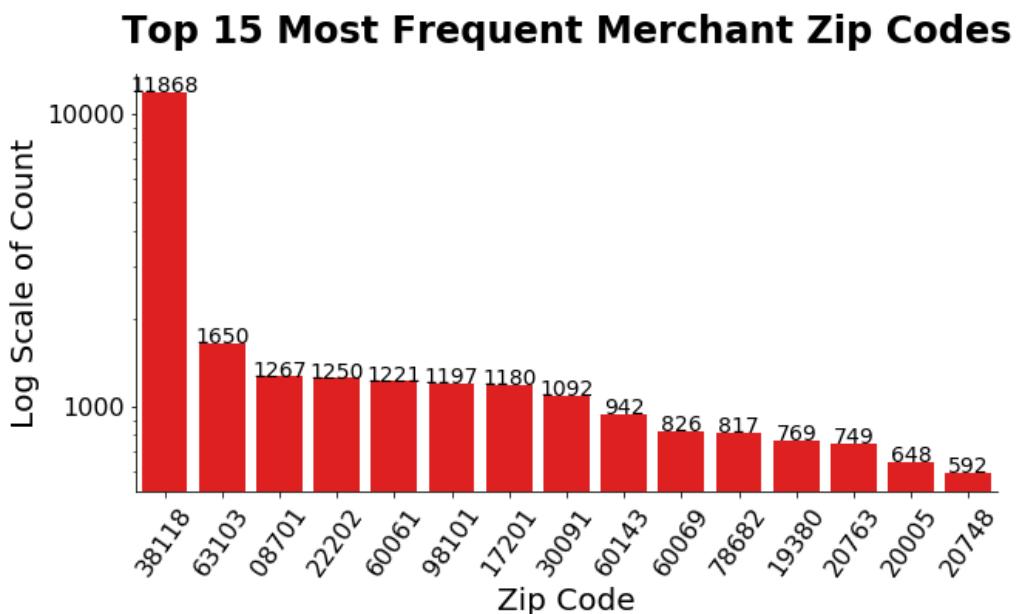
Heatmap of Most Frequent Merchant States



Field 7:

Name: Merch zip

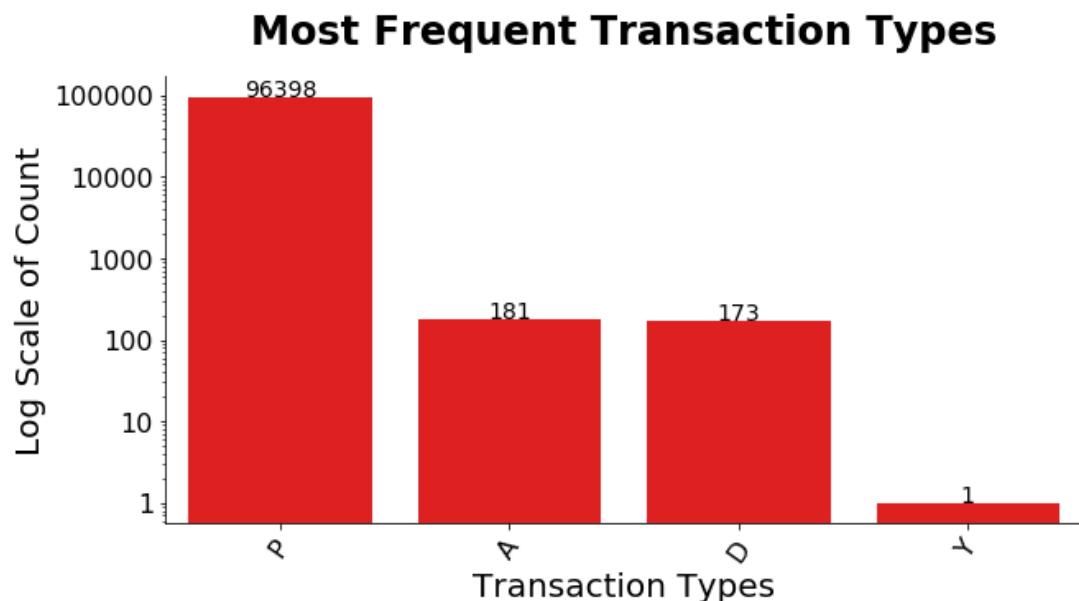
Description: The 5-digit zip code merchant is located in



Field 8:

Name: Transtype

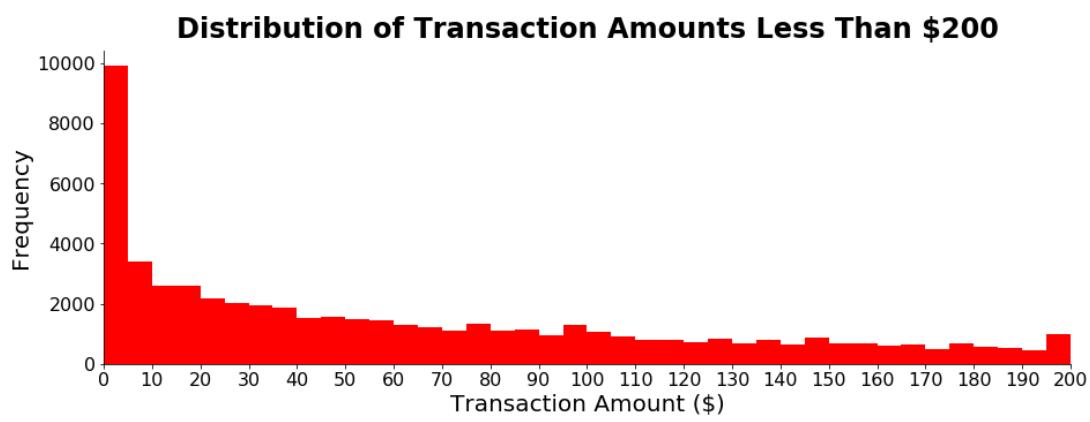
Description: Transaction Type, P refers to Purchase

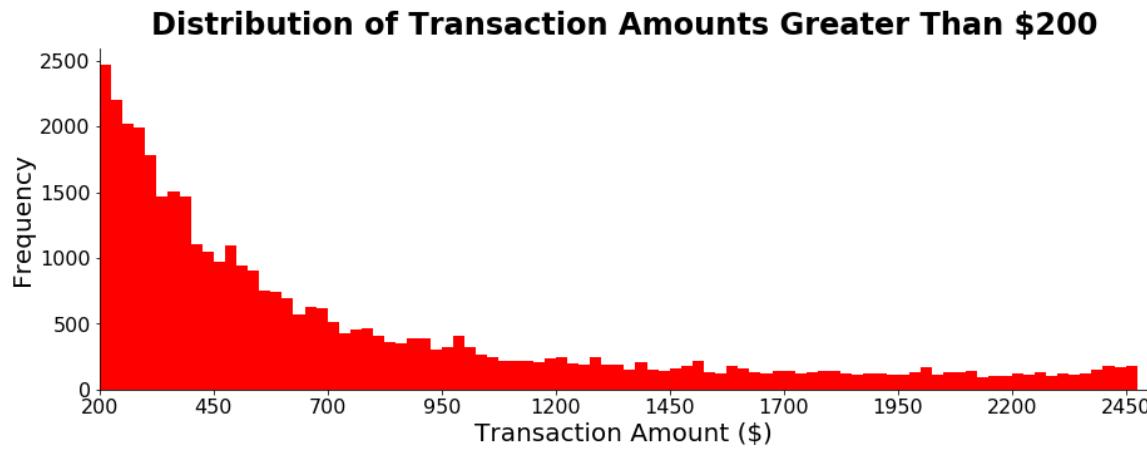


Field 9:

Name: Amount

Description: Total amount spent for that transaction





Field 10:

Name: Fraud

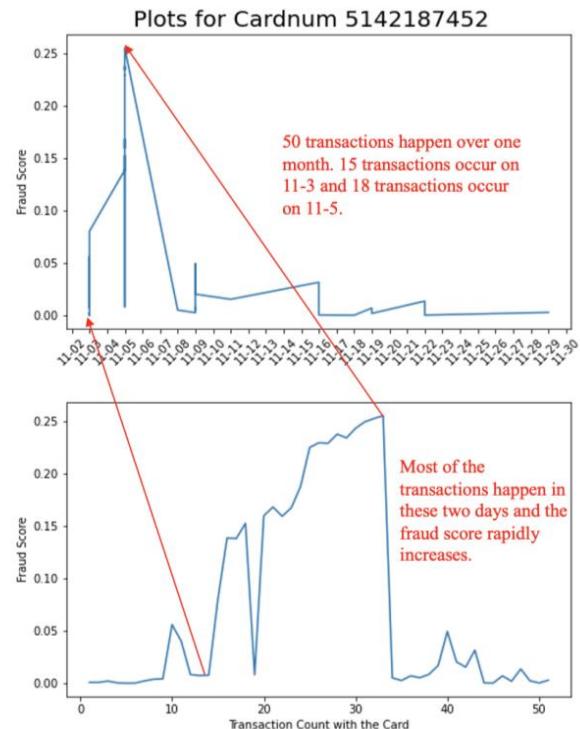
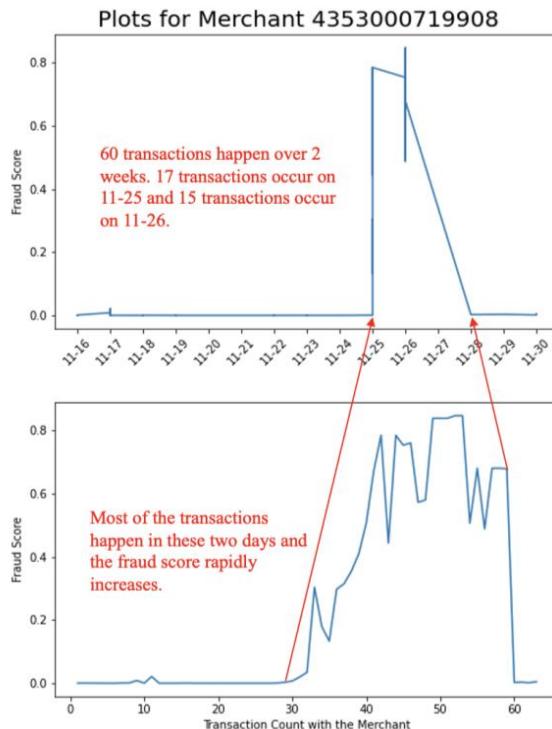
Description: A binary indicator representing if a transaction was marked as fraud. This dataset has approximately 1.09% of the transactions marked as fraud.



Model Hyperparameters Performance

Model	Parameters							Average FDR at 3%		
	Iteration	Sampling Strategy (Majority:Minority)	Penalty	C	Solver	Train	Test	OOT		
Logistic Regression	1	No Sampling	l2	1	lbfgs	31.73	31.23	15.25		
	2	No Sampling	l1	1	liblinear	65.18	65.04	37.21		
	3	Class Weighting (10:1)	l1	1	liblinear	65.20	63.86	38.99		
	4	SMOTE(70:30)	l1	0.1	liblinear	64.98	65.45	38.83		
	5	SMOTE(70:30)	l1	1	liblinear	65.62	63.75	37.43		
	6	SMOTE(30:70)	l2	0.1	liblinear	46.27	45.50	24.08		
	7	Class Weighting (10:1)	l1	1	saga	50.65	51.09	29.94		
	8	No Sampling	l2	1	liblinear	47.20	45.32	24.69		
	9	Class Weighting (10:1)	l1	0.1	liblinear	65.65	63.41	40.50		
XGBoost	1	No Sampling	0.1	100	max_depth	1	87.94	84.36	53.24	
	2	No Sampling	0.1	250	3	0.8	91.29	84.82	51.17	
	3	No Sampling	0.05	500	3	0.1	92.38	87.05	52.79	
	4	Class Weighting (10:1)	0.1	100	3	1	87.80	85.36	53.13	
	5	Class Weighting (10:1)	0.05	250	3	1	90.39	84.41	54.58	
	6	SMOTE (70:30)	0.1	100	3	1	87.32	83.18	53.07	
	7	SMOTE (70:30)	0.05	500	3	1	95.36	89.05	55.42	
	8	No Sampling	0.03	1000	3	1	96.15	89.64	55.75	
	9	UnderSampling (1:10)	0.1	100	3	1	87.98	83.86	52.57	
Random Forest	1	No Sampling	criterion	n_estimators	max_depth	min_samples_split	Train	Test	OOT	
	2	No Sampling	gini	100	15	200	96.98	84.68	63.41	
	3	No Sampling	gini	50	15	200	96.85	83.55	62.51	
	4	Class Weighting (10:1)	gini	50	10	300	85.06	79.73	61.34	
	5	Class Weighting (10:1)	entropy	50	10	300	86.48	81.59	57.99	
	6	SMOTE(70:30)	gini	50	10	300	88.85	80.41	49.33	
	7	SMOTE(70:30)	entropy	50	10	300	85.26	80.77	62.40	
	8	UnderSampling (20:80)	gini	100	15	300	93.36	83.09	58.32	
	9	SMOTE(70:30)	entropy	50	5	300	94.85	83.32	62.29	
Neural Networks	1	No Sampling	optimizer	layers	nodes	epochs	activation	Train	Test	OOT
	2	No Sampling	adam	2	20	10	sigmoid	65.56	66.27	30.84
	3	No Sampling	adam	2	16	15	sigmoid	66.26	64.77	31.51
	4	No Sampling	adam	2	16	15	relu	66.38	65.45	39.11
	5	No Sampling	adam	1	8	10	sigmoid	64.74	66.27	29.78
	6	SMOTE(70:30)	adam	2	20	15	relu	34.83	34.41	22.29

Fraud Scores



Candidate Variables

Note: This list is rank ordered by our filter method, meaning the most informative features are the ones with the lower index values

Index	Variable Name	Index	Variable Name
1	Amount_Cardnum_Merch_description_sum_7	50	Amount_Cardnum_Merch_description_max_365
2	Amount_Cardnum_Merch_description_sum_3	51	Amount_Cardnum_Merch_zip_max_180
3	Amount_Cardnum_Merch_zip_sum_7	52	Amount_Merchnum_max_0
4	Amount_Cardnum_Merch_zip_sum_3	53	Amount_Cardnum_Merch_zip_max_0
5	Amount_Cardnum_Merchnum_sum_7	54	Amount_Cardnum_Merch_state_max_0
6	Amount_Cardnum_Merch_description_sum_14	55	Amount_Cardnum_Merch_description_max_0
7	Amount_Cardnum_Merchnum_sum_3	56	Amount_Cardnum_Merch_zip_max_365
8	Amount_Cardnum_Merchnum_sum_14	57	Amount_Cardnum_sum_1
9	Amount_Cardnum_Merch_state_sum_3	58	Amount_Cardnum_Merchnum_max_0
10	Amount_Cardnum_Merch_zip_sum_14	59	Amount_Cardnum_Merchnum_sum_180
11	Amount_Cardnum_Merch_description_sum_1	60	Amount_Cardnum_sum_0
12	Amount_Cardnum_Merch_state_sum_1	61	Amount_Merchnum_sum_0
13	Amount_Cardnum_Merch_state_sum_7	62	Amount_Cardnum_Merchnum_sum_365
14	Amount_Cardnum_Merch_zip_sum_1	63	Amount_Cardnum_Merch_description_sum_180
15	Amount_Cardnum_Merchnum_sum_1	64	Amount_Cardnum_max_0
16	Amount_Cardnum_Merchnum_sum_30	65	Amount_Merchnum_sum_3
17	Amount_Cardnum_Merch_state_sum_14	66	Amount_Merchnum_sum_1
18	Amount_Cardnum_Merch_description_sum_30	67	Amount_Merchnum_max_1
19	Amount_Cardnum_Merch_zip_sum_30	68	Amount_Cardnum_Merch_zip_sum_180
20	Amount_Cardnum_Merch_zip_max_14	69	Amount_Cardnum_Industry_max_3
21	Amount_Cardnum_Merch_description_sum_0	70	Amount_Cardnum_max_7
22	Amount_Cardnum_Merch_description_max_14	71	Amount_Cardnum_Merch_description_sum_365
23	Amount_Cardnum_Merchnum_sum_0	72	Amount_Cardnum_max_1
24	Amount_Cardnum_Merch_state_sum_0	73	Amount_Cardnum_Industry_max_1
25	Amount_Cardnum_Merch_state_max_7	74	Amount_Cardnum_Merch_zip_mean_365
26	Amount_Cardnum_Merch_zip_max_3	75	Amount_Cardnum_Merch_zip_mean_180
27	Amount_Cardnum_Merch_zip_sum_0	76	Amount_Cardnum_max_3
28	Amount_Cardnum_Merch_zip_max_30	77	Amount_Merchnum_max_3
29	Amount_Cardnum_Merch_state_max_14	78	Amount_Cardnum_Merch_state_mean_3
30	Amount_Cardnum_Merchnum_max_14	79	Amount_Cardnum_mean_1
31	Amount_Cardnum_Merch_zip_max_7	80	Amount_Cardnum_Industry_max_0
32	Amount_Cardnum_Merch_description_max_30	81	Amount_Cardnum_Merch_zip_mean_30
33	Amount_Cardnum_Merch_description_max_3	82	Amount_Cardnum_Industry_mean_7
34	Amount_Cardnum_Merch_description_max_7	83	Amount_Cardnum_Merch_state_mean_7
35	Amount_Cardnum_Merchnum_max_3	84	Amount_Cardnum_mean_3
36	Amount_Cardnum_sum_3	85	Amount_Cardnum_Merch_zip_sum_365
37	Amount_Cardnum_Merchnum_max_30	86	Amount_Cardnum_sum_14
38	Amount_Cardnum_Merchnum_max_7	87	Amount_Cardnum_Industry_sum_0
39	Amount_Cardnum_Merch_state_max_3	88	Amount_Cardnum_Merch_state_mean_0
40	Amount_Cardnum_sum_7	89	Amount_Cardnum_max_14
41	Amount_Cardnum_Merch_zip_max_1	90	Amount_Cardnum_Merch_description_mean_0
42	Amount_Cardnum_Merch_description_max_1	91	Amount_Cardnum_Merch_zip_mean_3
43	Amount_Cardnum_Merchnum_max_1	92	Amount_Cardnum_Merchnum_mean_0
44	Amount_Cardnum_Merch_state_sum_30	93	Amount_Merchnum_mean_0
45	Amount_Cardnum_Merch_state_max_1	94	Amount_Cardnum_Industry_mean_3
46	Amount_Cardnum_Merch_state_max_30	95	Amount_Cardnum_Merch_state_mean_1
47	Amount_Cardnum_Merchnum_max_180	96	Amount_Cardnum_mean_0
48	Amount_Cardnum_Merch_description_max_180	97	Amount_Cardnum_Merch_zip_mean_0
49	Amount_Cardnum_Merchnum_max_365	98	Amount_Cardnum_Merch_zip_mean_7

Index	Variable Name	Index	Variable Name
99	Amount_Cardnum_Merchnum_mean_3	148	Amount_Cardnum_Merchnum_median_1
100	Amount_Cardnum_Merch_description_mean_3	149	Amount_Cardnum_Industry_median_3
101	Amount_Cardnum_Merchnum_mean_30	150	Amount_Cardnum_Merch_state_median_30
102	Amount_Cardnum_Merch_state_max_180	151	Amount_Merchnum_actual/median_365
103	Amount_Cardnum_Merch_state_mean_14	152	Amount_Cardnum_Merchnum_median_3
104	Amount_Cardnum_Merch_zip_mean_1	153	Amount_Cardnum_Merch_description_median_1
105	Amount_Cardnum_Merch_zip_mean_14	154	Amount_Cardnum_median_14
106	Amount_Cardnum_Merch_state_mean_30	155	Amount_Cardnum_Merch_description_median_3
107	Amount_Cardnum_Merch_description_mean_30	156	Amount_Cardnum_Merch_zip_median_1
108	Amount_Cardnum_Merch_description_mean_365	157	Amount_Merchnum_actual/median_180
109	Amount_Cardnum_Merchnum_mean_180	158	Amount_Cardnum_Industry_max_7
110	Amount_Cardnum_Merch_description_mean_1	159	Amount_Cardnum_Merchnum_median_30
111	Amount_Cardnum_Merchnum_mean_365	160	Amount_Cardnum_Merch_state_median_3
112	Amount_Cardnum_Merch_state_max_365	161	Amount_Cardnum_Merch_zip_median_365
113	Amount_Cardnum_Merch_description_mean_180	162	Amount_Cardnum_median_7
114	Amount_Cardnum_Merch_description_mean_7	163	Amount_Cardnum_Merch_state_median_7
115	Amount_Cardnum_Merchnum_mean_7	164	Amount_Cardnum_Industry_mean_180
116	Amount_Cardnum_Industry_mean_14	165	Amount_Cardnum_Merch_state_median_14
117	Amount_Cardnum_Merchnum_mean_14	166	Amount_Merchnum_mean_3
118	Amount_Cardnum_Merchnum_mean_1	167	Amount_Cardnum_Merchnum_median_14
119	Amount_Cardnum_Merch_description_mean_14	168	Amount_Cardnum_Merch_zip_median_180
120	Amount_Cardnum_mean_7	169	Amount_Cardnum_Merchnum_median_180
121	Amount_Cardnum_Industry_mean_0	170	Amount_Cardnum_Merch_zip_median_7
122	Amount_Cardnum_median_1	171	Amount_Cardnum_Merch_zip_median_30
123	Amount_Cardnum_Industry_mean_1	172	Amount_Cardnum_Merchnum_median_7
124	Amount_Cardnum_Merch_state_mean_365	173	Amount_Cardnum_Merch_description_median_7
125	Amount_Cardnum_mean_14	174	Amount_Merchnum_actual/mean_365
126	Amount_Merchnum_mean_1	175	Amount_Cardnum_median_30
127	Amount_Cardnum_Merch_state_mean_180	176	Amount_Cardnum_Industry_median_7
128	Amount_Merchnum_max_7	177	Amount_Cardnum_Merchnum_median_365
129	Amount_Cardnum_Industry_sum_1	178	Amount_Merchnum_sum_7
130	Amount_Cardnum_Industry_mean_30	179	Amount_Cardnum_Industry_median_30
131	Amount_Cardnum_Merchnum_median_0	180	Amount_Cardnum_Industry_mean_365
132	Amount_Cardnum_mean_30	181	Amount_Cardnum_Merch_state_median_180
133	Amount_Cardnum_Merch_state_median_0	182	Amount_Cardnum_Merch_zip_median_14
134	Amount_Cardnum_median_0	183	Amount_Cardnum_Merch_description_median_365
135	Amount_Cardnum_median_3	184	Amount_Cardnum_Merch_description_median_30
136	Amount_Cardnum_Industry_median_0	185	Amount_Cardnum_Merch_description_median_180
137	Amount_Cardnum_Merch_description_median_0	186	Amount_Merchnum_median_0
138	Amount_Cardnum_max_30	187	Amount_Cardnum_Merch_description_median_14
139	Amount_Cardnum_Merch_zip_median_0	188	Amount_Cardnum_Merch_state_median_365
140	Amount_Cardnum_sum_30	189	Amount_Cardnum_Industry_median_14
141	Amount	190	Amount_Merchnum_actual/mean_180
142	Amount_Cardnum_Industry_sum_3	191	Amount_Merchnum_mean_7
143	Amount_Cardnum_max_180	192	Amount_Merchnum_median_1
144	Amount_Cardnum_max_365	193	Amount_Merchnum_mean_14
145	Amount_Cardnum_Merch_state_median_1	194	Amount_Cardnum_Merch_state_sum_180
146	Amount_Cardnum_Industry_median_1	195	Amount_Merchnum_max_14
147	Amount_Cardnum_Merch_zip_median_3	196	Amount_Merchnum_median_3

Index	Variable Name	Index	Variable Name
197	Amount_Cardnum_Merch state_sum_365	246	OriginalMostIndDistance_Cardnum_Merchnum_count_1
198	Amount_Merchnum_mean_30	247	OriginalMostDistance_Cardnum_Merch zip_count_1
199	Amount_Merchnum_median_7	248	Amount_Cardnum_Merch zip_count_1
200	Amount_Cardnum_Industry_median_180	249	OriginalMostIndDistance_Cardnum_Merch zip_count_1
201	Amount_Merchnum_max_30	250	Amount_Merchnum_actual/mean_7
202	Amount_Cardnum_Industry_median_365	251	Amount_Merchnum_actual/median_14
203	Amount_Cardnum_mean_180	252	Amount_Cardnum_Merch_description_count_1
204	Amount_Merchnum_median_14	253	OriginalMostDistance_Cardnum_Merch_description_count_1
205	Amount_Cardnum_mean_365	254	OriginalMostIndDistance_Cardnum_Merch_description_count_1
206	Amount_Cardnum_count_1	255	Amount_Merchnum_median_180
207	OriginalMostIndDistance_Cardnum_count_1	256	OriginalMostIndDistance_Cardnum_Merch zip_count_3
208	OriginalMostDistance_Cardnum_count_1	257	Amount_Cardnum_Merch zip_count_3
209	Amount_Merchnum_median_30	258	OriginalMostDistance_Cardnum_Merch zip_count_3
210	Amount_Cardnum_actual/mean_365	259	Amount_Cardnum_Merchnum_actual/sum_1
211	Amount_Cardnum_count_3	260	Amount_Cardnum_Merch zip_actual/sum_1
212	Amount_Cardnum_actual/median_365	261	Amount_Cardnum_Merch_description_actual/sum_1
213	OriginalMostIndDistance_Cardnum_count_3	262	Amount_Cardnum_sum_365
214	OriginalMostDistance_Cardnum_count_3	263	Amount_Merchnum_actual/median_7
215	Amount_Cardnum_actual/median_180	264	Amount_Cardnum_Merchnum_actual/sum_3
216	Amount_Merchnum_actual/mean_30	265	Amount_Merchnum_median_365
217	Amount_Cardnum_actual/mean_180	266	Amount_Cardnum_count_7
218	Amount_Merchnum_sum_14	267	OriginalMostIndDistance_Cardnum_count_7
219	Amount_Cardnum_Industry_max_14	268	OriginalMostDistance_Cardnum_count_7
220	Amount_Merchnum_actual/median_30	269	Amount_Cardnum_Merchnum_day_since_
221	Amount_Merchnum_mean_180	270	OriginalMostIndDistance_Cardnum_Merchnum_day_since_
222	Amount_Merchnum_mean_365	271	OriginalMostDistance_Cardnum_Merchnum_day_since_
223	OriginalMostIndDistance_Cardnum_Merch state_count_1	272	Amount_Cardnum_Industry_sum_7
224	OriginalMostDistance_Cardnum_Merch state_count_1	273	Amount_Cardnum_actual/mean_30
225	Amount_Cardnum_Merch state_count_1	274	Amount_Cardnum_Merch zip_actual/sum_3
226	Amount_Cardnum_sum_180	275	Amount_Cardnum_Merch_description_actual/sum_3
227	Amount_Merchnum_actual/mean_14	276	Amount_Cardnum_actual/max_365
228	Amount_Cardnum_Merch state_count_3	277	Amount_Cardnum_Industry_actual/mean_365
229	OriginalMostDistance_Cardnum_Merch state_count_3	278	Amount_Merchnum_actual/mean_3
230	OriginalMostIndDistance_Cardnum_Merch state_count_3	279	Amount_Cardnum_median_365
231	Amount_Merchnum_max_365	280	Amount_Cardnum_median_180
232	OriginalMostDistance_Cardnum_count_0	281	Amount_Cardnum_Merch state_actual/sum_3
233	Amount_Cardnum_count_0	282	Amount_Cardnum_actual/median_30
234	OriginalMostIndDistance_Cardnum_count_0	283	OriginalMostDistance_Cardnum_Merch state_count_0
235	Amount_Merchnum_max_180	284	Amount_Cardnum_Merch state_count_0
236	Amount_Cardnum_Merch state_actual/sum_1	285	OriginalMostIndDistance_Cardnum_Merch state_count_0
237	Amount_Cardnum_Industry_max_30	286	Amount_Cardnum_Industry_actual/mean_180
238	Amount_Cardnum_Merchnum_count_3	287	Amount_Cardnum_Merchnum_actual/max_1
239	OriginalMostDistance_Cardnum_Merchnum_count_3	288	Amount_Cardnum_Merch zip_actual/max_1
240	OriginalMostIndDistance_Cardnum_Merchnum_count_3	289	Amount_Cardnum_day_since_
241	OriginalMostDistance_Cardnum_Merch_description_count_3	290	OriginalMostDistance_Cardnum_day_since_
242	OriginalMostIndDistance_Cardnum_Merch_description_count_3	291	OriginalMostIndDistance_Cardnum_day_since_
243	Amount_Cardnum_Merch_description_count_3	292	Amount_Cardnum_Merch state_actual/sum_0
244	OriginalMostDistance_Cardnum_Merchnum_count_1	293	Amount_Cardnum_Merch_description_actual/max_1
245	Amount_Cardnum_Merchnum_count_1	294	OriginalMostIndDistance_Cardnum_Merchnum_count_0

Index	Variable Name	Index	Variable Name
295	Amount_Cardnum_Merchnum_count_0	344	Amount_Cardnum_Merch state_count_3_by_180
296	OriginalMostDistance_Cardnum_Merchnum_count_0	345	OriginalMostDistance_Cardnum_Merch state_count_3_by_180
297	Amount_Cardnum_Merchnum_actual/sum_0	346	Amount_Cardnum_Merchnum_actual/sum_7
298	Amount_Cardnum_Merch state_count_1_by_365	347	OriginalMostIndDistance_Cardnum_count_1_by_365
299	OriginalMostIndDistance_Cardnum_Merch state_count_1_by_365	348	Amount_Cardnum_count_1_by_365
300	OriginalMostDistance_Cardnum_Merch state_count_1_by_365	349	OriginalMostDistance_Cardnum_count_1_by_365
301	OriginalMostDistance_Cardnum_Merch_description_count_0	350	Amount_Cardnum_Merchnum_actual/max_0
302	Amount_Cardnum_Merchnum_actual/max_3	351	Amount_Cardnum_actual/median_14
303	OriginalMostIndDistance_Cardnum_Merch_description_count_0	352	Amount_Cardnum_Merch state_actual/median_365
304	Amount_Cardnum_Merch_description_count_0	353	OriginalMostIndDistance_Cardnum_Merch_description_count_3_by_180
305	Amount_Cardnum_Merch zip_count_0	354	Amount_Cardnum_Merch_description_count_3_by_180
306	OriginalMostDistance_Cardnum_Merch zip_count_0	355	OriginalMostDistance_Cardnum_Merch_description_count_3_by_180
307	OriginalMostIndDistance_Cardnum_Merch zip_count_0	356	Amount_Cardnum_Merch zip_actual/max_0
308	Amount_Cardnum_Merch state_count_0_by_3	357	Amount_Cardnum_Merch_description_actual/max_0
309	OriginalMostDistance_Cardnum_Merch state_count_0_by_3	358	OriginalMostIndDistance_Cardnum_Industry_count_3_by_30
310	OriginalMostIndDistance_Cardnum_Merch state_count_0_by_3	359	OriginalMostDistance_Cardnum_Industry_count_3_by_30
311	Amount_Cardnum_Merch_description_actual/sum_0	360	Amount_Cardnum_Industry_count_3_by_30
312	OriginalMostIndDistance_Cardnum_Merch_description_day_since_	361	OriginalMostDistance_Cardnum_Merch_description_count_1_by_365
313	Amount_Cardnum_Merch_description_day_since_	362	Amount_Cardnum_Merch_description_count_1_by_365
314	OriginalMostDistance_Cardnum_Merch_description_day_since_	363	OriginalMostIndDistance_Cardnum_Merch_description_count_1_by_365
315	Amount_Cardnum_Merch zip_actual/sum_0	364	Amount_Cardnum_actual/max_30
316	Amount_Merchnum_sum_30	365	Amount_Cardnum_actual/max_180
317	Amount_Cardnum_Merch zip_actual/max_3	366	Amount_Cardnum_Merch state_actual/max_0
318	Amount_Cardnum_Merch state_actual/max_1	367	Amount_Merchnum_day_since_
319	Amount_Cardnum_Merch_description_actual/max_3	368	OriginalMostIndDistance_Merchnum_day_since_
320	Amount_Merchnum_actual/median_3	369	OriginalMostDistance_Merchnum_day_since_
321	OriginalMostDistance_Cardnum_Merchnum_count_0_by_3	370	Amount_Cardnum_Merch state_actual/median_180
322	Amount_Cardnum_Merchnum_count_0_by_3	371	OriginalMostDistance_Cardnum_Industry_day_since_
323	OriginalMostIndDistance_Cardnum_Merchnum_count_0_by_3	372	Amount_Cardnum_Industry_day_since_
324	OriginalMostDistance_Cardnum_Merch zip_count_3_by_365	373	OriginalMostIndDistance_Cardnum_Industry_day_since_
325	OriginalMostIndDistance_Cardnum_Merch zip_count_3_by_365	374	Amount_Cardnum_Merchnum_actual/max_7
326	Amount_Cardnum_Merch zip_count_3_by_365	375	OriginalMostIndDistance_Cardnum_Merch_description_count_1_by_180
327	Amount_Cardnum_Merch zip_count_0_by_3	376	OriginalMostDistance_Cardnum_Merch_description_count_1_by_180
328	OriginalMostIndDistance_Cardnum_Merch zip_count_0_by_3	377	Amount_Cardnum_Merch_description_count_1_by_180
329	OriginalMostDistance_Cardnum_Merch zip_count_0_by_3	378	OriginalMostDistance_Cardnum_Merchnum_count_7
330	OriginalMostDistance_Cardnum_Merch_description_count_0_by_3	379	Amount_Cardnum_Merchnum_count_7
331	Amount_Cardnum_Merch_description_count_0_by_3	380	OriginalMostIndDistance_Cardnum_Merchnum_count_7
332	OriginalMostIndDistance_Cardnum_Merch_description_count_0_by_3	381	OriginalMostDistance_Cardnum_Merch state_day_since_
333	Amount_Cardnum_Industry_actual/median_365	382	OriginalMostIndDistance_Cardnum_Merch state_day_since_
334	Amount_Cardnum_Merch state_actual/mean_365	383	Amount_Cardnum_Merch state_day_since_
335	Amount_Cardnum_actual/mean_14	384	Amount_Cardnum_actual/median_7
336	Amount_Cardnum_Merch state_actual/mean_180	385	Amount_Merchnum_actual/max_180
337	Amount_Cardnum_Industry_actual/median_180	386	Amount_Cardnum_Merch state_actual/max_3
338	OriginalMostDistance_Cardnum_count_1_by_180	387	Amount_Cardnum_Merchnum_actual/median_7
339	OriginalMostIndDistance_Cardnum_count_1_by_180	388	Amount_Cardnum_Merch_description_actual/sum_7
340	Amount_Cardnum_count_1_by_180	389	OriginalMostDistance_Cardnum_Merch_description_count_3_by_365
341	Amount_Merchnum_actual/mean_1	390	OriginalMostIndDistance_Cardnum_Merch_description_count_3_by_365
342	Amount_Cardnum_actual/mean_7	391	Amount_Cardnum_Merch_description_count_3_by_365
343	OriginalMostIndDistance_Cardnum_Merch state_count_3_by_180	392	Amount_Cardnum_Merch zip_actual/median_7

Index	Variable Name	Index	Variable Name
393	Amount_Cardnum_Merch_description_actual/median_7	442	Amount_Cardnum_Merch_state_actual/mean_30
394	Amount_Cardnum_Merch_zip_actual/sum_7	443	Amount_Cardnum_Industry_max_180
395	Amount_Cardnum_Merch_zip_count_1_by_365	444	Amount_Cardnum_Merchnum_actual/mean_1
396	OriginalMostIndDistance_Cardnum_Merch_zip_count_1_by_365	445	Amount_Cardnum_Industry_actual/mean_14
397	OriginalMostDistance_Cardnum_Merch_zip_count_1_by_365	446	Amount_Cardnum_Industry_max_365
398	Amount_Cardnum_Merch_zip_actual/max_7	447	Amount_Cardnum_Merch_description_actual/median_3
399	OriginalMostIndDistance_Cardnum_Merch_state_count_1_by_180	448	Amount_Cardnum_Merch_description_actual/median_14
400	Amount_Cardnum_Merch_state_count_1_by_180	449	Amount_Cardnum_Merch_zip_actual/median_3
401	OriginalMostDistance_Cardnum_Merch_state_count_1_by_180	450	Amount_Cardnum_count_3_by_180
402	Amount_Merchnum_actual/median_1	451	OriginalMostIndDistance_Cardnum_count_3_by_180
403	OriginalMostDistance_Cardnum_Merch_state_count_7	452	OriginalMostDistance_Cardnum_count_3_by_180
404	Amount_Cardnum_Merch_state_count_7	453	Amount_Cardnum_Merch_state_actual/median_7
405	OriginalMostIndDistance_Cardnum_Merch_state_count_7	454	OriginalMostDistance_Cardnum_Merch_description_count_7
406	Amount_Cardnum_Merchnum_count_0_by_7	455	Amount_Cardnum_Merch_description_count_7
407	OriginalMostDistance_Cardnum_Merchnum_count_0_by_7	456	OriginalMostIndDistance_Cardnum_Merch_description_count_7
408	OriginalMostIndDistance_Cardnum_Merchnum_count_0_by_7	457	Amount_Cardnum_Merchnum_actual/mean_3
409	Amount_Cardnum_count_1_by_30	458	Amount_Cardnum_Merch_state_actual/mean_14
410	OriginalMostDistance_Cardnum_count_1_by_30	459	Amount_Cardnum_Merchnum_actual/mean_365
411	OriginalMostIndDistance_Cardnum_count_1_by_30	460	Amount_Cardnum_Merch_zip_actual/mean_1
412	Amount_Cardnum_Merch_description_count_0_by_7	461	Amount_Cardnum_Industry_actual/median_30
413	OriginalMostIndDistance_Cardnum_Merch_description_count_0_by_7	462	OriginalMostIndDistance_Cardnum_Merch_zip_count_7
414	OriginalMostDistance_Cardnum_Merch_description_count_0_by_7	463	OriginalMostDistance_Cardnum_Merch_zip_count_7
415	Amount_Cardnum_Merchnum_actual/median_14	464	Amount_Cardnum_Merch_zip_count_7
416	Amount_Cardnum_Industry_actual/mean_30	465	Amount_Cardnum_Merch_state_actual/median_1
417	Amount_Cardnum_Merchnum_actual/median_1	466	OriginalMostIndDistance_Cardnum_Merchnum_count_3_by_180
418	Amount_Cardnum_Merch_state_count_0_by_7	467	Amount_Cardnum_Merchnum_count_3_by_180
419	OriginalMostIndDistance_Cardnum_Merch_state_count_0_by_7	468	OriginalMostDistance_Cardnum_Merchnum_count_3_by_180
420	OriginalMostDistance_Cardnum_Merch_state_count_0_by_7	469	Amount_Cardnum_Merchnum_actual/mean_0
421	Amount_Cardnum_Merch_description_actual/max_7	470	Amount_Cardnum_Industry_actual/median_7
422	Amount_Cardnum_Merchnum_actual/median_3	471	Amount_Cardnum_Merchnum_actual/mean_7
423	Amount_Cardnum_Merch_description_actual/median_1	472	Amount_Cardnum_Merch_state_actual/mean_7
424	OriginalMostIndDistance_Cardnum_Merch_zip_count_0_by_7	473	Amount_Cardnum_Merchnum_actual/mean_180
425	OriginalMostDistance_Cardnum_Merch_zip_count_0_by_7	474	Amount_Cardnum_actual/sum_365
426	Amount_Cardnum_Merch_zip_count_0_by_7	475	Amount_Cardnum_Merch_description_actual/mean_7
427	Amount_Cardnum_Merch_state_actual/median_3	476	Amount_Cardnum_Merch_state_actual/mean_3
428	Amount_Cardnum_Merch_zip_count_1_by_180	477	OriginalMostDistance_Cardnum_Merchnum_count_1_by_365
429	OriginalMostDistance_Cardnum_Merch_zip_count_1_by_180	478	Amount_Cardnum_Merchnum_count_1_by_365
430	OriginalMostIndDistance_Cardnum_Merch_zip_count_1_by_180	479	OriginalMostIndDistance_Cardnum_Merchnum_count_1_by_365
431	Amount_Cardnum_actual/sum_0	480	OriginalMostDistance_Cardnum_count_1_by_14
432	Amount_Cardnum_Merch_zip_actual/median_1	481	Amount_Cardnum_count_1_by_14
433	OriginalMostIndDistance_Cardnum_count_3_by_30	482	OriginalMostIndDistance_Cardnum_count_1_by_14
434	Amount_Cardnum_count_3_by_30	483	Amount_Cardnum_Merchnum_actual/mean_14
435	OriginalMostDistance_Cardnum_count_3_by_30	484	Amount_Cardnum_Merch_description_actual/mean_1
436	Amount_Cardnum_Industry_sum_14	485	OriginalMostDistance_Cardnum_Industry_count_0
437	OriginalMostIndDistance_Cardnum_Merch_state_count_3_by_30	486	Amount_Cardnum_Industry_count_0
438	Amount_Cardnum_Merch_state_count_3_by_30	487	OriginalMostIndDistance_Cardnum_Industry_count_0
439	OriginalMostDistance_Cardnum_Merch_state_count_3_by_30	488	Amount_Cardnum_Industry_actual/mean_7
440	Amount_Merchnum_actual/max_365	489	Amount_Cardnum_Merch_zip_actual/median_14
441	Amount_Cardnum_Merch_state_actual/sum_7	490	Amount_Cardnum_Merchnum_actual/sum_14

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491	Amount_Cardnum_Merchnum_actual/median_0	540	OriginalMostIndDistance_Cardnum_Merch state_count_3_by_365
492	Amount_Cardnum_Merch zip_actual/mean_0	541	Amount_Cardnum_Merch state_actual/median_0
493	Amount_Cardnum_Merch_description_actual/mean_365	542	Amount_Cardnum_Merch_description_actual/median_180
494	Amount_Cardnum_Merch state_actual/mean_1	543	Amount_Cardnum_Industry_actual/median_14
495	Amount_Cardnum_Merch_description_actual/mean_3	544	Amount_Cardnum_Merch_description_actual/mean_30
496	Amount_Cardnum_Merch_description_actual/mean_14	545	Amount_Merchnum_actual/median_0
497	Amount_Cardnum_Merch zip_actual/mean_3	546	Amount_Cardnum_actual/median_3
498	Amount_Cardnum_Industry_count_3_by_180	547	Amount_Cardnum_Merch zip_actual/median_365
499	OriginalMostDistance_Cardnum_Industry_count_3_by_180	548	Amount_Cardnum_Merch zip_actual/median_180
500	OriginalMostIndDistance_Cardnum_Industry_count_3_by_180	549	Amount_Cardnum_actual/median_0
501	Amount_Cardnum_Merch_description_actual/mean_180	550	Amount_Cardnum_Merch zip_actual/mean_30
502	Amount_Cardnum_Merchnum_actual/median_365	551	Amount_Cardnum_Merch_description_actual/median_30
503	Amount_Cardnum_Merch zip_actual/mean_7	552	Amount_Cardnum_Merchnum_count_3_by_365
504	OriginalMostDistance_Cardnum_count_0_by_3	553	OriginalMostIndDistance_Cardnum_Merchnum_count_3_by_365
505	Amount_Cardnum_count_0_by_3	554	OriginalMostDistance_Cardnum_Merchnum_count_3_by_365
506	OriginalMostIndDistance_Cardnum_count_0_by_3	555	Amount_Cardnum_actual/sum_1
507	Amount_Cardnum_actual/sum_180	556	Amount_Cardnum_Industry_actual/max_180
508	Amount_Merchnum_actual/mean_0	557	Amount_Cardnum_Industry_actual/median_3
509	Amount_Cardnum_Merch_description_actual/mean_0	558	Amount_Cardnum_Merch_description_actual/sum_14
510	Amount_Cardnum_Merch state_actual/median_14	559	Amount_Cardnum_Industry_count_14
511	Amount_Cardnum_actual/mean_3	560	OriginalMostIndDistance_Cardnum_Industry_count_14
512	Amount_Cardnum_Merch zip_actual/mean_365	561	OriginalMostDistance_Cardnum_Industry_count_14
513	Amount_Cardnum_Merchnum_actual/median_30	562	Amount_Cardnum_Merchnum_count_0_by_14
514	Amount_Cardnum_Merchnum_actual/median_180	563	OriginalMostIndDistance_Cardnum_Merchnum_count_0_by_14
515	Amount_Cardnum_Merch state_actual/max_180	564	OriginalMostDistance_Cardnum_Merchnum_count_0_by_14
516	Amount_Cardnum_Merch zip_actual/mean_14	565	OriginalMostIndDistance_Cardnum_count_3_by_14
517	Amount_Cardnum_Merch zip_actual/mean_180	566	OriginalMostDistance_Cardnum_count_3_by_14
518	Amount_Cardnum_Merch state_actual/mean_0	567	Amount_Cardnum_count_3_by_14
519	Amount_Merchnum_sum_180	568	Amount_Cardnum_Merch state_actual/max_7
520	Amount_Cardnum_Merch zip_actual/median_0	569	Amount_Cardnum_Industry_actual/mean_3
521	Amount_Cardnum_Merchnum_actual/mean_30	570	Amount_Cardnum_Merch zip_count_1_by_30
522	OriginalMostIndDistance_Cardnum_Merchnum_count_1_by_180	571	OriginalMostDistance_Cardnum_Merch zip_count_1_by_30
523	Amount_Cardnum_Merchnum_count_1_by_180	572	OriginalMostIndDistance_Cardnum_Merch zip_count_1_by_30
524	OriginalMostDistance_Cardnum_Merchnum_count_1_by_180	573	Amount_Cardnum_Industry_actual/mean_1
525	OriginalMostIndDistance_Cardnum_Merch zip_count_3_by_180	574	Amount_Cardnum_Merch zip_actual/sum_14
526	Amount_Cardnum_Merch zip_count_3_by_180	575	Amount_Cardnum_actual/mean_1
527	OriginalMostDistance_Cardnum_Merch zip_count_3_by_180	576	Amount_Cardnum_Merch zip_count_180
528	OriginalMostDistance_Cardnum_Merch state_count_1_by_30	577	OriginalMostDistance_Cardnum_Merch zip_count_180
529	Amount_Cardnum_Merch state_count_1_by_30	578	OriginalMostIndDistance_Cardnum_Merch zip_count_180
530	OriginalMostIndDistance_Cardnum_Merch state_count_1_by_30	579	Amount_Cardnum_Merch zip_actual/max_14
531	Amount_Cardnum_Merch_description_actual/median_0	580	OriginalMostIndDistance_Cardnum_Industry_count_1_by_14
532	Amount_Cardnum_Merch state_actual/median_30	581	Amount_Cardnum_Industry_count_1_by_14
533	Amount_Cardnum_count_3_by_365	582	OriginalMostDistance_Cardnum_Industry_count_1_by_14
534	OriginalMostDistance_Cardnum_count_3_by_365	583	OriginalMostIndDistance_Merchnum_count_3_by_30
535	OriginalMostIndDistance_Cardnum_count_3_by_365	584	OriginalMostDistance_Merchnum_count_3_by_30
536	Amount_Cardnum_Merchnum_actual/max_14	585	Amount_Merchnum_count_3_by_30
537	Amount_Cardnum_Merch_description_actual/median_365	586	OriginalMostIndDistance_Cardnum_actual/mean_180
538	OriginalMostDistance_Cardnum_Merch state_count_3_by_365	587	OriginalMostIndDistance_Cardnum_actual/max_180
539	Amount_Cardnum_Merch state_count_3_by_365	588	OriginalMostIndDistance_Cardnum_actual/sum_180

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589	dow_risk	638	Amount_Merchnum_count_1_by_7
590	OriginalMostDistance_Cardnum_actual/sum_180	639	OriginalMostIndDistance_Cardnum_Industry_sum_365
591	OriginalMostDistance_Cardnum_actual/mean_180	640	Amount_Cardnum_Industry_actual/sum_7
592	OriginalMostDistance_Cardnum_actual/max_180	641	Amount_Cardnum_Merch_state_actual/sum_14
593	Amount_Cardnum_Merch_zip_actual/median_30	642	OriginalMostDistance_Cardnum_sum_180
594	Amount_Cardnum_Merchnum_actual/sum_30	643	Amount_Cardnum_Merch_description_count_1_by_30
595	Amount_Cardnum_Merch_description_actual/max_14	644	OriginalMostDistance_Cardnum_Merch_description_count_1_by_30
596	Amount_Cardnum_actual/median_1	645	OriginalMostIndDistance_Cardnum_Merch_description_count_1_by_30
597	OriginalMostDistance_Cardnum_Merch_description_count_0_by_14	646	OriginalMostIndDistance_Cardnum_count_0_by_7
598	Amount_Cardnum_Industry_actual/sum_0	647	Amount_Cardnum_count_0_by_7
599	OriginalMostIndDistance_Cardnum_Merch_description_count_0_by_14	648	OriginalMostDistance_Cardnum_count_0_by_7
600	Amount_Cardnum_Merch_description_count_0_by_14	649	OriginalMostDistance_Cardnum_Merch_state_count_0_by_14
601	Amount_Cardnum_actual/mean_0	650	Amount_Cardnum_Merch_state_count_0_by_14
602	OriginalMostDistance_Cardnum_Merch_state_count_0_by_365	651	OriginalMostIndDistance_Cardnum_Merch_state_count_0_by_14
603	Amount_Cardnum_Merch_state_count_0_by_365	652	OriginalMostDistance_Cardnum_max_180
604	OriginalMostIndDistance_Cardnum_Merch_state_count_0_by_365	653	OriginalMostDistance_Cardnum_mean_180
605	LAT_original	654	OriginalMostIndDistance_Cardnum_Industry_max_365
606	OriginalMostIndDistance_Cardnum_Merch_zip_count_0_by_14	655	OriginalMostDistance_Merchnum_mean_180
607	OriginalMostDistance_Cardnum_Merch_zip_count_0_by_14	656	Amount_Cardnum_Industry_actual/median_1
608	Amount_Cardnum_Merch_zip_count_0_by_14	657	Amount_Cardnum_Industry_actual/mean_0
609	OriginalMostDistance_Cardnum_Industry_count_1_by_180	658	OriginalMostIndDistance_Merchnum_sum_180
610	OriginalMostIndDistance_Cardnum_Industry_count_1_by_180	659	OriginalMostIndDistance_Merchnum_count_1_by_30
611	Amount_Cardnum_Industry_count_1_by_180	660	OriginalMostDistance_Merchnum_count_1_by_30
612	OriginalMostIndDistance_Cardnum_count_1_by_7	661	Amount_Merchnum_count_1_by_30
613	OriginalMostDistance_Cardnum_count_1_by_7	662	OriginalMostIndDistance_Cardnum_Merch_description_count_3_by_14
614	Amount_Cardnum_count_1_by_7	663	OriginalMostDistance_Cardnum_Merch_description_count_3_by_14
615	Amount_Merchnum_actual/max_30	664	Amount_Cardnum_Merch_description_count_3_by_14
616	Amount_Cardnum_Industry_actual/max_365	665	Amount_Cardnum_count_0_by_30
617	OriginalMostIndDistance_Cardnum_sum_180	666	OriginalMostDistance_Cardnum_count_0_by_30
618	Amount_Cardnum_Industry_actual/median_0	667	OriginalMostIndDistance_Cardnum_count_0_by_30
619	OriginalMostIndDistance_Cardnum_mean_180	668	OriginalMostIndDistance_Cardnum_Merch_zip_day_since_
620	OriginalMostIndDistance_Cardnum_max_180	669	Amount_Cardnum_Merch_zip_day_since_
621	OriginalMostIndDistance_Cardnum_Industry_count_0_by_3	670	OriginalMostDistance_Cardnum_Merch_zip_day_since_
622	OriginalMostDistance_Cardnum_Industry_count_0_by_3	671	OriginalMostDistance_Merchnum_sum_180
623	Amount_Cardnum_Industry_count_0_by_3	672	OriginalMostDistance_Cardnum_Industry_sum_365
624	OriginalMostIndDistance_Cardnum_Merchnum_count_3_by_30	673	OriginalMostDistance_Cardnum_Industry_mean_365
625	Amount_Cardnum_Merchnum_count_3_by_30	674	Amount_Cardnum_count_3_by_7
626	OriginalMostDistance_Cardnum_Merchnum_count_3_by_30	675	OriginalMostDistance_Cardnum_count_3_by_7
627	OriginalMostDistance_Cardnum_Merch_zip_count_3_by_30	676	OriginalMostIndDistance_Cardnum_count_3_by_7
628	Amount_Cardnum_Merch_zip_count_3_by_30	677	OriginalMostIndDistance_Cardnum_Merch_zip_count_3_by_14
629	OriginalMostIndDistance_Cardnum_Merch_zip_count_3_by_30	678	OriginalMostDistance_Cardnum_Merch_zip_count_3_by_14
630	OriginalMostIndDistance_Cardnum_Merch_zip_count_0_by_180	679	Amount_Cardnum_Merch_zip_count_3_by_14
631	OriginalMostDistance_Cardnum_Merch_zip_count_0_by_180	680	OriginalMostDistance_Cardnum_Industry_max_365
632	Amount_Cardnum_Merch_zip_count_0_by_180	681	OriginalMostIndDistance_Merchnum_count_1_by_14
633	OriginalMostIndDistance_Cardnum_Merch_description_count_0_by_180	682	OriginalMostDistance_Merchnum_count_1_by_14
634	OriginalMostDistance_Cardnum_Merch_description_count_0_by_180	683	Amount_Merchnum_count_1_by_14
635	Amount_Cardnum_Merch_description_count_0_by_180	684	Amount_Cardnum_Industry_actual/sum_1
636	OriginalMostIndDistance_Merchnum_count_1_by_7	685	OriginalMostDistance_Cardnum_count_0_by_14
637	OriginalMostDistance_Merchnum_count_1_by_7	686	OriginalMostIndDistance_Cardnum_count_0_by_14

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687	Amount_Cardnum_count_0_by_14	736	Amount_Cardnum_Merch_description_count_3_by_7
688	Amount_Cardnum_Industry_actual/sum_365	737	OriginalMostIndDistance_Cardnum_Merch_description_count_3_by_7
689	Amount_Cardnum_Merchnum_count_1_by_14	738	OriginalMostIndDistance_Cardnum_Merchnum_count_0_by_180
690	OriginalMostDistance_Cardnum_Merchnum_count_1_by_14	739	Amount_Cardnum_Merchnum_count_0_by_180
691	OriginalMostIndDistance_Cardnum_Merchnum_count_1_by_14	740	OriginalMostDistance_Cardnum_Merchnum_count_0_by_180
692	OriginalMostDistance_Cardnum_Merch state_count_1_by_14	741	OriginalMostIndDistance_Cardnum_actual/max_365
693	Amount_Cardnum_Merch state_count_1_by_14	742	OriginalMostIndDistance_Cardnum_actual/sum_365
694	OriginalMostIndDistance_Cardnum_Merch state_count_1_by_14	743	OriginalMostIndDistance_Cardnum_actual/mean_365
695	OriginalMostDistance_Cardnum_Merchnum_count_3_by_14	744	OriginalMostIndDistance_Cardnum_Merchnum_count_1_by_30
696	Amount_Cardnum_Merchnum_count_3_by_14	745	Amount_Cardnum_Merchnum_count_1_by_30
697	Amount_Cardnum_Merch_description_count_3_by_30	746	OriginalMostDistance_Cardnum_Merchnum_count_1_by_30
698	OriginalMostIndDistance_Cardnum_Merch_description_count_3_by_30	747	OriginalMostDistance_Cardnum_actual/max_365
699	OriginalMostIndDistance_Cardnum_Merchnum_count_3_by_14	748	OriginalMostDistance_Cardnum_actual/mean_365
700	OriginalMostDistance_Cardnum_Merch_description_count_3_by_30	749	OriginalMostDistance_Cardnum_actual/sum_365
701	Amount_Cardnum_Merch_description_actual/max_30	750	Amount_Merchnum_sum_365
702	OriginalMostDistance_Merchnum_max_180	751	Amount_Cardnum_count_14
703	Amount_Cardnum_Industry_count_3_by_7	752	OriginalMostDistance_Cardnum_count_14
704	OriginalMostIndDistance_Cardnum_Industry_count_3_by_7	753	OriginalMostIndDistance_Cardnum_count_14
705	OriginalMostDistance_Cardnum_Industry_count_3_by_7	754	Amount_Cardnum_count_0_by_365
706	Amount_Merchnum_count_0_by_7	755	OriginalMostIndDistance_Cardnum_count_0_by_365
707	OriginalMostDistance_Merchnum_count_0_by_7	756	OriginalMostDistance_Cardnum_count_0_by_365
708	OriginalMostIndDistance_Merchnum_count_0_by_7	757	OriginalMostIndDistance_Cardnum_Merch zip_count_3_by_7
709	OriginalMostDistance_Cardnum_Merch zip_count_0_by_30	758	OriginalMostDistance_Cardnum_Merch zip_count_3_by_7
710	Amount_Cardnum_Merch zip_count_0_by_30	759	Amount_Cardnum_Merch zip_count_3_by_7
711	OriginalMostIndDistance_Cardnum_Merch zip_count_0_by_30	760	Amount_Cardnum_Merch_description_count_1_by_3
712	OriginalMostDistance_Cardnum_Merchnum_count_1_by_7	761	OriginalMostDistance_Cardnum_Merch_description_count_1_by_3
713	OriginalMostIndDistance_Cardnum_Merchnum_count_1_by_7	762	OriginalMostIndDistance_Cardnum_Merch_description_count_1_by_3
714	Amount_Cardnum_Merchnum_count_1_by_7	763	OriginalMostIndDistance_Cardnum_Merchnum_count_0_by_365
715	OriginalMostIndDistance_Cardnum_count_0_by_180	764	OriginalMostDistance_Cardnum_Merchnum_count_0_by_365
716	Amount_Cardnum_count_0_by_180	765	Amount_Cardnum_Merchnum_count_0_by_365
717	OriginalMostDistance_Cardnum_count_0_by_180	766	OriginalMostIndDistance_Cardnum_Merch state_count_1_by_3
718	Amount_Cardnum_Merch_description_count_1_by_7	767	OriginalMostDistance_Cardnum_Merch state_count_1_by_3
719	OriginalMostDistance_Cardnum_Merch_description_count_1_by_7	768	Amount_Cardnum_Merch state_count_1_by_3
720	OriginalMostIndDistance_Cardnum_Merch_description_count_1_by_7	769	Amount_Cardnum_Industry_sum_30
721	Amount_Cardnum_Merch zip_count_1_by_7	770	Amount_Cardnum_Merch_description_actual/sum_365
722	OriginalMostIndDistance_Cardnum_Merch zip_count_1_by_7	771	OriginalMostIndDistance_Merchnum_max_180
723	OriginalMostDistance_Cardnum_Merch zip_count_1_by_7	772	Amount_Cardnum_Merch state_actual/sum_365
724	OriginalMostDistance_Merchnum_actual/sum_365	773	Amount_Cardnum_Industry_actual/max_14
725	OriginalMostDistance_Cardnum_Merchnum_count_3_by_7	774	Amount_Cardnum_Merch zip_actual/sum_180
726	OriginalMostDistance_Merchnum_actual/mean_365	775	OriginalMostIndDistance_Cardnum_Merch state_count_3_by_7
727	Amount_Cardnum_Merchnum_count_3_by_7	776	Amount_Cardnum_Merch state_count_3_by_7
728	OriginalMostDistance_Merchnum_actual/sum_365	777	OriginalMostDistance_Cardnum_Merch state_count_3_by_7
729	OriginalMostIndDistance_Cardnum_Merchnum_count_3_by_7	778	OriginalMostIndDistance_Merchnum_mean_180
730	Amount_Merchnum_actual/sum_14	779	Amount_Cardnum_Merch state_count_14
731	Amount_Cardnum_Merch state_actual/sum_180	780	OriginalMostDistance_Cardnum_Merch state_count_14
732	OriginalMostIndDistance_Merchnum_actual/max_365	781	OriginalMostIndDistance_Cardnum_Merch state_count_14
733	OriginalMostIndDistance_Merchnum_actual/mean_365	782	OriginalMostIndDistance_Cardnum_Merch state_mean_365
734	OriginalMostIndDistance_Merchnum_actual/sum_365	783	OriginalMostDistance_Cardnum_Merch state_mean_365
735	OriginalMostDistance_Cardnum_Merch_description_count_3_by_7	784	Amount_Cardnum_Merch state_count_0_by_180

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785	OriginalMostIndDistance_Cardnum_Merch state_count_0_by_180	834	OriginalMostDistance_Cardnum_Merch state_count_3_by_14
786	OriginalMostDistance_Cardnum_Merch state_count_0_by_180	835	Amount_Cardnum_Merch state_count_3_by_14
787	Amount_Cardnum_Merch_description_count_1_by_14	836	OriginalMostIndDistance_Cardnum_Merch state_count_3_by_14
788	OriginalMostDistance_Cardnum_Merch_description_count_1_by_14	837	Amount_Cardnum_Industry_count_7
789	OriginalMostIndDistance_Cardnum_Merch_description_count_1_by_14	838	OriginalMostDistance_Cardnum_Industry_count_7
790	OriginalMostIndDistance_Cardnum_Merch zip_count_0_by_365	839	OriginalMostIndDistance_Cardnum_Industry_count_7
791	OriginalMostIndDistance_Cardnum_Merch state_max_365	840	OriginalMostDistance_Cardnum_Merchnum_count_1_by_3
792	OriginalMostDistance_Cardnum_Merch zip_count_0_by_365	841	OriginalMostIndDistance_Cardnum_Merchnum_count_1_by_3
793	Amount_Cardnum_Merch zip_count_0_by_365	842	Amount_Cardnum_Merchnum_count_1_by_3
794	OriginalMostIndDistance_Cardnum_Merch state_sum_365	843	OriginalMostDistance_Merchnum_sum_365
795	OriginalMostDistance_Cardnum_Merch state_max_365	844	Amount_Cardnum_count_30
796	OriginalMostDistance_Cardnum_Merch state_sum_365	845	OriginalMostIndDistance_Cardnum_count_30
797	OriginalMostDistance_Merchnum_actual/sum_180	846	OriginalMostDistance_Cardnum_count_30
798	OriginalMostDistance_Merchnum_actual/mean_180	847	OriginalMostIndDistance_Cardnum_Industry_actual/max_180
799	OriginalMostDistance_Merchnum_actual/max_180	848	OriginalMostIndDistance_Cardnum_Industry_actual/sum_180
800	Amount_Cardnum_Industry_actual/sum_180	849	OriginalMostIndDistance_Cardnum_Industry_actual/mean_180
801	OriginalMostIndDistance_Merchnum_actual/sum_180	850	OriginalMostIndDistance_Cardnum_Industry_count_3
802	OriginalMostIndDistance_Merchnum_actual/max_180	851	Amount_Cardnum_Industry_count_3
803	OriginalMostIndDistance_Merchnum_actual/mean_180	852	OriginalMostDistance_Cardnum_Industry_count_3
804	Amount_Cardnum_actual/max_0	853	OriginalMostIndDistance_Cardnum_Merch zip_sum_365
805	OriginalMostDistance_Cardnum_Merch state_mean_180	854	OriginalMostDistance_Cardnum_Industry_actual/mean_180
806	OriginalMostDistance_Cardnum_Merch state_sum_180	855	OriginalMostDistance_Cardnum_Industry_actual/max_180
807	OriginalMostDistance_Cardnum_Merch state_max_180	856	OriginalMostDistance_Cardnum_Industry_actual/sum_180
808	Amount_Cardnum_Industry_count_1_by_7	857	OriginalMostIndDistance_Cardnum_Merch zip_max_365
809	OriginalMostIndDistance_Cardnum_Industry_count_1_by_7	858	OriginalMostIndDistance_Cardnum_Merch zip_mean_365
810	OriginalMostDistance_Cardnum_Industry_count_1_by_7	859	OriginalMostDistance_Cardnum_Merch zip_sum_365
811	OriginalMostIndDistance_Cardnum_Industry_actual/mean_365	860	OriginalMostDistance_Cardnum_Merch zip_max_365
812	OriginalMostIndDistance_Cardnum_Industry_actual/max_365	861	OriginalMostDistance_Cardnum_Merch zip_mean_365
813	OriginalMostIndDistance_Cardnum_Industry_actual/sum_365	862	OriginalMostIndDistance_Cardnum_Merchnum_count_0_by_30
814	OriginalMostIndDistance_Cardnum_Merch zip_count_1_by_3	863	OriginalMostDistance_Cardnum_Merchnum_count_0_by_30
815	OriginalMostDistance_Cardnum_Merch zip_count_1_by_3	864	Amount_Cardnum_Merchnum_count_0_by_30
816	Amount_Cardnum_Merch zip_count_1_by_3	865	OriginalMostIndDistance_Cardnum_Industry_count_3_by_14
817	Amount_Cardnum_Merch zip_actual/max_365	866	OriginalMostDistance_Cardnum_Industry_count_3_by_14
818	OriginalMostIndDistance_Cardnum_Merch state_max_180	867	Amount_Cardnum_Industry_count_3_by_14
819	OriginalMostIndDistance_Cardnum_Merch state_mean_180	868	OriginalMostIndDistance_Cardnum_sum_30
820	OriginalMostIndDistance_Cardnum_Merch state_sum_180	869	OriginalMostIndDistance_Cardnum_max_30
821	OriginalMostDistance_Cardnum_Industry_actual/mean_365	870	OriginalMostIndDistance_Cardnum_mean_30
822	OriginalMostDistance_Cardnum_Industry_actual/sum_365	871	OriginalMostIndDistance_Merchnum_count_7
823	OriginalMostDistance_Cardnum_Industry_actual/max_365	872	OriginalMostDistance_Merchnum_count_7
824	Amount_Cardnum_Merch_description_count_0_by_365	873	Amount_Merchnum_count_7
825	OriginalMostIndDistance_Cardnum_Merch_description_count_0_by_365	874	OriginalMostIndDistance_Cardnum_Merch_description_mean_365
826	OriginalMostDistance_Cardnum_Merch_description_count_0_by_365	875	OriginalMostIndDistance_Cardnum_Merch_description_sum_365
827	OriginalMostIndDistance_Merchnum_count_0_by_14	876	OriginalMostIndDistance_Cardnum_Merch_description_max_365
828	OriginalMostDistance_Merchnum_count_0_by_14	877	OriginalMostDistance_Cardnum_Merch_description_mean_365
829	Amount_Merchnum_count_0_by_14	878	OriginalMostDistance_Cardnum_Merch_description_sum_365
830	Amount_Cardnum_Industry_count_1_by_3	879	OriginalMostIndDistance_Cardnum_Merch zip_mean_180
831	OriginalMostDistance_Cardnum_Industry_count_1_by_3	880	OriginalMostIndDistance_Cardnum_Merch zip_sum_180
832	OriginalMostIndDistance_Cardnum_Industry_count_1_by_3	881	OriginalMostIndDistance_Cardnum_Merch zip_max_180
833	Amount_Cardnum_Merchnum_actual/max_30	882	OriginalMostDistance_Cardnum_Merch_description_max_365

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883	OriginalMostIndDistance_Merchnum_mean_30	932	OriginalMostIndDistance_Cardnum_Industry_count_0_by_180
884	OriginalMostIndDistance_Merchnum_sum_30	933	Amount_Cardnum_actual/sum_3
885	OriginalMostIndDistance_Merchnum_max_30	934	Amount_Cardnum_Industry_actual/sum_3
886	OriginalMostDistance_Cardnum_Merch zip_mean_180	935	OriginalMostIndDistance_Cardnum_Merchnum_sum_180
887	OriginalMostDistance_Cardnum_Merch zip_sum_180	936	OriginalMostIndDistance_Cardnum_Merchnum_max_180
888	OriginalMostDistance_Cardnum_Merch zip_max_180	937	OriginalMostIndDistance_Cardnum_Merchnum_mean_180
889	OriginalMostDistance_Merchnum_sum_30	938	Amount_Cardnum_actual/max_3
890	OriginalMostDistance_Merchnum_max_30	939	OriginalMostDistance_Cardnum_Industry_sum_30
891	OriginalMostDistance_Merchnum_mean_30	940	OriginalMostDistance_Cardnum_Industry_mean_30
892	OriginalMostDistance_Cardnum_sum_30	941	OriginalMostDistance_Cardnum_Industry_max_30
893	OriginalMostDistance_Cardnum_mean_30	942	Amount_Cardnum_Industry_count_3_by_365
894	OriginalMostDistance_Cardnum_max_30	943	OriginalMostIndDistance_Cardnum_Industry_count_3_by_365
895	Amount_Cardnum_actual/max_14	944	OriginalMostDistance_Cardnum_Industry_count_3_by_365
896	Amount_Cardnum_Industry_actual/max_1	945	Amount_Cardnum_Industry_count_1_by_365
897	OriginalMostDistance_Cardnum_Merch zip_count_1_by_14	946	OriginalMostDistance_Cardnum_Industry_count_1_by_365
898	OriginalMostIndDistance_Cardnum_Merch zip_count_1_by_14	947	OriginalMostIndDistance_Cardnum_Industry_count_1_by_365
899	Amount_Cardnum_Merch zip_count_1_by_14	948	OriginalMostDistance_Merchnum_count_0
900	Amount_Cardnum_actual/max_1	949	Amount_Merchnum_count_0
901	Amount_Cardnum_Merch zip_count_30	950	OriginalMostIndDistance_Merchnum_count_0
902	OriginalMostDistance_Cardnum_Merch zip_count_30	951	Amount_Merchnum_actual/sum_3
903	OriginalMostIndDistance_Cardnum_Merch zip_count_30	952	OriginalMostIndDistance_Cardnum_Industry_count_1_by_30
904	OriginalMostDistance_Cardnum_Merch_description_count_0_by_30	953	OriginalMostDistance_Cardnum_Industry_count_1_by_30
905	OriginalMostIndDistance_Cardnum_Merch_description_count_0_by_30	954	Amount_Cardnum_Industry_count_1_by_30
906	Amount_Cardnum_Merch_description_count_0_by_30	955	OriginalMostIndDistance_Merchnum_max_365
907	Amount_Cardnum_Merch state_actual/max_365	956	OriginalMostIndDistance_Cardnum_Industry_mean_30
908	Amount_Cardnum_Merch_description_count_180	957	OriginalMostIndDistance_Cardnum_Industry_sum_30
909	OriginalMostDistance_Cardnum_Merch_description_count_180	958	OriginalMostIndDistance_Cardnum_Industry_max_30
910	OriginalMostIndDistance_Cardnum_Merch_description_count_180	959	Amount_Merchnum_count_0_by_3
911	OriginalMostIndDistance_Cardnum_Merch_description_sum_180	960	OriginalMostIndDistance_Merchnum_count_0_by_3
912	OriginalMostIndDistance_Cardnum_Merch_description_max_180	961	OriginalMostDistance_Merchnum_count_0_by_3
913	OriginalMostIndDistance_Cardnum_Merch_description_mean_180	962	Amount_Cardnum_Merch state_actual/max_14
914	Amount_Cardnum_count_1_by_3	963	Amount_Cardnum_Merch_description_actual/sum_30
915	OriginalMostIndDistance_Cardnum_Merch state_actual/max_365	964	OriginalMostIndDistance_Merchnum_mean_14
916	OriginalMostDistance_Cardnum_count_1_by_3	965	OriginalMostIndDistance_Merchnum_sum_14
917	OriginalMostIndDistance_Cardnum_count_1_by_3	966	OriginalMostIndDistance_Merchnum_max_14
918	OriginalMostIndDistance_Cardnum_Merch state_actual/max_365	967	OriginalMostDistance_Merchnum_sum_14
919	OriginalMostIndDistance_Cardnum_Merch state_actual/sum_365	968	OriginalMostDistance_Merchnum_max_14
920	OriginalMostIndDistance_Cardnum_Merchnum_mean_365	969	OriginalMostDistance_Merchnum_mean_14
921	OriginalMostDistance_Cardnum_Merch state_actual/max_365	970	OriginalMostIndDistance_Cardnum_Merchnum_mean_365
922	OriginalMostDistance_Cardnum_Merch state_actual/max_365	971	OriginalMostDistance_Cardnum_Merchnum_sum_365
923	OriginalMostDistance_Cardnum_Merch state_actual/sum_365	972	OriginalMostDistance_Cardnum_Merchnum_max_365
924	OriginalMostDistance_Cardnum_Merch_description_mean_180	973	Amount_Cardnum_Industry_actual/max_3
925	OriginalMostDistance_Cardnum_Merch_description_max_180	974	OriginalMostIndDistance_Cardnum_Merch zip_actual/mean_365
926	OriginalMostDistance_Cardnum_Merch_description_sum_180	975	OriginalMostIndDistance_Cardnum_Merch zip_actual/sum_365
927	Amount_Cardnum_Industry_actual/max_0	976	OriginalMostIndDistance_Cardnum_Merch zip_actual/max_365
928	Amount_Cardnum_Industry_count_0_by_180	977	Amount_Cardnum_actual/sum_30
929	OriginalMostDistance_Cardnum_Industry_count_0_by_180	978	Amount_Cardnum_Merch zip_actual/sum_30
930	OriginalMostIndDistance_Cardnum_Merchnum_max_365	979	Amount_Cardnum_Industry_actual/max_30
931	OriginalMostIndDistance_Cardnum_Merchnum_sum_365	980	OriginalMostIndDistance_Cardnum_Merch state_mean_30

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981	OriginalMostIndDistance_Cardnum_Merch state_sum_30	1030	OriginalMostIndDistance_Cardnum_Industry_max_14
982	OriginalMostIndDistance_Cardnum_Merch state_max_30	1031	OriginalMostDistance_Cardnum_Industry_mean_14
983	OriginalMostDistance_Cardnum_Merch state_max_30	1032	OriginalMostDistance_Cardnum_Industry_max_14
984	OriginalMostDistance_Cardnum_Merch state_mean_30	1033	OriginalMostDistance_Cardnum_Industry_sum_14
985	OriginalMostDistance_Cardnum_Merch state_sum_30	1034	OriginalMostDistance_Cardnum_Merch state_actual/max_180
986	OriginalMostDistance_Cardnum_Merch zip_actual/sum_365	1035	OriginalMostDistance_Cardnum_Merch state_actual/mean_180
987	OriginalMostDistance_Cardnum_Merch zip_actual/max_365	1036	OriginalMostDistance_Cardnum_Merch state_actual/sum_180
988	OriginalMostDistance_Cardnum_Merch zip_actual/mean_365	1037	Amount_Cardnum_actual/sum_7
989	Amount_Cardnum_Merch zip_actual/max_30	1038	OriginalMostIndDistance_Cardnum_Industry_count_1
990	OriginalMostDistance_Cardnum_Merchnum_sum_180	1039	Amount_Cardnum_Industry_count_1
991	OriginalMostDistance_Cardnum_Merchnum_mean_180	1040	OriginalMostDistance_Cardnum_Industry_count_1
992	OriginalMostDistance_Cardnum_Merchnum_max_180	1041	Amount_Cardnum_Merch state_actual/sum_30
993	OriginalMostIndDistance_Merchnum_count_14	1042	OriginalMostDistance_Cardnum_Merchnum_count_14
994	OriginalMostDistance_Merchnum_count_14	1043	Amount_Cardnum_Merchnum_count_14
995	Amount_Merchnum_count_14	1044	OriginalMostIndDistance_Cardnum_Merchnum_count_14
996	Amount_Cardnum_Merchnum_count_180	1045	OriginalMostIndDistance_Cardnum_Merch state_actual/mean_180
997	OriginalMostIndDistance_Cardnum_Merchnum_count_180	1046	OriginalMostIndDistance_Cardnum_Merch state_actual/sum_180
998	OriginalMostDistance_Cardnum_Merchnum_count_180	1047	OriginalMostIndDistance_Cardnum_Merch state_actual/max_180
999	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_365	1048	Amount_Cardnum_Merch_description_count_14
1000	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_365	1049	OriginalMostDistance_Cardnum_Merch_description_count_14
1001	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_365	1050	OriginalMostIndDistance_Cardnum_Merch_description_count_14
1002	OriginalMostDistance_Cardnum_Merch_description_actual/mean_365	1051	Amount_Cardnum_Industry_count_0_by_7
1003	OriginalMostDistance_Cardnum_Merch_description_actual/sum_365	1052	OriginalMostIndDistance_Cardnum_Industry_count_0_by_7
1004	OriginalMostDistance_Cardnum_Merch_description_actual/max_365	1053	OriginalMostDistance_Cardnum_Merch zip_count_14
1005	OriginalMostIndDistance_Cardnum_max_14	1054	OriginalMostDistance_Cardnum_Industry_count_0_by_7
1006	Amount_Merchnum_count_180	1055	OriginalMostIndDistance_Cardnum_Merch zip_count_14
1007	OriginalMostDistance_Merchnum_count_180	1056	Amount_Cardnum_Merch zip_count_14
1008	OriginalMostIndDistance_Merchnum_count_180	1057	OriginalMostDistance_Cardnum_Industry_count_180
1009	OriginalMostIndDistance_Cardnum_sum_14	1058	OriginalMostIndDistance_Cardnum_Industry_count_180
1010	OriginalMostDistance_Cardnum_max_14	1059	Amount_Cardnum_Industry_count_180
1011	OriginalMostDistance_Cardnum_sum_14	1060	OriginalMostDistance_Cardnum_mean_365
1012	OriginalMostIndDistance_Cardnum_mean_14	1061	OriginalMostDistance_Cardnum_Merch_description_count_30
1013	OriginalMostDistance_Cardnum_mean_14	1062	OriginalMostIndDistance_Cardnum_Merch_description_count_30
1014	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_365	1063	Amount_Cardnum_Merch_description_count_30
1015	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_365	1064	OriginalMostIndDistance_Cardnum_Merchnum_count_30
1016	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_365	1065	Amount_Cardnum_Merchnum_count_30
1017	Amount_Cardnum_Industry_actual/sum_14	1066	OriginalMostDistance_Cardnum_Merchnum_count_30
1018	OriginalMostDistance_Cardnum_Merchnum_actual/sum_365	1067	OriginalMostIndDistance_Cardnum_mean_365
1019	OriginalMostDistance_Cardnum_Merchnum_actual/mean_365	1068	OriginalMostIndDistance_Merchnum_actual/sum_30
1020	OriginalMostDistance_Cardnum_Merchnum_actual/max_365	1069	OriginalMostIndDistance_Merchnum_actual/mean_30
1021	Amount_Merchnum_actual/max_7	1070	OriginalMostIndDistance_Merchnum_actual/max_30
1022	Amount_Merchnum_actual/sum_1	1071	OriginalMostDistance_Merchnum_actual/mean_30
1023	OriginalMostDistance_Cardnum_Merch state_count_30	1072	OriginalMostDistance_Merchnum_actual/max_30
1024	Amount_Cardnum_Merch state_count_30	1073	OriginalMostDistance_Merchnum_actual/sum_30
1025	OriginalMostIndDistance_Cardnum_Merch state_count_30	1074	OriginalMostDistance_Merchnum_count_3_by_365
1026	Amount_Cardnum_Industry_sum_180	1075	OriginalMostIndDistance_Merchnum_count_3_by_365
1027	Amount_Cardnum_Industry_sum_365	1076	Amount_Merchnum_count_3_by_365
1028	OriginalMostIndDistance_Cardnum_Industry_sum_14	1077	OriginalMostDistance_Cardnum_actual/sum_30
1029	OriginalMostIndDistance_Cardnum_Industry_mean_14	1078	OriginalMostDistance_Cardnum_actual/mean_30

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1079	OriginalMostDistance_Cardnum_actual/max_30	1128	OriginalMostIndDistance_Cardnum_Industry_mean_365
1080	Amount_Merchnum_count_0_by_365	1129	OriginalMostDistance_Merchnum_count_1_by_365
1081	OriginalMostDistance_Merchnum_count_0_by_365	1130	Amount_Merchnum_count_1_by_365
1082	OriginalMostIndDistance_Merchnum_count_0_by_365	1131	OriginalMostIndDistance_Merchnum_count_1_by_365
1083	OriginalMostIndDistance_Cardnum_actual/mean_30	1132	Amount_Cardnum_Merch_description_actual/sum_180
1084	OriginalMostIndDistance_Cardnum_actual/max_30	1133	OriginalMostDistance_Merchnum_count_3_by_180
1085	OriginalMostIndDistance_Cardnum_actual/sum_30	1134	OriginalMostIndDistance_Merchnum_count_3_by_180
1086	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_180	1135	Amount_Merchnum_count_3_by_180
1087	OriginalMostIndDistance_Cardnum_Merch_zip_actual/max_180	1136	Amount_Cardnum_Merch_state_actual/max_30
1088	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_180	1137	Amount_Merchnum_count_0_by_180
1089	OriginalMostDistance_Cardnum_Merch_zip_actual/sum_180	1138	OriginalMostIndDistance_Merchnum_count_0_by_180
1090	OriginalMostDistance_Cardnum_Merch_zip_actual/max_180	1139	OriginalMostDistance_Merchnum_count_0_by_180
1091	OriginalMostDistance_Cardnum_Merch_zip_actual/mean_180	1140	OriginalMostIndDistance_Merchnum_actual/max_14
1092	Amount_Merchnum_actual/max_1	1141	OriginalMostIndDistance_Merchnum_actual/mean_14
1093	OriginalMostDistance_Cardnum_Industry_count_0_by_365	1142	OriginalMostIndDistance_Merchnum_actual/sum_14
1094	Amount_Cardnum_Industry_count_0_by_365	1143	OriginalMostIndDistance_Merchnum_count_1_by_3
1095	OriginalMostIndDistance_Cardnum_Industry_count_0_by_365	1144	Amount_Merchnum_count_1_by_3
1096	Amount_Merchnum_count_3_by_14	1145	OriginalMostDistance_Merchnum_count_1_by_3
1097	OriginalMostDistance_Merchnum_count_3_by_14	1146	OriginalMostDistance_Merchnum_actual/max_14
1098	OriginalMostIndDistance_Merchnum_count_3_by_14	1147	OriginalMostDistance_Merchnum_actual/mean_14
1099	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_180	1148	OriginalMostDistance_Merchnum_actual/sum_14
1100	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_180	1149	OriginalMostIndDistance_Cardnum_Merch_state_actual/max_30
1101	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_180	1150	OriginalMostIndDistance_Cardnum_Merch_state_actual/sum_30
1102	Amount_Merchnum_actual/max_3	1151	OriginalMostIndDistance_Cardnum_Merch_state_actual/mean_30
1103	OriginalMostDistance_Cardnum_Merch_description_actual/max_180	1152	Amount_Merchnum_count_3_by_7
1104	OriginalMostDistance_Cardnum_Merch_description_actual/mean_180	1153	OriginalMostIndDistance_Merchnum_count_3_by_7
1105	OriginalMostDistance_Cardnum_Merch_description_actual/sum_180	1154	OriginalMostDistance_Merchnum_count_3_by_7
1106	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_180	1155	OriginalMostDistance_Cardnum_Merchnum_count_365
1107	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_180	1156	OriginalMostIndDistance_Cardnum_Merchnum_count_365
1108	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_180	1157	Amount_Cardnum_Merchnum_count_365
1109	OriginalMostDistance_Merchnum_count_1_by_180	1158	OriginalMostDistance_Cardnum_Merch_state_actual/max_30
1110	OriginalMostIndDistance_Merchnum_count_1_by_180	1159	OriginalMostDistance_Cardnum_Merch_state_actual/sum_30
1111	Amount_Merchnum_count_1_by_180	1160	OriginalMostDistance_Cardnum_Merch_state_actual/max_30
1112	OriginalMostIndDistance_Cardnum_Industry_actual/max_30	1161	OriginalMostIndDistance_Cardnum_actual/mean_14
1113	OriginalMostIndDistance_Cardnum_Industry_actual/mean_30	1162	OriginalMostIndDistance_Cardnum_actual/max_14
1114	OriginalMostIndDistance_Cardnum_Industry_actual/sum_30	1163	OriginalMostIndDistance_Cardnum_actual/sum_14
1115	OriginalMostIndDistance_Merchnum_count_3	1164	Amount_Merchnum_actual/sum_180
1116	Amount_Cardnum_Merchnum_actual/max_180	1165	OriginalMostDistance_Merchnum_count_0_by_30
1117	Amount_Merchnum_actual/max_0	1166	OriginalMostIndDistance_Merchnum_count_0_by_30
1118	OriginalMostDistance_Merchnum_count_3	1167	Amount_Merchnum_count_0_by_30
1119	Amount_Merchnum_count_3	1168	OriginalMostDistance_Cardnum_Industry_count_365
1120	Amount_Cardnum_Industry_actual/sum_30	1169	Amount_Cardnum_Industry_count_365
1121	OriginalMostDistance_Cardnum_Industry_actual/max_30	1170	OriginalMostIndDistance_Cardnum_Industry_count_365
1122	OriginalMostDistance_Cardnum_Industry_actual/sum_30	1171	Amount_Merchnum_actual/sum_365
1123	OriginalMostDistance_Cardnum_Industry_actual/mean_30	1172	OriginalMostDistance_Cardnum_actual/sum_14
1124	OriginalMostIndDistance_Cardnum_Industry_mean_180	1173	OriginalMostDistance_Cardnum_actual/mean_14
1125	OriginalMostDistance_Cardnum_Merchnum_actual/max_180	1174	OriginalMostDistance_Cardnum_actual/max_14
1126	OriginalMostDistance_Cardnum_Merchnum_actual/sum_180	1175	OriginalMostIndDistance_Cardnum_Merch_state_count_0_by_30
1127	OriginalMostDistance_Cardnum_Merchnum_actual/mean_180	1176	Amount_Cardnum_Merch_state_count_0_by_30

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1177	OriginalMostDistance_Cardnum_Merch state_count_0_by_30	1226	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_180
1178	OriginalMostIndDistance_Cardnum_Industry_actual/max_14	1227	OriginalMostDistance_Cardnum_Merch_zip_actual/median_180
1179	OriginalMostIndDistance_Cardnum_Industry_actual/mean_14	1228	OriginalMostIndDistance_Merchnum_mean_365
1180	OriginalMostIndDistance_Cardnum_Industry_actual/sum_14	1229	OriginalMostIndDistance_Cardnum_sum_365
1181	OriginalMostDistance_Cardnum_Industry_actual/max_14	1230	OriginalMostDistance_Cardnum_Merchnum_actual/median_365
1182	OriginalMostDistance_Cardnum_Industry_actual/sum_14	1231	OriginalMostDistance_Cardnum_Merch_description_actual/sum_30
1183	OriginalMostDistance_Cardnum_Industry_actual/mean_14	1232	OriginalMostDistance_Cardnum_Merch_description_actual/max_30
1184	OriginalMostDistance_Cardnum_Industry_sum_180	1233	OriginalMostDistance_Cardnum_Merch_description_actual/mean_30
1185	OriginalMostDistance_Cardnum_Industry_max_180	1234	Amount_Cardnum_count_180
1186	OriginalMostDistance_Cardnum_Industry_mean_180	1235	OriginalMostIndDistance_Cardnum_Industry_count_0_by_14
1187	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_365	1236	OriginalMostDistance_Cardnum_count_180
1188	OriginalMostIndDistance_Cardnum_Merch_state_actual/median_365	1237	Amount_Cardnum_Industry_count_0_by_14
1189	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_30	1238	OriginalMostDistance_Cardnum_Industry_count_0_by_14
1190	OriginalMostIndDistance_Cardnum_Merch_zip_actual/max_30	1239	OriginalMostIndDistance_Cardnum_count_180
1191	OriginalMostDistance_Cardnum_Merch_state_actual/median_365	1240	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_180
1192	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_30	1241	Amount_Cardnum_Industry_actual/max_7
1193	Amount_Merchnum_count_1	1242	OriginalMostDistance_Cardnum_Merchnum_actual/max_30
1194	OriginalMostIndDistance_Merchnum_count_1	1243	OriginalMostDistance_Cardnum_Merchnum_actual/sum_30
1195	OriginalMostDistance_Merchnum_count_1	1244	OriginalMostDistance_Cardnum_Merchnum_actual/mean_30
1196	OriginalMostIndDistance_Cardnum_Merch_state_count_365	1245	OriginalMostIndDistance_Cardnum_Merch_description_count_365
1197	OriginalMostDistance_Cardnum_Merch_state_count_365	1246	OriginalMostDistance_Cardnum_Merch_description_count_365
1198	Amount_Cardnum_Merch_state_count_365	1247	Amount_Cardnum_Merch_description_count_365
1199	Amount_Cardnum_Merch_zip_actual/sum_365	1248	OriginalMostIndDistance_Cardnum_Industry_sum_180
1200	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_365	1249	OriginalMostIndDistance_Cardnum_Industry_max_180
1201	Amount_Cardnum_Merch_zip_actual/max_180	1250	OriginalMostIndDistance_Cardnum_Merch_state_actual/max_14
1202	OriginalMostDistance_Cardnum_Merch_zip_actual/median_365	1251	OriginalMostIndDistance_Cardnum_Merch_state_actual/mean_14
1203	LONG_original	1252	OriginalMostIndDistance_Cardnum_Merch_state_actual/sum_14
1204	OriginalMostIndDistance_Cardnum_Merch_state_actual/median_180	1253	OriginalMostDistance_Cardnum_Merch_state_actual/mean_14
1205	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_180	1254	OriginalMostDistance_Cardnum_Merch_state_actual/max_14
1206	OriginalMostDistance_Cardnum_Industry_count_30	1255	OriginalMostDistance_Cardnum_Merch_state_actual/sum_14
1207	OriginalMostIndDistance_Cardnum_Industry_actual/median_365	1256	OriginalMostDistance_Cardnum_Merch_description_actual/median_180
1208	Amount_Cardnum_Industry_count_30	1257	OriginalMostDistance_Cardnum_Industry_actual/median_365
1209	OriginalMostIndDistance_Cardnum_Industry_count_30	1258	OriginalMostDistance_Cardnum_Merchnum_actual/median_180
1210	Amount_Cardnum_Merch_state_count_1_by_7	1259	OriginalMostDistance_Cardnum_Industry_actual/median_180
1211	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_365	1260	OriginalMostIndDistance_Merchnum_actual/sum_7
1212	OriginalMostDistance_Cardnum_Merch_state_count_1_by_7	1261	OriginalMostIndDistance_Merchnum_actual/max_7
1213	OriginalMostIndDistance_Cardnum_Merch_state_count_1_by_7	1262	OriginalMostIndDistance_Merchnum_actual/mean_7
1214	OriginalMostDistance_Cardnum_Merch_zip_actual/mean_30	1263	OriginalMostDistance_Merchnum_actual/sum_7
1215	OriginalMostDistance_Cardnum_Merch_zip_actual/max_30	1264	OriginalMostDistance_Merchnum_actual/mean_7
1216	OriginalMostDistance_Cardnum_Merch_zip_actual/sum_30	1265	OriginalMostDistance_Merchnum_actual/max_7
1217	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_30	1266	OriginalMostIndDistance_Merchnum_count_365
1218	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_30	1267	Amount_Merchnum_count_365
1219	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_30	1268	OriginalMostDistance_Merchnum_count_365
1220	OriginalMostDistance_Cardnum_Merch_description_actual/median_365	1269	OriginalMostIndDistance_Cardnum_Merch_state_actual/median_30
1221	OriginalMostDistance_Cardnum_Merch_state_actual/median_180	1270	Amount_Cardnum_Merch_description_actual/max_365
1222	OriginalMostIndDistance_Cardnum_Industry_actual/median_180	1271	OriginalMostIndDistance_Merchnum_actual/median_180
1223	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_30	1272	OriginalMostDistance_Merchnum_max_365
1224	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_30	1273	OriginalMostDistance_Cardnum_Merch_state_actual/median_30
1225	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_30	1274	Amount_Merchnum_actual/max_14

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1275	OriginalMostDistance_Merchnum_actual/median_180	1324	OriginalMostIndDistance_Cardnum_Industry_actual/median_14
1276	OriginalMostIndDistance_Cardnum_Industry_actual/median_30	1325	OriginalMostDistance_Merchnum_actual/median_30
1277	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_30	1326	OriginalMostIndDistance_Cardnum_Industry_actual/mean_7
1278	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_30	1327	OriginalMostIndDistance_Cardnum_actual/median_30
1279	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_30	1328	OriginalMostIndDistance_Cardnum_Industry_actual/sum_7
1280	Amount_Cardnum_Merch_description_actual/max_180	1329	OriginalMostIndDistance_Cardnum_Industry_actual/max_7
1281	Amount_Cardnum_Merchnum_actual/max_365	1330	OriginalMostDistance_Merchnum_actual/median_365
1282	OriginalMostIndDistance_Cardnum_actual/mean_7	1331	OriginalMostDistance_Cardnum_Industry_actual/max_7
1283	OriginalMostIndDistance_Cardnum_actual/sum_7	1332	OriginalMostDistance_Cardnum_Industry_actual/sum_7
1284	OriginalMostIndDistance_Cardnum_actual/max_7	1333	OriginalMostDistance_Cardnum_Industry_actual/mean_7
1285	OriginalMostDistance_Cardnum_Merch_zip_actual/median_30	1334	Amount_Merchnum_actual/sum_7
1286	Amount_Merchnum_count_30	1335	OriginalMostDistance_Cardnum_Merch_state_actual/median_14
1287	OriginalMostIndDistance_Merchnum_count_30	1336	OriginalMostIndDistance_Cardnum_actual/median_180
1288	OriginalMostDistance_Merchnum_count_30	1337	OriginalMostIndDistance_Cardnum_actual/median_365
1289	OriginalMostDistance_Cardnum_actual/sum_7	1338	Amount_Cardnum_actual/max_7
1290	OriginalMostDistance_Cardnum_actual/mean_7	1339	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_14
1291	OriginalMostDistance_Cardnum_actual/max_7	1340	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_14
1292	Amount_Merchnum_actual/sum_30	1341	OriginalMostDistance_Cardnum_Industry_actual/median_14
1293	OriginalMostDistance_Cardnum_Merch_zip_count_365	1342	OriginalMostIndDistance_Cardnum_actual/median_14
1294	OriginalMostIndDistance_Cardnum_Merch_zip_count_365	1343	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_14
1295	Amount_Cardnum_Merch_zip_count_365	1344	OriginalMostDistance_Cardnum_Merch_zip_actual/median_14
1296	Amount_Merchnum_actual/sum_0	1345	OriginalMostIndDistance_Merchnum_actual/median_14
1297	OriginalMostDistance_Cardnum_Merchnum_actual/median_30	1346	OriginalMostDistance_Cardnum_Merch_description_actual/median_14
1298	OriginalMostDistance_Cardnum_Merch_description_actual/median_30	1347	OriginalMostDistance_Cardnum_actual/median_30
1299	OriginalMostDistance_Cardnum_Industry_actual/median_30	1348	OriginalMostDistance_Merchnum_actual/median_14
1300	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_14	1349	OriginalMostDistance_Cardnum_Merchnum_actual/median_14
1301	OriginalMostIndDistance_Cardnum_Merch_zip_actual/max_14	1350	OriginalMostDistance_Cardnum_actual/median_180
1302	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_14	1351	OriginalMostDistance_Cardnum_actual/median_365
1303	OriginalMostDistance_Cardnum_Merch_zip_actual/sum_14	1352	Amount_Cardnum_Merchnum_actual/sum_180
1304	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_14	1353	OriginalMostIndDistance_Cardnum_Merch_state_actual/sum_7
1305	OriginalMostDistance_Cardnum_Merch_zip_actual/max_14	1354	OriginalMostIndDistance_Cardnum_Merch_state_actual/max_7
1306	OriginalMostDistance_Cardnum_Merch_zip_actual/mean_14	1355	OriginalMostIndDistance_Cardnum_Merch_state_actual/mean_7
1307	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_14	1356	OriginalMostDistance_Cardnum_actual/median_14
1308	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_14	1357	OriginalMostIndDistance_Cardnum_sum_365
1309	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_14	1358	OriginalMostDistance_Cardnum_Merch_state_actual/mean_7
1310	OriginalMostIndDistance_Merchnum_actual/median_30	1359	OriginalMostDistance_Cardnum_Merch_state_actual/max_7
1311	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_14	1360	OriginalMostDistance_Cardnum_Merch_state_actual/sum_7
1312	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_14	1361	Amount_Cardnum_Merchnum_actual/sum_365
1313	OriginalMostIndDistance_Merchnum_actual/median_365	1362	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_7
1314	OriginalMostDistance_Cardnum_Merch_description_actual/sum_14	1363	OriginalMostIndDistance_Cardnum_Merch_zip_actual/max_7
1315	OriginalMostDistance_Cardnum_Merch_description_actual/mean_14	1364	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_7
1316	OriginalMostDistance_Cardnum_Merch_description_actual/max_14	1365	OriginalMostDistance_Cardnum_sum_365
1317	OriginalMostDistance_Cardnum_Merchnum_actual/sum_14	1366	OriginalMostIndDistance_Cardnum_Merch_mean_30
1318	OriginalMostDistance_Cardnum_Merchnum_actual/max_14	1367	OriginalMostIndDistance_Cardnum_Merch_zip_sum_30
1319	OriginalMostDistance_Cardnum_Merchnum_actual/mean_14	1368	OriginalMostIndDistance_Cardnum_Merch_max_30
1320	Amount_Cardnum_count_365	1369	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_7
1321	OriginalMostDistance_Cardnum_count_365	1370	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_7
1322	OriginalMostIndDistance_Cardnum_count_365	1371	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_7
1323	OriginalMostIndDistance_Cardnum_Merch_state_actual/median_14	1372	OriginalMostIndDistance_Cardnum_Merch_state_actual/median_7

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1373	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_7	1422	OriginalMostDistance_Cardnum_Merch state_median_180
1374	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_7	1423	OriginalMostDistance_Cardnum_Merchnum_mean_30
1375	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_7	1424	OriginalMostDistance_Cardnum_Merchnum_sum_30
1376	OriginalMostDistance_Cardnum_Merch zip_actual/max_7	1425	OriginalMostDistance_Cardnum_Merchnum_max_30
1377	OriginalMostDistance_Cardnum_Merch zip_actual/sum_7	1426	OriginalMostIndDistance_Cardnum_Merch_description_median_365
1378	OriginalMostDistance_Cardnum_Merch zip_actual/mean_7	1427	OriginalMostIndDistance_Cardnum_Industry_median_180
1379	OriginalMostDistance_Cardnum_max_365	1428	OriginalMostIndDistance_Cardnum_Merch state_max_14
1380	OriginalMostDistance_Cardnum_Merch zip_sum_30	1429	OriginalMostIndDistance_Cardnum_Merch state_mean_14
1381	OriginalMostDistance_Cardnum_Merch zip_max_30	1430	OriginalMostIndDistance_Cardnum_Merch state_sum_14
1382	OriginalMostDistance_Cardnum_Merch zip_mean_30	1431	OriginalMostIndDistance_Cardnum_Merchnum_median_365
1383	OriginalMostDistance_Cardnum_Merchnum_actual/sum_7	1432	OriginalMostDistance_Cardnum_Merch zip_median_365
1384	OriginalMostDistance_Cardnum_Merch_description_actual/sum_7	1433	OriginalMostDistance_Cardnum_Merch state_sum_14
1385	OriginalMostDistance_Cardnum_Merchnum_actual/mean_7	1434	OriginalMostDistance_Cardnum_Merch state_max_14
1386	OriginalMostDistance_Cardnum_Merch_description_actual/mean_7	1435	OriginalMostDistance_Cardnum_Merch state_mean_14
1387	OriginalMostDistance_Cardnum_Merchnum_actual/max_7	1436	OriginalMostIndDistance_Cardnum_Merch_description_median_180
1388	OriginalMostDistance_Cardnum_Merch_description_actual/max_7	1437	OriginalMostIndDistance_Cardnum_Merchnum_median_180
1389	OriginalMostIndDistance_Cardnum_max_365	1438	OriginalMostDistance_Cardnum_Merch_description_median_365
1390	OriginalMostIndDistance_Cardnum_Merch_description_sum_30	1439	OriginalMostDistance_Merchnum_mean_365
1391	OriginalMostIndDistance_Cardnum_Merch_description_max_30	1440	OriginalMostDistance_Cardnum_Industry_count_0_by_30
1392	OriginalMostIndDistance_Cardnum_Merch_description_mean_30	1441	OriginalMostIndDistance_Cardnum_Industry_count_0_by_30
1393	OriginalMostIndDistance_Cardnum_Merch state_count_180	1442	Amount_Cardnum_Industry_count_0_by_30
1394	OriginalMostDistance_Cardnum_Merch state_count_180	1443	OriginalMostDistance_Cardnum_Merch zip_median_180
1395	Amount_Cardnum_Merch state_count_180	1444	OriginalMostDistance_Cardnum_Merchnum_median_365
1396	OriginalMostIndDistance_Cardnum_Industry_actual/median_7	1445	OriginalMostDistance_Cardnum_Merch_description_median_180
1397	OriginalMostIndDistance_Cardnum_actual/median_7	1446	OriginalMostDistance_Cardnum_Industry_median_365
1398	OriginalMostIndDistance_Merchnum_actual/median_7	1447	OriginalMostDistance_Cardnum_Merchnum_median_180
1399	OriginalMostDistance_Cardnum_actual/median_7	1448	OriginalMostDistance_Cardnum_Industry_median_180
1400	OriginalMostDistance_Merchnum_actual/median_7	1449	OriginalMostIndDistance_Merchnum_sum_7
1401	OriginalMostIndDistance_Cardnum_Merch state_median_365	1450	OriginalMostIndDistance_Merchnum_max_7
1402	OriginalMostIndDistance_Cardnum_Merch zip_actual/median_7	1451	OriginalMostIndDistance_Merchnum_mean_7
1403	OriginalMostDistance_Cardnum_Merch state_actual/median_7	1452	OriginalMostDistance_Merchnum_max_7
1404	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_7	1453	OriginalMostDistance_Merchnum_mean_7
1405	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_7	1454	OriginalMostDistance_Merchnum_sum_7
1406	OriginalMostDistance_Cardnum_Industry_actual/median_7	1455	OriginalMostIndDistance_Cardnum_Merch state_median_30
1407	OriginalMostDistance_Cardnum_Merch zip_actual/median_7	1456	OriginalMostIndDistance_Merchnum_median_365
1408	Amount_Cardnum_actual/sum_14	1457	OriginalMostIndDistance_Merchnum_median_180
1409	OriginalMostDistance_Cardnum_Merchnum_actual/median_7	1458	OriginalMostDistance_Cardnum_Merch state_median_30
1410	OriginalMostDistance_Cardnum_Merch_description_actual/median_7	1459	OriginalMostIndDistance_Cardnum_Industry_median_30
1411	OriginalMostIndDistance_Cardnum_Merch state_median_180	1460	OriginalMostIndDistance_Cardnum_Merch state_actual/mean_3
1412	OriginalMostIndDistance_Cardnum_Merchnum_max_30	1461	OriginalMostIndDistance_Cardnum_Merch state_actual/sum_0
1413	OriginalMostIndDistance_Cardnum_Merchnum_sum_30	1462	OriginalMostIndDistance_Cardnum_Merch state_actual/median_3
1414	OriginalMostIndDistance_Cardnum_Merchnum_mean_30	1463	OriginalMostDistance_Cardnum_actual/mean_1
1415	OriginalMostIndDistance_Cardnum_Merch zip_median_365	1464	OriginalMostIndDistance_Cardnum_Merch state_actual/max_3
1416	OriginalMostDistance_Cardnum_Merch state_median_365	1465	OriginalMostDistance_Cardnum_actual/max_0
1417	OriginalMostIndDistance_Cardnum_Merch zip_median_180	1466	OriginalMostIndDistance_Cardnum_Merch state_actual/sum_1
1418	OriginalMostIndDistance_Cardnum_Industry_median_365	1467	OriginalMostIndDistance_Cardnum_Merch state_actual/sum_3
1419	OriginalMostDistance_Cardnum_Merch_description_mean_30	1468	OriginalMostDistance_Cardnum_actual/median_0
1420	OriginalMostDistance_Cardnum_Merch_description_sum_30	1469	OriginalMostDistance_Cardnum_actual/mean_0
1421	OriginalMostDistance_Cardnum_Merch_description_max_30	1470	OriginalMostIndDistance_Cardnum_Merch state_actual/mean_1

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1471	OriginalMostIndDistance_Cardnum_Merch state_actual/median_1	1520	OriginalMostIndDistance_Cardnum_actual/max_0
1472	OriginalMostDistance_Cardnum_actual/sum_0	1521	OriginalMostIndDistance_Cardnum_actual/mean_0
1473	OriginalMostIndDistance_Cardnum_Merch state_actual/median_0	1522	OriginalMostDistance_Cardnum_Merch state_actual/sum_3
1474	OriginalMostIndDistance_Cardnum_Merch state_actual/max_1	1523	OriginalMostDistance_Cardnum_Merch state_actual/median_3
1475	OriginalMostIndDistance_Cardnum_Merch zip_actual/max_0	1524	OriginalMostDistance_Cardnum_Merch_description_actual/mean_3
1476	OriginalMostIndDistance_Cardnum_Merch state_actual/max_0	1525	OriginalMostDistance_Cardnum_Merch_description_actual/sum_1
1477	OriginalMostDistance_Cardnum_Merch state_actual/sum_1	1526	OriginalMostDistance_Cardnum_Merch_description_actual/median_1
1478	OriginalMostDistance_Cardnum_Merch state_actual/max_1	1527	OriginalMostDistance_Cardnum_Merch_description_actual/max_1
1479	OriginalMostDistance_Cardnum_Merch state_actual/mean_1	1528	OriginalMostDistance_Cardnum_Merchnum_actual/mean_1
1480	OriginalMostDistance_Cardnum_Merch state_actual/sum_0	1529	OriginalMostDistance_Cardnum_Merchnum_actual/sum_0
1481	OriginalMostDistance_Cardnum_Merch state_actual/median_0	1530	OriginalMostDistance_Cardnum_Merchnum_actual/median_0
1482	OriginalMostDistance_Cardnum_Merch state_actual/max_0	1531	OriginalMostDistance_Cardnum_Merchnum_actual/max_0
1483	OriginalMostDistance_Cardnum_Merch state_actual/mean_0	1532	OriginalMostDistance_Cardnum_Merchnum_actual/mean_0
1484	OriginalMostDistance_Cardnum_Industry_actual/sum_3	1533	OriginalMostDistance_Merchnum_actual/sum_3
1485	OriginalMostDistance_Cardnum_Industry_actual/median_3	1534	OriginalMostDistance_Merchnum_actual/median_3
1486	OriginalMostDistance_Cardnum_Industry_actual/max_3	1535	OriginalMostDistance_Merchnum_actual/max_3
1487	OriginalMostDistance_Cardnum_Industry_actual/mean_3	1536	OriginalMostDistance_Merchnum_actual/mean_3
1488	OriginalMostDistance_Cardnum_Industry_actual/sum_1	1537	OriginalMostDistance_Merchnum_actual/sum_1
1489	OriginalMostDistance_Cardnum_Industry_actual/median_1	1538	LONG_mostind
1490	OriginalMostDistance_Cardnum_Industry_actual/max_1	1539	OriginalMostDistance_Merchnum_actual/median_1
1491	OriginalMostDistance_Cardnum_Industry_actual/mean_1	1540	LAT_mostind
1492	OriginalMostDistance_Cardnum_Industry_actual/sum_0	1541	OriginalMostDistance_Merchnum_actual/max_1
1493	OriginalMostDistance_Cardnum_Industry_actual/median_0	1542	LONG_most
1494	OriginalMostDistance_Cardnum_Industry_actual/max_0	1543	OriginalMostDistance_Merchnum_actual/mean_1
1495	OriginalMostDistance_Cardnum_Industry_actual/mean_0	1544	OriginalMostDistance_Merchnum_actual/sum_0
1496	OriginalMostDistance_Cardnum_Merch_description_actual/sum_3	1545	OriginalMostDistance_Merchnum_actual/median_0
1497	OriginalMostDistance_Cardnum_Merch_description_actual/median_3	1546	LAT_most
1498	OriginalMostDistance_Cardnum_Merch_description_actual/max_3	1547	OriginalMostDistance_Merchnum_actual/max_0
1499	OriginalMostDistance_Cardnum_Merch state_actual/median_1	1548	OriginalMostDistance_Merchnum_actual/mean_0
1500	OriginalMostDistance_Cardnum_Merch state_actual/mean_3	1549	OriginalMostDistance_Cardnum_Merchnum_actual/max_1
1501	OriginalMostIndDistance_Merchnum_actual/mean_3	1550	OriginalMostDistance_Cardnum_Merchnum_actual/median_1
1502	OriginalMostDistance_Cardnum_Merch state_actual/max_3	1551	OriginalMostDistance_Cardnum_Merchnum_actual/sum_1
1503	OriginalMostIndDistance_Merchnum_actual/median_1	1552	OriginalMostDistance_Cardnum_Merch zip_actual/sum_1
1504	OriginalMostIndDistance_Merchnum_actual/max_1	1553	OriginalMostDistance_Cardnum_Merch_description_actual/mean_1
1505	OriginalMostIndDistance_Merchnum_actual/mean_1	1554	OriginalMostDistance_Cardnum_Merch_description_actual/sum_0
1506	OriginalMostIndDistance_Merchnum_actual/sum_0	1555	OriginalMostDistance_Cardnum_Merch_description_actual/median_0
1507	OriginalMostIndDistance_Merchnum_actual/median_0	1556	OriginalMostDistance_Cardnum_Merch_description_actual/max_0
1508	OriginalMostIndDistance_Merchnum_actual/max_0	1557	OriginalMostDistance_Cardnum_Merch_description_actual/mean_0
1509	OriginalMostIndDistance_Merchnum_actual/mean_0	1558	OriginalMostDistance_Cardnum_Merch zip_actual/sum_3
1510	OriginalMostIndDistance_Cardnum_actual/sum_3	1559	OriginalMostDistance_Cardnum_Merch zip_actual/median_3
1511	OriginalMostIndDistance_Cardnum_actual/median_3	1560	OriginalMostDistance_Cardnum_Merch zip_actual/max_3
1512	OriginalMostIndDistance_Cardnum_actual/max_3	1561	OriginalMostDistance_Cardnum_Merch zip_actual/mean_3
1513	OriginalMostIndDistance_Cardnum_actual/mean_3	1562	OriginalMostDistance_Cardnum_Merch zip_actual/median_1
1514	OriginalMostIndDistance_Cardnum_actual/sum_1	1563	OriginalMostDistance_Cardnum_Merchnum_actual/mean_3
1515	OriginalMostIndDistance_Cardnum_actual/median_1	1564	OriginalMostDistance_Cardnum_Merch zip_actual/max_1
1516	OriginalMostIndDistance_Cardnum_actual/max_1	1565	OriginalMostDistance_Cardnum_Merch zip_actual/mean_1
1517	OriginalMostIndDistance_Cardnum_Merch state_actual/mean_0	1566	OriginalMostDistance_Cardnum_Merch zip_actual/sum_0
1518	OriginalMostIndDistance_Cardnum_actual/sum_0	1567	OriginalMostDistance_Cardnum_Merch zip_actual/median_0
1519	OriginalMostIndDistance_Cardnum_actual/median_0	1568	OriginalMostDistance_Cardnum_Merch zip_actual/max_0

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1569	OriginalMostDistance_Cardnum_Merch_zip_actual/mean_0	1618	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_3
1570	OriginalMostDistance_Cardnum_Merchnum_actual/sum_3	1619	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_3
1571	OriginalMostDistance_Cardnum_Merchnum_actual/median_3	1620	OriginalMostIndDistance_Cardnum_Industry_actual/max_3
1572	OriginalMostDistance_Cardnum_Merchnum_actual/max_3	1621	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_0
1573	OriginalMostIndDistance_Merchnum_actual/sum_1	1622	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_0
1574	OriginalMostIndDistance_Cardnum_actual/mean_1	1623	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_3
1575	OriginalMostIndDistance_Merchnum_actual/max_3	1624	OriginalMostIndDistance_Cardnum_Industry_actual/mean_1
1576	OriginalMostIndDistance_Cardnum_Industry_actual/max_0	1625	OriginalMostIndDistance_Cardnum_Industry_actual/sum_0
1577	OriginalMostDistance_Cardnum_actual/median_1	1626	OriginalMostIndDistance_Cardnum_Industry_actual/median_3
1578	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_0	1627	OriginalMostIndDistance_Cardnum_Industry_actual/sum_3
1579	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_0	1628	OriginalMostDistance_Cardnum_actual/max_1
1580	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_0	1629	OriginalMostIndDistance_Cardnum_Industry_actual/median_0
1581	OriginalMostDistance_Cardnum_actual/sum_1	1630	OriginalMostIndDistance_Merchnum_actual/sum_3
1582	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_3	1631	OriginalMostIndDistance_Cardnum_Industry_actual/median_1
1583	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_3	1632	OriginalMostDistance_Merchnum_median_365
1584	OriginalMostDistance_Cardnum_actual/sum_3	1633	OriginalMostDistance_Merchnum_median_180
1585	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_1	1634	OriginalMostIndDistance_Cardnum_Merch_zip_median_30
1586	OriginalMostIndDistance_Cardnum_Merch_zip_actual/max_1	1635	OriginalMostIndDistance_Cardnum_Merchnum_median_30
1587	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_1	1636	OriginalMostIndDistance_Cardnum_Merch_description_median_30
1588	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_1	1637	OriginalMostIndDistance_Cardnum_max_7
1589	OriginalMostIndDistance_Cardnum_Merch_zip_actual/mean_3	1638	OriginalMostIndDistance_Cardnum_mean_7
1590	OriginalMostIndDistance_Cardnum_Merch_zip_actual/max_3	1639	OriginalMostIndDistance_Cardnum_sum_7
1591	OriginalMostIndDistance_Cardnum_Merch_zip_actual/median_3	1640	OriginalMostDistance_Cardnum_Merch_zip_median_30
1592	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_3	1641	OriginalMostDistance_Cardnum_mean_7
1593	OriginalMostIndDistance_Cardnum_Merch_zip_actual/sum_3	1642	OriginalMostDistance_Cardnum_max_7
1594	OriginalMostDistance_Cardnum_actual/median_3	1643	OriginalMostDistance_Cardnum_sum_7
1595	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_3	1644	OriginalMostDistance_Cardnum_Merchnum_median_30
1596	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_1	1645	OriginalMostDistance_Cardnum_Merch_zip_max_14
1597	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_1	1646	OriginalMostIndDistance_Cardnum_Merch_description_max_14
1598	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_1	1647	OriginalMostDistance_Cardnum_Merch_zip_sum_14
1599	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_1	1648	OriginalMostDistance_Cardnum_Merch_zip_mean_14
1600	OriginalMostDistance_Cardnum_actual/mean_3	1649	OriginalMostIndDistance_Cardnum_Merch_description_mean_14
1601	OriginalMostIndDistance_Cardnum_Merch_description_actual/sum_0	1650	OriginalMostIndDistance_Cardnum_Merch_description_sum_14
1602	OriginalMostIndDistance_Cardnum_Merch_description_actual/median_0	1651	OriginalMostIndDistance_Merchnum_median_30
1603	OriginalMostIndDistance_Cardnum_Merch_description_actual/max_0	1652	OriginalMostIndDistance_Cardnum_Merchnum_max_14
1604	OriginalMostIndDistance_Merchnum_actual/median_3	1653	OriginalMostIndDistance_Cardnum_Merchnum_mean_14
1605	OriginalMostIndDistance_Cardnum_Merch_description_actual/mean_0	1654	OriginalMostIndDistance_Cardnum_Merchnum_sum_14
1606	OriginalMostIndDistance_Cardnum_Industry_actual/mean_0	1655	OriginalMostDistance_Cardnum_Merch_description_sum_14
1607	OriginalMostDistance_Cardnum_actual/max_3	1656	OriginalMostDistance_Cardnum_Merch_description_max_14
1608	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_0	1657	OriginalMostDistance_Cardnum_Merch_description_mean_14
1609	OriginalMostIndDistance_Cardnum_Industry_actual/max_1	1658	OriginalMostDistance_Cardnum_Merchnum_mean_14
1610	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_0	1659	OriginalMostDistance_Cardnum_Merchnum_sum_14
1611	OriginalMostIndDistance_Cardnum_Industry_actual/sum_1	1660	OriginalMostDistance_Cardnum_Merchnum_max_14
1612	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_1	1661	OriginalMostIndDistance_Cardnum_Merch_state_median_14
1613	OriginalMostIndDistance_Cardnum_Merchnum_actual/max_1	1662	OriginalMostIndDistance_Cardnum_Industry_median_14
1614	OriginalMostIndDistance_Cardnum_Merchnum_actual/median_1	1663	OriginalMostDistance_Merchnum_median_30
1615	OriginalMostIndDistance_Cardnum_Merchnum_actual/sum_1	1664	OriginalMostDistance_Cardnum_Merch_description_median_30
1616	OriginalMostIndDistance_Cardnum_Industry_actual/mean_3	1665	OriginalMostDistance_Cardnum_Industry_median_30
1617	OriginalMostIndDistance_Cardnum_Merchnum_actual/mean_3	1666	OriginalMostIndDistance_Cardnum_median_30

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1667	OriginalMostIndDistance_Cardnum_Industry_mean_7	1716	OriginalMostIndDistance_Cardnum_Merchnum_median_7
1668	OriginalMostIndDistance_Cardnum_Industry_max_7	1717	OriginalMostIndDistance_Cardnum_Merch_description_median_7
1669	OriginalMostIndDistance_Cardnum_Industry_sum_7	1718	OriginalMostDistance_Cardnum_Industry_median_7
1670	OriginalMostIndDistance_Cardnum_Merch_zip_sum_14	1719	OriginalMostDistance_Cardnum_Merch_zip_median_7
1671	OriginalMostIndDistance_Cardnum_Merch_zip_mean_14	1720	OriginalMostDistance_Cardnum_Merch_description_median_7
1672	OriginalMostIndDistance_Cardnum_Merch_zip_max_14	1721	OriginalMostDistance_Cardnum_Merchnum_median_7
1673	OriginalMostDistance_Cardnum_Industry_mean_7	1722	OriginalMostDistance_Cardnum_median_365
1674	OriginalMostDistance_Cardnum_Industry_max_7	1723	OriginalMostDistance_Cardnum_median_180
1675	OriginalMostDistance_Cardnum_Industry_sum_7	1724	OriginalMostIndDistance_Cardnum_Merch_state_max_7
1676	OriginalMostDistance_Cardnum_Merch_state_median_14	1725	OriginalMostIndDistance_Cardnum_Merch_state_mean_7
1677	OriginalMostIndDistance_Cardnum_median_365	1726	OriginalMostIndDistance_Cardnum_Merch_state_sum_7
1678	OriginalMostIndDistance_Cardnum_median_180	1727	OriginalMostDistance_Cardnum_median_14
1679	OriginalMostIndDistance_Cardnum_Merch_zip_median_14	1728	OriginalMostDistance_Cardnum_Merch_state_sum_7
1680	OriginalMostIndDistance_Cardnum_Merch_description_median_14	1729	OriginalMostDistance_Cardnum_Merch_state_mean_7
1681	OriginalMostDistance_Cardnum_Industry_median_14	1730	OriginalMostDistance_Cardnum_Merch_state_max_7
1682	OriginalMostIndDistance_Cardnum_median_14	1731	OriginalMostDistance_Cardnum_Industry_sum_3
1683	OriginalMostIndDistance_Cardnum_Merchnum_median_14	1732	OriginalMostDistance_Cardnum_Industry_median_3
1684	OriginalMostIndDistance_Cardnum_median_14	1733	OriginalMostDistance_Cardnum_Industry_max_3
1685	OriginalMostDistance_Cardnum_Merch_zip_median_14	1734	OriginalMostDistance_Cardnum_Industry_mean_3
1686	OriginalMostDistance_Cardnum_Merch_description_median_14	1735	OriginalMostDistance_Cardnum_Industry_sum_1
1687	OriginalMostDistance_Cardnum_median_30	1736	OriginalMostDistance_Cardnum_Industry_median_1
1688	OriginalMostDistance_Merchnum_median_14	1737	OriginalMostDistance_Cardnum_Industry_max_1
1689	OriginalMostIndDistance_Cardnum_Merchnum_median_14	1738	OriginalMostDistance_Cardnum_Industry_mean_1
1690	OriginalMostIndDistance_Cardnum_Merch_zip_mean_7	1739	OriginalMostDistance_Cardnum_Merchnum_count_3_by_3
1691	OriginalMostIndDistance_Cardnum_Merch_zip_max_7	1740	OriginalMostDistance_Cardnum_Merch_state_median_0
1692	OriginalMostIndDistance_Cardnum_Merch_zip_sum_7	1741	OriginalMostIndDistance_Cardnum_Merch_zip_count_3_by_3
1693	OriginalMostIndDistance_Cardnum_Merchnum_sum_7	1742	OriginalMostDistance_Cardnum_Industry_sum_0
1694	OriginalMostIndDistance_Cardnum_Merchnum_max_7	1743	OriginalMostDistance_Cardnum_Industry_median_0
1695	OriginalMostIndDistance_Cardnum_Merch_description_max_7	1744	OriginalMostDistance_Cardnum_Industry_max_0
1696	OriginalMostIndDistance_Cardnum_Merch_description_sum_7	1745	OriginalMostDistance_Cardnum_Industry_mean_0
1697	OriginalMostIndDistance_Cardnum_Merch_state_median_7	1746	OriginalMostDistance_Cardnum_Merch_description_sum_3
1698	OriginalMostIndDistance_Cardnum_Merch_description_mean_7	1747	OriginalMostDistance_Cardnum_Merch_description_median_3
1699	OriginalMostIndDistance_Cardnum_Merchnum_mean_7	1748	OriginalMostDistance_Cardnum_Merch_description_max_3
1700	OriginalMostDistance_Cardnum_Merch_zip_sum_7	1749	OriginalMostDistance_Cardnum_Merch_description_mean_3
1701	OriginalMostDistance_Cardnum_Merch_zip_max_7	1750	OriginalMostDistance_Cardnum_Merch_description_sum_1
1702	OriginalMostDistance_Cardnum_Merch_zip_mean_7	1751	OriginalMostDistance_Cardnum_Merch_state_max_0
1703	OriginalMostDistance_Cardnum_Merch_description_mean_7	1752	OriginalMostDistance_Cardnum_Merch_state_median_1
1704	OriginalMostDistance_Cardnum_Merch_description_max_7	1753	OriginalMostDistance_Cardnum_Merch_state_sum_0
1705	OriginalMostDistance_Cardnum_Merch_description_sum_7	1754	OriginalMostDistance_Cardnum_Merch_state_mean_1
1706	OriginalMostDistance_Cardnum_Merchnum_max_7	1755	OriginalMostIndDistance_Cardnum_median_3
1707	OriginalMostDistance_Cardnum_Merchnum_sum_7	1756	OriginalMostIndDistance_Cardnum_max_3
1708	OriginalMostDistance_Cardnum_Merchnum_mean_7	1757	OriginalMostIndDistance_Cardnum_mean_3
1709	OriginalMostIndDistance_Cardnum_median_7	1758	OriginalMostIndDistance_Cardnum_sum_1
1710	OriginalMostIndDistance_Cardnum_Industry_median_7	1759	OriginalMostIndDistance_Cardnum_median_1
1711	OriginalMostDistance_Cardnum_median_7	1760	OriginalMostIndDistance_Cardnum_max_1
1712	OriginalMostIndDistance_Merchnum_median_7	1761	OriginalMostIndDistance_Cardnum_mean_1
1713	OriginalMostDistance_Merchnum_median_7	1762	OriginalMostIndDistance_Cardnum_sum_0
1714	OriginalMostDistance_Cardnum_Merch_state_median_7	1763	OriginalMostIndDistance_Cardnum_median_0
1715	OriginalMostIndDistance_Cardnum_Merch_zip_median_7	1764	OriginalMostIndDistance_Cardnum_max_0

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1765	OriginalMostIndDistance_Cardnum_mean_0	1814	OriginalMostDistance_Cardnum_Merch zip_mean_1
1766	OriginalMostDistance_Cardnum_Merch state_sum_3	1815	OriginalMostDistance_Cardnum_Merch zip_sum_0
1767	OriginalMostDistance_Cardnum_Merch state_median_3	1816	OriginalMostDistance_Cardnum_Merch zip_median_0
1768	OriginalMostIndDistance_Cardnum_Merchnum_count_3_by_3	1817	OriginalMostDistance_Cardnum_Merch zip_max_0
1769	OriginalMostDistance_Cardnum_Merch state_max_3	1818	OriginalMostDistance_Cardnum_Merch zip_mean_0
1770	OriginalMostDistance_Cardnum_Merch state_mean_3	1819	OriginalMostDistance_Cardnum_Merchnum_sum_3
1771	OriginalMostDistance_Cardnum_Merch state_sum_1	1820	OriginalMostDistance_Cardnum_Merchnum_median_3
1772	OriginalMostDistance_Cardnum_Merch_description_max_1	1821	OriginalMostDistance_Cardnum_Merchnum_max_3
1773	OriginalMostDistance_Cardnum_Merch state_max_1	1822	OriginalMostDistance_Cardnum_Merchnum_mean_3
1774	OriginalMostDistance_Cardnum_Merch_description_median_1	1823	OriginalMostIndDistance_Merchnum_count_3_by_3
1775	OriginalMostDistance_Cardnum_Merch_description_median_0	1824	OriginalMostIndDistance_Merchnum_max_0
1776	OriginalMostDistance_Cardnum_Merch_description_mean_1	1825	OriginalMostIndDistance_Merchnum_mean_0
1777	OriginalMostDistance_Cardnum_Merch_description_sum_0	1826	OriginalMostIndDistance_Cardnum_Merch state_median_0
1778	OriginalMostDistance_Cardnum_Merchnum_mean_1	1827	OriginalMostIndDistance_Cardnum_Merch state_mean_0
1779	IndMostDistance	1828	OriginalMostDistance_Cardnum_Merch_description_count_3_by_3
1780	OriginalMostDistance_Cardnum_Merchnum_sum_0	1829	OriginalMostDistance_Cardnum_max_1
1781	OriginalMostIndDistance	1830	OriginalMostIndDistance_Cardnum_Industry_sum_3
1782	OriginalMostDistance	1831	OriginalMostIndDistance_Cardnum_Industry_median_3
1783	OriginalMostDistance_Cardnum_Merchnum_median_0	1832	OriginalMostIndDistance_Cardnum_Industry_max_3
1784	OriginalMostDistance_Cardnum_Merchnum_max_0	1833	OriginalMostIndDistance_Cardnum_Industry_mean_3
1785	OriginalMostDistance_Cardnum_Merchnum_mean_0	1834	OriginalMostIndDistance_Cardnum_Industry_sum_1
1786	OriginalMostDistance_Merchnum_sum_3	1835	OriginalMostIndDistance_Cardnum_Industry_median_1
1787	OriginalMostDistance_Merchnum_median_3	1836	OriginalMostIndDistance_Cardnum_Industry_max_1
1788	OriginalMostDistance_Merchnum_max_3	1837	OriginalMostIndDistance_Cardnum_Industry_mean_1
1789	OriginalMostDistance_Merchnum_mean_3	1838	OriginalMostDistance_Cardnum_median_1
1790	OriginalMostDistance_Merchnum_sum_1	1839	OriginalMostIndDistance_Cardnum_Industry_sum_0
1791	OriginalMostDistance_Merchnum_median_1	1840	OriginalMostIndDistance_Cardnum_Industry_median_0
1792	OriginalMostDistance_Merchnum_max_1	1841	OriginalMostIndDistance_Cardnum_Industry_max_0
1793	OriginalMostIndDistance_Cardnum_Merch state_count_3_by_3	1842	OriginalMostIndDistance_Cardnum_Industry_mean_0
1794	OriginalMostDistance_Merchnum_mean_1	1843	OriginalMostDistance_Cardnum_sum_1
1795	OriginalMostDistance_Merchnum_sum_0	1844	OriginalMostIndDistance_Cardnum_Merch_description_sum_3
1796	OriginalMostDistance_Merchnum_median_0	1845	OriginalMostIndDistance_Cardnum_Merch_description_median_3
1797	OriginalMostDistance_Merchnum_max_0	1846	OriginalMostDistance_Cardnum_Industry_count_3_by_3
1798	OriginalMostDistance_Merchnum_mean_0	1847	OriginalMostIndDistance_Cardnum_Merch_description_max_3
1799	OriginalMostDistance_Cardnum_Merchnum_max_1	1848	OriginalMostIndDistance_Cardnum_Merch state_max_0
1800	OriginalMostDistance_Cardnum_Merchnum_median_1	1849	OriginalMostIndDistance_Cardnum_Merch state_sum_0
1801	OriginalMostIndDistance_Cardnum_Industry_count_3_by_3	1850	OriginalMostDistance_Merchnum_count_3_by_3
1802	OriginalMostDistance_Cardnum_Merch zip_median_1	1851	OriginalMostIndDistance_Cardnum_Merch state_mean_1
1803	OriginalMostIndDistance_Cardnum_sum_3	1852	OriginalMostDistance_Cardnum_count_3_by_3
1804	OriginalMostDistance_Cardnum_Merch_description_max_0	1853	Amount_Cardnum_Merch state_count_3_by_3
1805	OriginalMostDistance_Cardnum_Merch_description_mean_0	1854	Amount_Cardnum_Industry_count_3_by_3
1806	OriginalMostIndDistance_Cardnum_Merch_description_count_3_by_3	1855	Amount_Cardnum_Merch_description_count_3_by_3
1807	OriginalMostDistance_Cardnum_Merch zip_sum_3	1856	Amount_Cardnum_Merch zip_count_3_by_3
1808	OriginalMostDistance_Cardnum_Merch zip_median_3	1857	Amount_Cardnum_Merchnum_count_3_by_3
1809	OriginalMostDistance_Cardnum_Merch zip_max_3	1858	Amount_Merchnum_count_3_by_3
1810	OriginalMostDistance_Cardnum_Merch zip_mean_3	1859	OriginalMostDistance_Cardnum_mean_0
1811	OriginalMostDistance_Cardnum_Merch zip_sum_1	1860	Amount_Cardnum_count_3_by_3
1812	OriginalMostDistance_Cardnum_Merch zip_max_1	1861	OriginalMostDistance_Cardnum_max_0
1813	OriginalMostDistance_Cardnum_Merchnum_sum_1	1862	OriginalMostDistance_Cardnum_median_0

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1863	OriginalMostDistance_Cardnum_Merch zip_count_3_by_3	1912	OriginalMostIndDistance_Cardnum_Merch zip_max_0
1864	OriginalMostDistance_Cardnum_sum_0	1913	OriginalMostIndDistance_Cardnum_Merch zip_mean_3
1865	OriginalMostIndDistance_Cardnum_Merch state_sum_3	1914	OriginalMostDistance_Cardnum_Merch state_count_3_by_3
1866	OriginalMostIndDistance_Cardnum_Merch state_median_3	1915	OriginalMostDistance_Cardnum_sum_3
1867	OriginalMostIndDistance_Cardnum_Merch state_max_3	1916	OriginalMostIndDistance_Cardnum_Merch zip_sum_1
1868	OriginalMostIndDistance_Cardnum_Merch state_mean_3	1917	OriginalMostIndDistance_Cardnum_Merch zip_median_1
1869	OriginalMostDistance_Cardnum_mean_1	1918	OriginalMostIndDistance_Cardnum_Merch zip_max_1
1870	OriginalMostIndDistance_Cardnum_Merch state_sum_1	1919	OriginalMostIndDistance_Cardnum_Merch zip_mean_1
1871	OriginalMostIndDistance_Cardnum_Merch state_median_1	1920	OriginalMostIndDistance_Cardnum_Merch zip_sum_0
1872	OriginalMostIndDistance_Cardnum_Merch state_max_1	1921	OriginalMostIndDistance_Cardnum_Merch zip_median_0
1873	OriginalMostIndDistance_Cardnum_Merch_description_mean_3	1922	OriginalMostDistance_Cardnum_Merch state_mean_0
1874	OriginalMostDistance_Cardnum_mean_3		
1875	OriginalMostIndDistance_Cardnum_Merch_description_sum_1		
1876	OriginalMostIndDistance_Cardnum_Merch_description_median_1		
1877	OriginalMostIndDistance_Cardnum_Merchnum_max_3		
1878	OriginalMostIndDistance_Cardnum_Merchnum_mean_3		
1879	OriginalMostIndDistance_Cardnum_Merchnum_sum_1		
1880	OriginalMostIndDistance_Cardnum_Merchnum_median_1		
1881	OriginalMostIndDistance_Cardnum_Merchnum_max_1		
1882	OriginalMostIndDistance_Cardnum_Merchnum_mean_1		
1883	OriginalMostIndDistance_Cardnum_count_3_by_3		
1884	OriginalMostIndDistance_Cardnum_Merchnum_sum_0		
1885	OriginalMostIndDistance_Cardnum_Merchnum_median_0		
1886	OriginalMostIndDistance_Cardnum_Merchnum_max_0		
1887	OriginalMostIndDistance_Cardnum_Merchnum_mean_0		
1888	OriginalMostIndDistance_Merchnum_sum_3		
1889	OriginalMostIndDistance_Merchnum_median_3		
1890	OriginalMostIndDistance_Merchnum_max_3		
1891	OriginalMostIndDistance_Merchnum_mean_3		
1892	OriginalMostIndDistance_Merchnum_sum_1		
1893	OriginalMostIndDistance_Merchnum_median_1		
1894	OriginalMostIndDistance_Merchnum_max_1		
1895	OriginalMostIndDistance_Merchnum_mean_1		
1896	OriginalMostIndDistance_Merchnum_sum_0		
1897	OriginalMostIndDistance_Merchnum_median_0		
1898	OriginalMostIndDistance_Cardnum_Merchnum_median_3		
1899	OriginalMostIndDistance_Cardnum_Merchnum_sum_3		
1900	OriginalMostIndDistance_Cardnum_Merch zip_mean_0		
1901	OriginalMostIndDistance_Cardnum_Merch zip_median_3		
1902	OriginalMostIndDistance_Cardnum_Merch_description_max_1		
1903	OriginalMostIndDistance_Cardnum_Merch_description_mean_1		
1904	OriginalMostIndDistance_Cardnum_Merch_description_sum_0		
1905	OriginalMostIndDistance_Cardnum_Merch_description_median_0		
1906	OriginalMostIndDistance_Cardnum_Merch_description_max_0		
1907	OriginalMostIndDistance_Cardnum_Merch_description_mean_0		
1908	OriginalMostDistance_Cardnum_max_3		
1909	OriginalMostDistance_Cardnum_median_3		
1910	OriginalMostIndDistance_Cardnum_Merch zip_sum_3		
1911	OriginalMostIndDistance_Cardnum_Merch zip_max_3		