



Comprehensive Report on Loan Application Analysis

Emmanuel Kwesi Ocrah

Introduction

This report presents an in-depth analysis of loan application data from Kaggle aimed at identifying the critical factors contributing to loan defaults. The analysis incorporates both current and historical loan data, integrating preprocessing, exploratory, and predictive modeling techniques. The goal is to derive actionable insights to enhance risk management, optimize loan processing, and improve operational efficiency.

Data Sources and Preprocessing

Current Loan Application Data

The primary dataset, referred to as `loan_data`, comprises 307,511 observations and 122 variables. These variables encompass demographic information, financial attributes, loan characteristics, and other relevant applicant details.

- Data Import and Structure:
 - The dataset was imported using the `INFILE` statement in SAS, ensuring proper handling of missing values, standardized formats, and consistent data representation. Financial variables were formatted to two decimal places to maintain accuracy.
 - Initial reviews using `PROC PRINT` and `PROC CONTENTS` confirmed the dataset's structure and completeness.

Historical Loan Data

The secondary dataset, labeled `previous_loan_data`, includes 1,670,214 observations and 37 variables. This dataset provides information on past loans associated with current applicants, detailing contract types, loan amounts, approval statuses, and payment behaviors.

- Data Integration:
 - Historical loan data was aggregated using SQL to calculate two key metrics for each applicant: the total number of previous applications (`previous_apps`) and the number of approved applications (`approved_apps`).
 - The datasets were merged on the common identifier `SK_ID_CURR`, resulting in a comprehensive dataset capturing both current and historical loan information.
- Handling Missing Values:
 - A detailed review of missing data using `PROC MEANS` identified variables with significant proportions of missing values, such as `EXT_SOURCE_1`, `EXT_SOURCE_2`, and `EXT_SOURCE_3`. These variables were critical for deriving credit scores.

Feature Engineering and Transformation

Credit Score Derivation

Three credit score variables—CREDIT_SCORE_1, CREDIT_SCORE_2, and CREDIT_SCORE_3—were derived from external score variables by applying a standard scaling formula to align them with traditional credit score ranges. These derived scores played a pivotal role in subsequent modeling and analysis.

Categorical Data Cleaning

- Missing values in the OCCUPATION_TYPE variable were replaced with "Other," ensuring the dataset's completeness without introducing significant bias.

Financial Variable Transformation

- Key financial variables underwent logarithmic transformations to address skewness and stabilize variance, improving their suitability for regression analysis. These variables included:
 - Log_AMT_INCOME_TOTAL
 - Log_AMT_CREDIT
 - Log_AMT_ANNUITY
 - Log_AMT_GOODS_PRICE

Exploratory Data Analysis (EDA)

Gender and Loan Defaults

- The analysis of gender-based default rates revealed notable differences:
 - Female applicants accounted for 65.83% of all applications, with a default rate of 4.61%.
 - Male applicants represented 34.16% of the dataset and exhibited a slightly higher default rate of 3.46%.

Family Status and Loan Defaults

- Family status emerged as a critical determinant of loan defaults. Married applicants, who comprised 63.88% of the dataset, had a default rate of 4.83%. Conversely, single or not-married applicants, accounting for 14.78% of the dataset, exhibited a default rate of 1.45%.
- Civil marriage and separated statuses also displayed intermediate default rates.

Distribution of Financial Variables

- Log-transformed financial variables were analyzed to understand their distribution:
 - Log_AMT_INCOME_TOTAL:
 - Mean: 11.91
 - Standard Deviation: 0.49
 - Observed a slight positive skew.

- Log_AMT_CREDIT:
 - Mean: 13.07
 - Standard Deviation: 0.72
 - Exhibited a minor negative skew.
- Log_AMT_ANNUITY:
 - Mean: 10.07
 - Standard Deviation: 0.55
 - Demonstrated a normal-like distribution.
- Log_AMT_GOODS_PRICE:
 - Mean: 12.96
 - Standard Deviation: 0.72
 - Displayed slight deviations from normality.
- Goodness-of-fit tests confirmed approximate normality for these variables, with deviations noted for Log_AMT_GOODS_PRICE.

Predictive Modeling

Logistic Regression for Default Prediction

- A binary logistic regression model was employed to predict loan defaults. The model utilized stepwise selection to identify significant predictors.

Variable Selection

- The stepwise selection process retained variables with significant contributions to the model while excluding those with minimal impact. Key variables retained include:
 - Log-transformed financial variables: Log_AMT_CREDIT and Log_AMT_ANNUITY
 - Credit score: CREDIT_SCORE_2.
 - Demographic factors: GENDER, NAME_FAMILY_STATUS, and NAME_EDUCATION_TYPE.
 - Categorical predictors: OCCUPATION_TYPE.
 - Historical metrics: PREVIOUS_APPS and APPROVED_APPS.
- The following variables were removed during the stepwise selection process:
 - NAME_CONTRACT_TYPE: Removed at Step 29 due to low statistical significance (Chi-Square = 0.0083, p = 0.9273).
 - FLAG_DOCUMENT_8: Removed due to its minimal contribution, reflecting low significance in predicting defaults.
 - Other insignificant variables related to operational details, such as certain flags and document-related fields, were excluded as they did not enhance the predictive power of the model.

Model Evaluation

- The model's performance is moderately strong, with a c-statistic of 0.716 and a high percent concordant value. These results suggest that the logistic regression model provides a meaningful and actionable framework for predicting the likelihood of the event

under consideration. However, there is room for improvement, particularly in reducing discordance and enhancing the association metrics.

Insights and Recommendations

Key Findings

1. Gender and Family Status Trends:

Gender and marital status significantly influence default probabilities. Married applicants are less likely to default compared to single or separated applicants.

2. Financial Risk Indicators:

Lower income levels and higher credit amounts correlate with increased default risk. Implementing stricter affordability checks and enhanced income verification can mitigate these risks.

3. Credit Score Significance:

Derived credit scores are critical predictors of defaults. Improving the accuracy and reliability of credit scoring systems will enhance risk assessment capabilities.

4. Historical Loan Behavior:

Applicants with higher numbers of approved historical loans demonstrate lower default rates, indicating reliability and financial stability.

5. Operational Insights:

Loan applications peak on Mondays and Tuesdays. Adjusting staffing levels to align with these peaks can improve operational efficiency and customer satisfaction.

Recommendations

- Develop tailored financial products for high-risk groups, including applicants with lower credit scores or unstable incomes.
- Implement financial literacy programs to educate applicants on credit management and financial planning.
- Enhance risk mitigation strategies by leveraging historical loan data and demographic trends.
- Optimize loan processing workflows to address operational peaks effectively.

Future Directions

1. Advanced Modeling: Employ machine learning techniques, such as random forests or gradient boosting, to enhance prediction accuracy and capture complex interactions between variables.
2. Time-Series Analysis: Investigate temporal trends in loan defaults to uncover seasonal patterns or economic influences.
3. Macroeconomic Analysis: Integrate external economic indicators, such as interest rates and unemployment figures, to provide a holistic understanding of default risks.

Conclusion

This analysis underscores the multifaceted nature of loan defaults, highlighting the interplay between demographic, financial, and historical factors. By leveraging these insights, financial institutions can enhance their risk management frameworks, streamline operations, and implement targeted interventions to reduce defaults while promoting financial inclusion. The findings serve as a robust foundation for informed decision-making and strategic planning.

Program Summary - Loan Default Project.sas

Execution Environment

Author: eocrah
File: C:/Users/eocrah/Documents/My SAS Files/Loan Default Project.sas
SAS Platform: X64_10PRO WIN
SAS Host: RL-119-024 LIB.UA-NET.UA.EDU
SAS Version: 9.04.01M6P11072018
SAS Locale: en_US
Submission Time: 1/18/2025, 3:19:59 PM
Browser Host: RL-119-024
User Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36
Application Server: RL-119-024

Code: Loan Default Project.sas

```
/* Step 1: Read and Preprocess the Raw Data */
data loan_data;
  infile 'C:/Users/eocrah/Documents/application_data.csv' DSD MISOVER
    FIRSTOBS=2 LRECL=32767;
  length SK_ID_CURR 6 LOAN_DEFAULT 3 NAME_CONTRACT_TYPE $15 GENDER $1
    FLAG_OWN_CAR $1 FLAG_OWN_REALTY $1 CNT_CHILDREN 8 AMT_INCOME_TOTAL 8
    AMT_CREDIT 8 AMT_ANNUITY 8 AMT_GOODS_PRICE 8 NAME_TYPE_SUITE $20
    NAME_INCOME_TYPE $20 NAME_EDUCATION_TYPE $30 NAME_FAMILY_STATUS $20
    NAME_HOUSING_TYPE $20 REGION_POPULATION_RELATIVE 8 DAYS_BIRTH 8 DAYS_EMPLOYED
    8 DAYS_REGISTRATION 8 DAYS_ID_PUBLISH 8 OWN_CAR_AGE 8 FLAG_MOBIL 8
    FLAG_EMP_PHONE 8 FLAG_WORK_PHONE 8 FLAG_CONT_MOBILE 8 FLAG_PHONE 8 FLAG_EMAIL
    8 OCCUPATION_TYPE $25 CNT_FAM_MEMBERS 8 REGION_RATING_CLIENT 8
    REGION_RATING_CLIENT_W_CITY 8 WEEKDAY_APPR_PROCESS_START $9
    HOUR_APPR_PROCESS_START 8 REG_REGION_NOT_LIVE_REGION 8
    REG_REGION_NOT_WORK_REGION 8 LIVE_REGION_NOT_WORK_REGION 8
    REG_CITY_NOT_LIVE_CITY 8 REG_CITY_NOT_WORK_CITY 8 LIVE_CITY_NOT_WORK_CITY 8
    ORGANIZATION_TYPE $30 EXT_SOURCE_1 8 EXT_SOURCE_2 8 EXT_SOURCE_3 8
    APARTMENTS_AVG 8 BASEMENTAREA_AVG 8 YEARS_BEGINEXPLUATATION_AVG 8
    YEARS_BUILD_AVG 8 COMMONAREA_AVG 8 ELEVATORS_AVG 8 ENTRANCES_AVG 8
    FLOORSMAX_AVG 8 FLOORSMIN_AVG 8 LANDAREA_AVG 8 LIVINGAPARTMENTS_AVG 8
    LIVINGAREA_AVG 8 NONLIVINGAPARTMENTS_AVG 8 NONLIVINGAREA_AVG 8
    APARTMENTS_MODE 8 BASEMENTAREA_MODE 8 YEARS_BEGINEXPLUATATION_MODE 8
    YEARS_BUILD_MODE 8 COMMONAREA_MODE 8 ELEVATORS_MODE 8 ENTRANCES_MODE 8
    FLOORSMAX_MODE 8 FLOORSMIN_MODE 8 LANDAREA_MODE 8 LIVINGAPARTMENTS_MODE 8
    LIVINGAREA_MODE 8 NONLIVINGAPARTMENTS_MODE 8 NONLIVINGAREA_MODE 8
    APARTMENTS_MEDI 8 BASEMENTAREA_MEDI 8 YEARS_BEGINEXPLUATATION_MEDI 8
    YEARS_BUILD_MEDI 8 COMMONAREA_MEDI 8 ELEVATORS_MEDI 8 ENTRANCES_MEDI 8
    FLOORSMAX_MEDI 8 FLOORSMIN_MEDI 8 LANDAREA_MEDI 8 LIVINGAPARTMENTS_MEDI 8
    LIVINGAREA_MEDI 8 NONLIVINGAPARTMENTS_MEDI 8 NONLIVINGAREA_MEDI 8
    FONDKAPREMONT_MODE $30 HOUSETYPE_MODE $25 TOTALAREA_MODE 8
    WALLSMATERIAL_MODE $25 EMERGENCYSTATE_MODE $8 OBS_30_CNT_SOCIAL_CIRCLE 8
    DEF_30_CNT_SOCIAL_CIRCLE 8 OBS_60_CNT_SOCIAL_CIRCLE 8
    DEF_60_CNT_SOCIAL_CIRCLE 8 DAYS_LAST_PHONE_CHANGE 8 FLAG_DOCUMENT_2 8
    FLAG_DOCUMENT_3 8 FLAG_DOCUMENT_4 8 FLAG_DOCUMENT_5 8 FLAG_DOCUMENT_6 8
    FLAG_DOCUMENT_7 8 FLAG_DOCUMENT_8 8 FLAG_DOCUMENT_9 8 FLAG_DOCUMENT_10 8
    FLAG_DOCUMENT_11 8 FLAG_DOCUMENT_12 8 FLAG_DOCUMENT_13 8 FLAG_DOCUMENT_14 8
    FLAG_DOCUMENT_15 8 FLAG_DOCUMENT_16 8 FLAG_DOCUMENT_17 8 FLAG_DOCUMENT_18 8
    FLAG_DOCUMENT_19 8 FLAG_DOCUMENT_20 8 FLAG_DOCUMENT_21 8
    AMT_REQ_CREDIT_BUREAU_HOUR 8 AMT_REQ_CREDIT_BUREAU_DAY 8
    AMT_REQ_CREDIT_BUREAU_WEEK 8 AMT_REQ_CREDIT_BUREAU_MON 8
    AMT_REQ_CREDIT_BUREAU_QRT 8 AMT_REQ_CREDIT_BUREAU_YEAR 8;
  input SK_ID_CURR LOAN_DEFAULT NAME_CONTRACT_TYPE $ GENDER $ FLAG_OWN_CAR $
    FLAG_OWN_REALTY $ CNT_CHILDREN AMT_INCOME_TOTAL AMT_CREDIT AMT_ANNUITY
    AMT_GOODS_PRICE NAME_TYPE_SUITE $ NAME_INCOME_TYPE $ NAME_EDUCATION_TYPE $
    NAME_FAMILY_STATUS $ NAME_HOUSING_TYPE $ REGION_POPULATION_RELATIVE
    DAYS_BIRTH DAYS_EMPLOYED DAYS_REGISTRATION DAYS_ID_PUBLISH OWN_CAR_AGE
    FLAG_MOBIL FLAG_EMP_PHONE FLAG_WORK_PHONE FLAG_CONT_MOBILE FLAG_PHONE
    FLAG_EMAIL OCCUPATION_TYPE $ CNT_FAM_MEMBERS REGION_RATING_CLIENT
    REGION_RATING_CLIENT_W_CITY WEEKDAY_APPR_PROCESS_START $
    HOUR_APPR_PROCESS_START REG_REGION_NOT_LIVE_REGION
    REG_REGION_NOT_WORK_REGION LIVE_REGION_NOT_WORK_REGION REG_CITY_NOT_LIVE_CITY
    REG_CITY_NOT_WORK_CITY LIVE_CITY_NOT_WORK_CITY
    ORGANIZATION_TYPE $ EXT_SOURCE_1 EXT_SOURCE_2 EXT_SOURCE_3 APARTMENTS_AVG
    BASEMENTAREA_AVG YEARS_BEGINEXPLUATATION_AVG YEARS_BUILD_AVG COMMONAREA_AVG
    ELEVATORS_AVG ENTRANCES_AVG FLOORSMAX_AVG FLOORSMIN_AVG LANDAREA_AVG
    LIVINGAPARTMENTS_AVG LIVINGAREA_AVG NONLIVINGAPARTMENTS_AVG NONLIVINGAREA_AVG
```

```

APARTMENTS_MODE BASEMENTAREA_MODE YEARS_BEGINEXPLUATATION_MODE
YEARS_BUILD_MODE COMMONAREA_MODE ELEVATORS_MODE ENTRANCES_MODE FLOORSMAX_MODE
FLOORSMIN_MODE LANDAREA_MODE LIVINGAPARTMENTS_MODE LIVINGAREA_MODE
NONLIVINGAPARTMENTS_MODE NONLIVINGAREA_MODE APARTMENTS_MEDI BASEMENTAREA_MEDI
YEARS_BEGINEXPLUATATION_MEDI YEARS_BUILD_MEDI COMMONAREA_MEDI ELEVATORS_MEDI
ENTRANCES_MEDI FLOORSMAX_MEDI FLOORSMIN_MEDI LANDAREA_MEDI
LIVINGAPARTMENTS_MEDI LIVINGAREA_MEDI NONLIVINGAPARTMENTS_MEDI
NONLIVINGAREA_MEDI FONDKAPREMONT_MODE $ HOUSETYPE_MODE $ TOTALAREA_MODE
WALLSMATERIAL_MODE $ EMERGENCYSTATE_MODE $ OBS_30_CNT_SOCIAL_CIRCLE
DEF_30_CNT_SOCIAL_CIRCLE OBS_60_CNT_SOCIAL_CIRCLE DEF_60_CNT_SOCIAL_CIRCLE
DAYS_LAST_PHONE_CHANGE FLAG_DOCUMENT_2 FLAG_DOCUMENT_3 FLAG_DOCUMENT_4
FLAG_DOCUMENT_5 FLAG_DOCUMENT_6 FLAG_DOCUMENT_7 FLAG_DOCUMENT_8
FLAG_DOCUMENT_9 FLAG_DOCUMENT_10 FLAG_DOCUMENT_11 FLAG_DOCUMENT_12
FLAG_DOCUMENT_13 FLAG_DOCUMENT_14 FLAG_DOCUMENT_15 FLAG_DOCUMENT_16
FLAG_DOCUMENT_17 FLAG_DOCUMENT_18 FLAG_DOCUMENT_19 FLAG_DOCUMENT_20
FLAG_DOCUMENT_21 AMT_REQ_CREDIT_BUREAU_HOUR AMT_REQ_CREDIT_BUREAU_DAY
AMT_REQ_CREDIT_BUREAU_WEEK AMT_REQ_CREDIT_BUREAU_MON
AMT_REQ_CREDIT_BUREAU_QRT AMT_REQ_CREDIT_BUREAU_YEAR;
format AMT_INCOME_TOTAL AMT_CREDIT AMT_ANNUITY AMT_GOODS_PRICE DOLLAR12.2;
run;

title "Summary of Loan Data";

proc print data=loan_data(obs=5);
run;

proc contents data=loan_data;
run;

/* Step 2: Import and Summarize Previous Applications Data */
proc import datafile='C:/Users/eocrah/Documents/previous_application.csv'
  dbms=csv out=previous_loan_data replace;
  getnames=yes;
run;

title "Summary of Previous Loan Data";

proc print data=previous_loan_data(obs=5);
run;

proc contents data=previous_loan_data;
run;

/* Step 3: Count Frequency of Previous Loans and Merge Datasets */
proc sql;
  /* Count previous loan applications and approvals */
  create table previous_loan_count as select SK_ID_CURR, count(*) as
    previous_apps, sum(case when NAME_CONTRACT_STATUS='Approved' then 1 else 0
    end) as approved_apps from previous_loan_data group by SK_ID_CURR;

  /* Merge datasets, fill missing values with 0 */
  create table merged_data as select a.*, coalesce(b.previous_apps, 0) as
    previous_apps, coalesce(b.approved_apps, 0) as approved_apps from loan_data
    as a left join previous_loan_count as b on a.SK_ID_CURR=b.SK_ID_CURR;
quit;

title "Missing Values in Merged Dataset";

proc means data=merged_data nmiss;
run;

title "Preview of Merged Dataset";

proc print data=merged_data(obs=10);
run;

/* Step 4: Derive Credit Scores and Clean Up Data */
data merged_data;
  set merged_data;

  /* Compute standardized credit scores */
  CREDIT_SCORE_1=round((EXT_SOURCE_1 * 550) + 300);
  CREDIT_SCORE_2=round((EXT_SOURCE_2 * 550) + 300);
  CREDIT_SCORE_3=round((EXT_SOURCE_3 * 550) + 300);

  /* Remove original EXT_SOURCE variables */
  drop EXT_SOURCE_1 EXT_SOURCE_2 EXT_SOURCE_3;

```

```

run;

/* Step 5: Handle Missing Values in Categorical Data */
proc sql;
  update merged_data set OCCUPATION_TYPE='Other' where missing(OCCUPATION_TYPE);
quit;

/* Step 6: Transform Financial Variables */
data transformed_data;
  set merged_data;

  /* Apply logarithmic transformation */
  Log_AMT_INCOME_TOTAL=log(AMT_INCOME_TOTAL);
  Log_AMT_CREDIT=log(AMT_CREDIT);
  Log_AMT_ANNUITY=log(AMT_ANNUITY);
  Log_AMT_GOODS_PRICE=log(AMT_GOODS_PRICE);
run;

/* Step 7: Exploratory Data Analysis (EDA) */
title "Exploratory Analysis: Loan Default by Gender";

proc freq data=transformed_data;
  tables gender*loan_default / nocum norow nocol;
run;

title "Exploratory Analysis: Loan Default by Family Status";

proc freq data=transformed_data;
  tables name_family_status*loan_default / nocum norow nocol;
run;

title "Distribution of Financial Variables";

proc univariate data=transformed_data;
  var Log_AMT_INCOME_TOTAL Log_AMT_CREDIT Log_AMT_ANNUITY Log_AMT_GOODS_PRICE;
  histogram / normal;
  inset mean std / position=ne;
run;

/* Step 8: Logistic Regression */
title "Stepwise Logistic Regression to Predict Loan Defaults";

proc logistic data=transformed_data;
  class GENDER (REF='F') NAME_CONTRACT_TYPE (REF='Revolving loans')
    NAME_EDUCATION_TYPE (REF='Higher education')
    NAME_FAMILY_STATUS (REF='Married') OCCUPATION_TYPE (REF='Other')
    WEEKDAY_APPR_PROCESS_START (REF='MONDAY')
    NAME_HOUSING_TYPE (REF='Rented apartment')
    ORGANIZATION_TYPE (REF='Government') FLAG_OWN_CAR (REF='Y')
    FLAG_OWN_REALTY (REF='Y') NAME_INCOME_TYPE (REF='Unemployed')
    HOUR_APPR_PROCESS_START (REF='0');
  model LOAN_DEFAULT(EVENT='1')=NAME_CONTRACT_TYPE NAME_FAMILY_STATUS
    CNT_CHILDREN PREVIOUS_APPS CREDIT_SCORE_2 GENDER NAME_EDUCATION_TYPE
    LOG_AMT_INCOME_TOTAL APPROVED_APPS OCCUPATION_TYPE WEEKDAY_APPR_PROCESS_START
    ORGANIZATION_TYPE FLAG_OWN_CAR FLAG_OWN_REALTY NAME_INCOME_TYPE
    Log_AMT_INCOME_TOTAL Log_AMT_CREDIT Log_AMT_ANNUITY Log_AMT_GOODS_PRICE
    DAYS_BIRTH DAYS_EMPLOYED DAYS_REGISTRATION DAYS_ID_PUBLISH
    DAYS_LAST_PHONE_CHANGE FLAG_DOCUMENT_2 FLAG_DOCUMENT_3 FLAG_DOCUMENT_4
    FLAG_DOCUMENT_5 FLAG_DOCUMENT_6 FLAG_DOCUMENT_7 FLAG_DOCUMENT_8
    FLAG_DOCUMENT_9 FLAG_DOCUMENT_10 FLAG_DOCUMENT_11 FLAG_DOCUMENT_12
    FLAG_DOCUMENT_13 FLAG_DOCUMENT_14 FLAG_DOCUMENT_15 FLAG_DOCUMENT_16
    FLAG_DOCUMENT_17 FLAG_DOCUMENT_18 FLAG_DOCUMENT_19 FLAG_DOCUMENT_20
    FLAG_DOCUMENT_21 REGION_RATING_CLIENT REGION_RATING_CLIENT_W_CITY
    HOUR_APPR_PROCESS_START / SELECTION=STEPWISE SLENTRY=0.05 SLSTAY=0.05;
  title "Stepwise Logistic Regression";
run;

```

Log: Loan Default Project.sas

Notes (79)

```

1      OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
NOTE: ODS statements in the SAS Studio environment may disable some output features.
73
74      /* Step 1: Read and Preprocess the Raw Data */
75      data loan_data;
76      infile 'C:/Users/eocrah/Documents/application_data.csv' DSD MISSOVER

```

399

400 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;

412

Results: Loan Default Project.sas**Summary of Loan Data**

Obs	SK_ID_CURR	LOAN_DEFAULT	NAME_CONTRACT_TYPE	GENDER	FLAG_OWN_CAR	FLAG_OWN_REALTY	CNT_CHILDREN	AMT_INCOME_TOTAL	AMT_CREDIT	AMT_ANNUITY	AMT_GOODS_PRICE
1	100002	1	Cash loans	M	N	Y	0	\$202,500.00	\$406,597.50	\$24,700.50	\$351,000.00
2	100003	0	Cash loans	F	N	N	0	\$270,000.00	\$1293502.50	\$35,698.50	\$1129500.00
3	100004	0	Revolving loans	M	Y	Y	0	\$67,500.00	\$135,000.00	\$6,750.00	\$135,000.00
4	100006	0	Cash loans	F	N	Y	0	\$135,000.00	\$312,682.50	\$29,686.50	\$297,000.00
5	100007	0	Cash loans	M	N	Y	0	\$121,500.00	\$513,000.00	\$21,865.50	\$513,000.00

Summary of Loan Data

The CONTENTS Procedure

Data Set Name	WORK.LOAN_DATA	Observations	307511
Member Type	DATA	Variables	122
Engine	V9	Indexes	0
Created	01/18/2025 15:12:32	Observation Length	1128
Last Modified	01/18/2025 15:12:32	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information	
Data Set Page Size	94208
Number of Data Set Pages	3706
First Data Page	1
Max Obs per Page	83
Obs in First Data Page	71
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	C:\Users\leocrah\AppData\Local\Temp\SAS Temporary Files_TD8328_RL-119-024_\Prc2\loan_data.sas7bdat
Release Created	9.0401M6
Host Created	X64_10PRO
Owner Name	UA-NET\leocrah
File Size	333MB
File Size (bytes)	349229056

Alphabetic List of Variables and Attributes				
#	Variable	Type	Len	Format
10	AMT_ANNUITY	Num	8	DOLLAR12,2
9	AMT_CREDIT	Num	8	DOLLAR12,2
11	AMT_GOODS_PRICE	Num	8	DOLLAR12,2
8	AMT_INCOME_TOTAL	Num	8	DOLLAR12,2
118	AMT_REQ_CREDIT_BUREAU_DAY	Num	8	
117	AMT_REQ_CREDIT_BUREAU_HOUR	Num	8	
120	AMT_REQ_CREDIT_BUREAU_MON	Num	8	
121	AMT_REQ_CREDIT_BUREAU_QRT	Num	8	
119	AMT_REQ_CREDIT_BUREAU_WEEK	Num	8	
122	AMT_REQ_CREDIT_BUREAU_YEAR	Num	8	
45	APARTMENTS_AVG	Num	8	
73	APARTMENTS_MEDI	Num	8	
59	APARTMENTS_MODE	Num	8	
46	BASEMENTAREA_AVG	Num	8	
74	BASEMENTAREA_MEDI	Num	8	
60	BASEMENTAREA_MODE	Num	8	
7	CNT_CHILDREN	Num	8	
30	CNT_FAM_MEMBERS	Num	8	
49	COMMONAREA_AVG	Num	8	
77	COMMONAREA_MEDI	Num	8	
63	COMMONAREA_MODE	Num	8	
18	DAY_BIRTH	Num	8	
19	DAY_EMPLOYED	Num	8	
21	DAY_ID_PUBLISH	Num	8	
96	DAY_LAST_PHONE_CHANGE	Num	8	
20	DAY_REGISTRATION	Num	8	
93	DEF_30_CNT_SOCIAL_CIRCLE	Num	8	
95	DEF_60_CNT_SOCIAL_CIRCLE	Num	8	

Alphabetic List of Variables and Attributes				
#	Variable	Type	Len	Format
50	ELEVATORS_AVG	Num	8	
78	ELEVATORS_MEDI	Num	8	
64	ELEVATORS_MODE	Num	8	
91	EMERGENCYSTATE_MODE	Char	8	
51	ENTRANCES_AVG	Num	8	
79	ENTRANCES_MEDI	Num	8	
65	ENTRANCES_MODE	Num	8	
42	EXT_SOURCE_1	Num	8	
43	EXT_SOURCE_2	Num	8	
44	EXT_SOURCE_3	Num	8	
26	FLAG_CONT_MOBILE	Num	8	
97	FLAG_DOCUMENT_2	Num	8	
98	FLAG_DOCUMENT_3	Num	8	
99	FLAG_DOCUMENT_4	Num	8	
100	FLAG_DOCUMENT_5	Num	8	
101	FLAG_DOCUMENT_6	Num	8	
102	FLAG_DOCUMENT_7	Num	8	
103	FLAG_DOCUMENT_8	Num	8	
104	FLAG_DOCUMENT_9	Num	8	
105	FLAG_DOCUMENT_10	Num	8	
106	FLAG_DOCUMENT_11	Num	8	
107	FLAG_DOCUMENT_12	Num	8	
108	FLAG_DOCUMENT_13	Num	8	
109	FLAG_DOCUMENT_14	Num	8	
110	FLAG_DOCUMENT_15	Num	8	
111	FLAG_DOCUMENT_16	Num	8	
112	FLAG_DOCUMENT_17	Num	8	
113	FLAG_DOCUMENT_18	Num	8	
114	FLAG_DOCUMENT_19	Num	8	
115	FLAG_DOCUMENT_20	Num	8	
116	FLAG_DOCUMENT_21	Num	8	
28	FLAG_EMAIL	Num	8	
24	FLAG_EMP_PHONE	Num	8	
23	FLAG_MOBIL	Num	8	
5	FLAG_OWN_CAR	Char	1	
6	FLAG_OWN_REALTY	Char	1	
27	FLAG_PHONE	Num	8	
25	FLAG_WORK_PHONE	Num	8	
52	FLOORSMAX_AVG	Num	8	
80	FLOORSMAX_MEDI	Num	8	
66	FLOORSMAX_MODE	Num	8	
53	FLOORSMIN_AVG	Num	8	
81	FLOORSMIN_MEDI	Num	8	
67	FLOORSMIN_MODE	Num	8	
87	FONDKAPREMONT_MODE	Char	30	
4	GENDER	Char	1	
34	HOUR_APPR_PROCESS_START	Num	8	
88	HOUSETYPE_MODE	Char	25	
54	LANDAREA_AVG	Num	8	
82	LANDAREA_MEDI	Num	8	
68	LANDAREA_MODE	Num	8	
40	LIVE_CITY_NOT_WORK_CITY	Num	8	
37	LIVE_REGION_NOT_WORK_REGION	Num	8	
55	LIVINGAPARTMENTS_AVG	Num	8	
83	LIVINGAPARTMENTS_MEDI	Num	8	
69	LIVINGAPARTMENTS_MODE	Num	8	
56	LIVINGAREA_AVG	Num	8	
84	LIVINGAREA_MEDI	Num	8	
70	LIVINGAREA_MODE	Num	8	
2	LOAN_DEFAULT	Num	3	
3	NAME_CONTRACT_TYPE	Char	15	
14	NAME_EDUCATION_TYPE	Char	30	
15	NAME_FAMILY_STATUS	Char	20	
16	NAME_HOUSING_TYPE	Char	20	
13	NAME_INCOME_TYPE	Char	20	
12	NAME_TYPE_SUITE	Char	20	
57	NONLIVINGAPARTMENTS_AVG	Num	8	
85	NONLIVINGAPARTMENTS_MEDI	Num	8	
71	NONLIVINGAPARTMENTS_MODE	Num	8	
58	NONLIVINGAREA_AVG	Num	8	
86	NONLIVINGAREA_MEDI	Num	8	
72	NONLIVINGAREA_MODE	Num	8	
92	OBS_30_CNT_SOCIAL_CIRCLE	Num	8	
94	OBS_60_CNT_SOCIAL_CIRCLE	Num	8	
29	OCCUPATION_TYPE	Char	25	
41	ORGANIZATION_TYPE	Char	30	
22	OWN_CAR_AGE	Num	8	
17	REGION_POPULATION_RELATIVE	Num	8	
31	REGION_RATING_CLIENT	Num	8	

Alphabetic List of Variables and Attributes				
#	Variable	Type	Len	Format
32	REGION_RATING_CLIENT_W_CITY	Num	8	
38	REG_CITY_NOT_LIVE_CITY	Num	8	
39	REG_CITY_NOT_WORK_CITY	Num	8	
35	REG_REGION_NOT_LIVE_REGION	Num	8	
36	REG_REGION_NOT_WORK_REGION	Num	8	
1	SK_ID_CURR	Num	6	
89	TOTALAREA_MODE	Num	8	
90	WALLSMATERIAL_MODE	Char	25	
33	WEEKDAY_APPR_PROCESS_START	Char	9	
47	YEARS_BEGINEXPLUATATION_AVG	Num	8	
75	YEARS_BEGINEXPLUATATION_MEDI	Num	8	
61	YEARS_BEGINEXPLUATATION_MODE	Num	8	
48	YEARS_BUILD_AVG	Num	8	
76	YEARS_BUILD_MEDI	Num	8	
62	YEARS_BUILD_MODE	Num	8	

Summary of Previous Loan Data

Obs	SK_ID_PREV	SK_ID_CURR	NAME_CONTRACT_TYPE	AMT_ANNUITY	AMT_APPLICATION	AMT_CREDIT	AMT_DOWN_PAYMENT	AMT_GOODS_PRICE	WEEKDAY_APPR_PROCESS_START	HOUR_APPR_F
1	2030495	271877	Consumer loans	1730.43	17145	17145	0	17145	SATURDAY	
2	2802425	108129	Cash loans	25188.615	607500	679671	.	607500	THURSDAY	
3	2523466	122040	Cash loans	15060.735	112500	136444.5	.	112500	TUESDAY	
4	2819243	176158	Cash loans	47041.335	450000	470790	.	450000	MONDAY	
5	1784265	202054	Cash loans	31924.395	337500	404055	.	337500	THURSDAY	

Summary of Previous Loan Data

The CONTENTS Procedure

Data Set Name	WORK.PREVIOUS_LOAN_DATA	Observations	1670214
Member Type	DATA	Variables	37
Engine	V9	Indexes	0
Created	01/18/2025 15:12:34	Observation Length	392
Last Modified	01/18/2025 15:12:34	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information	
Data Set Page Size	65536
Number of Data Set Pages	10002
First Data Page	1
Max Obs per Page	167
Obs in First Data Page	153
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	C:\Users\leocrah\AppData\Local\Temp\SAS Temporary Files_TD8328_RL-119-024_\Prc2\previous_loan_data.sas7bdat
Release Created	9.0401M6
Host Created	X64_10PRO
Owner Name	UA-NET\leocrah
File Size	625MB
File Size (bytes)	655556608

Alphabetic List of Variables and Attributes				
#	Variable	Type	Len	Format
4	AMT_ANNUITY	Num	8	BEST12., BEST32.
5	AMT_APPLICATION	Num	8	BEST12., BEST32.
6	AMT_CREDIT	Num	8	BEST12., BEST32.
7	AMT_DOWN_PAYMENT	Num	8	BEST12., BEST32.
8	AMT_GOODS_PRICE	Num	8	BEST12., BEST32.
26	CHANNEL_TYPE	Char	23	\$23.
29	CNT_PAYMENT	Num	8	BEST12., BEST32.
20	CODE_REJECT_REASON	Char	3	\$3.
18	DAYS_DECISION	Num	8	BEST12., BEST32.
32	DAYS_FIRST_DRAWING	Num	8	BEST12., BEST32.
33	DAYS_FIRST_DUE	Num	8	BEST12., BEST32.
35	DAYS_LAST_DUE	Num	8	BEST12., BEST32.
34	DAYS_LAST_DUE_1ST_VERSION	Num	8	BEST12., BEST32.
36	DAYS_TERMINATION	Num	8	BEST12., BEST32.
11	FLAG_LAST_APPL_PER_CONTRACT	Char	1	\$1.
10	HOUR_APPR_PROCESS_START	Num	8	BEST12., BEST32.
16	NAME_CASH_LOAN_PURPOSE	Char	17	\$17..

Alphabetic List of Variables and Attributes					
#	Variable	Type	Len	Format	Informat
22	NAME_CLIENT_TYPE	Char	8	\$8.	\$8.
17	NAME_CONTRACT_STATUS	Char	8	\$8.	\$8.
3	NAME_CONTRACT_TYPE	Char	15	\$15.	\$15.
23	NAME_GOODS_CATEGORY	Char	24	\$24.	\$24.
19	NAME_PAYMENT_TYPE	Char	21	\$21.	\$21.
24	NAME_PORTFOLIO	Char	5	\$5.	\$5.
25	NAME_PRODUCT_TYPE	Char	7	\$7.	\$7.
28	NAME_SELLER_INDUSTRY	Char	20	\$20.	\$20.
21	NAME_TYPE_SUITE	Char	17	\$17.	\$17.
30	NAME_YIELD_GROUP	Char	10	\$10.	\$10.
37	NFLAG_INSURED_ON_APPROVAL	Num	8	BEST12.	BEST32.
12	NFLAG_LAST_APPL_IN_DAY	Num	8	BEST12.	BEST32.
31	PRODUCT_COMBINATION	Char	30	\$30.	\$30.
13	RATE_DOWN_PAYMENT	Num	8	BEST12.	BEST32.
14	RATE_INTEREST_PRIMARY	Num	8	BEST12.	BEST32.
15	RATE_INTEREST_PRIVILEGED	Num	8	BEST12.	BEST32.
27	SELLERPLACE_AREA	Num	8	BEST12.	BEST32.
2	SK_ID_CURR	Num	8	BEST12.	BEST32.
1	SK_ID_PREV	Num	8	BEST12.	BEST32.
9	WEEKDAY_APPR_PROCESS_START	Char	8	\$8.	\$8.

Missing Values in Merged Dataset

The MEANS Procedure

Variable	N Miss
SK_ID_CURR	0
LOAN_DEFAULT	0
CNT_CHILDREN	0
AMT_INCOME_TOTAL	0
AMT_CREDIT	0
AMT_ANNUITY	12
AMT_GOODS_PRICE	278
REGION_POPULATION_RELATIVE	0
DAYS_BIRTH	0
DAYS_EMPLOYED	0
DAYS_REGISTRATION	0
DAYS_ID_PUBLISH	0
OWN_CAR_AGE	202929
FLAG_MOBIL	0
FLAG_EMP_PHONE	0
FLAG_WORK_PHONE	0
FLAG_PHONE	0
FLAG_EMAIL	0
CNT_FAM_MEMBERS	2
REGION_RATING_CLIENT	0
REGION_RATING_CLIENT_W_CITY	0
HOUR_APPR_PROCESS_START	0
REG_REGION_NOT_LIVE_REGION	0
REG_REGION_NOT_WORK_REGION	0
LIVE_REGION_NOT_WORK_REGION	0
REG_CITY_NOT_LIVE_CITY	0
REG_CITY_NOT_WORK_CITY	0
LIVE_CITY_NOT_WORK_CITY	0
EXT_SOURCE_1	173378
EXT_SOURCE_2	660
EXT_SOURCE_3	60965
APARTMENTS_AVG	156061
BASEMENTAREA_AVG	179943
YEARS_BEGINEXPLATATION_AVG	150007
YEARS_BUILD_AVG	204488
COMMONAREA_AVG	214865
ELEVATORS_AVG	163891
ENTRANCES_AVG	154828
FLOORSMAX_AVG	153020
FLOORSMIN_AVG	208642
LANDAREA_AVG	182590
LIVINGAPARTMENTS_AVG	210199
LIVINGAREA_AVG	154350
NONLIVINGAPARTMENTS_AVG	213514
NONLIVINGAREA_AVG	169682
APARTMENTS_MODE	156061
BASEMENTAREA_MODE	179943
YEARS_BEGINEXPLATATION_MODE	150007
YEARS_BUILD_MODE	204488
COMMONAREA_MODE	214865
ELEVATORS_MODE	163891
ENTRANCES_MODE	154828
FLOORSMAX_MODE	153020
FLOORSMIN_MODE	208642
LANDAREA_MODE	182590
LIVINGAPARTMENTS_MODE	210199
LIVINGAREA_MODE	154350
NONLIVINGAPARTMENTS_MODE	213514
NONLIVINGAREA_MODE	169682
APARTMENTS_MEDI	156061
BASEMENTAREA_MEDI	179943
YEARS_BEGINEXPLATATION_MEDI	150007
YEARS_BUILD_MEDI	204488
COMMONAREA_MEDI	214865
ELEVATORS_MEDI	163891
ENTRANCES_MEDI	154828
FLOORSMAX_MEDI	153020
FLOORSMIN_MEDI	208642
LANDAREA_MEDI	182590
LIVINGAPARTMENTS_MEDI	210199
LIVINGAREA_MEDI	154350
NONLIVINGAPARTMENTS_MEDI	213514
NONLIVINGAREA_MEDI	169682
TOTALAREA_MODE	148431
OBS_30_CNT_SOCIAL_CIRCLE	1021
DEF_30_CNT_SOCIAL_CIRCLE	1021
OBS_60_CNT_SOCIAL_CIRCLE	1021
DEF_60_CNT_SOCIAL_CIRCLE	1021
DAYS_LAST_PHONE_CHANGE	1
FLAG_DOCUMENT_2	0
FLAG_DOCUMENT_3	0
FLAG_DOCUMENT_4	0
FLAG_DOCUMENT_5	0
FLAG_DOCUMENT_6	0

Variable	N Miss
FLAG_DOCUMENT_7	0
FLAG_DOCUMENT_8	0
FLAG_DOCUMENT_9	0
FLAG_DOCUMENT_10	0
FLAG_DOCUMENT_11	0
FLAG_DOCUMENT_12	0
FLAG_DOCUMENT_13	0
FLAG_DOCUMENT_14	0
FLAG_DOCUMENT_15	0
FLAG_DOCUMENT_16	0
FLAG_DOCUMENT_17	0
FLAG_DOCUMENT_18	0
FLAG_DOCUMENT_19	0
FLAG_DOCUMENT_20	0
FLAG_DOCUMENT_21	0
AMT_REQ_CREDIT_BUREAU_HOUR	41519
AMT_REQ_CREDIT_BUREAU_DAY	41519
AMT_REQ_CREDIT_BUREAU_WEEK	41519
AMT_REQ_CREDIT_BUREAU_MON	41519
AMT_REQ_CREDIT_BUREAU_QRT	41519
AMT_REQ_CREDIT_BUREAU_YEAR	41519
previous_apps	0
approved_apps	0

Preview of Merged Dataset

Obs	SK_ID_CURR	LOAN_DEFAULT	NAME_CONTRACT_TYPE	GENDER	FLAG_OWN_CAR	FLAG_OWN_REALTY	CNT_CHILDREN	AMT_INCOME_TOTAL	AMT_CREDIT	AMT_ANNUITY	AMT_GOODS_PRICE
1	100002	1	Cash loans	M	N	Y	0	\$202,500.00	\$406,597.50	\$24,700.50	\$351,000.00
2	100003	0	Cash loans	F	N	N	0	\$270,000.00	\$1293502.50	\$35,698.50	\$1129500.00
3	100004	0	Revolving loans	M	Y	Y	0	\$67,500.00	\$135,000.00	\$6,750.00	\$135,000.00
4	100006	0	Cash loans	F	N	Y	0	\$135,000.00	\$312,682.50	\$29,686.50	\$297,000.00
5	100007	0	Cash loans	M	N	Y	0	\$121,500.00	\$513,000.00	\$21,865.50	\$513,000.00
6	100008	0	Cash loans	M	N	Y	0	\$99,000.00	\$490,495.50	\$27,517.50	\$454,500.00
7	100009	0	Cash loans	F	Y	Y	1	\$171,000.00	\$1560726.00	\$41,301.00	\$1395000.00
8	100010	0	Cash loans	M	Y	Y	0	\$360,000.00	\$1530000.00	\$42,075.00	\$1530000.00
9	100011	0	Cash loans	F	N	Y	0	\$112,500.00	\$1019610.00	\$33,826.50	\$913,500.00
10	100012	0	Revolving loans	M	N	Y	0	\$135,000.00	\$405,000.00	\$20,250.00	\$405,000.00

Exploratory Analysis: Loan Default by Gender

The FREQ Procedure

Frequency Percent		Table of GENDER by LOAN_DEFAULT		
GENDER	LOAN_DEFAULT			Total
	0	1	Total	
F	188278 61.23	14170 4.61	202448 65.83	
M	94404 30.70	10655 3.46	105059 34.16	
X	4 0.00	0 0.00	4 0.00	
Total	282686 91.93	24825 8.07	307511 100.00	

Exploratory Analysis: Loan Default by Family Status

The FREQ Procedure

Frequency Percent		Table of NAME_FAMILY_STATUS by LOAN_DEFAULT		
NAME_FAMILY_STATUS	LOAN_DEFAULT			Total
	0	1	Total	
Civil marriage	26814 8.72	2961 0.96	29775 9.68	
Married	181582 59.05	14850 4.83	196432 63.88	
Separated	18150 5.90	1620 0.53	19770 6.43	
Single / not married	40987 13.33	4457 1.45	45444 14.78	
Unknown	2 0.00	0 0.00	2 0.00	
Widow	15151 4.93	937 0.30	16088 5.23	
Total	282686 91.93	24825 8.07	307511 100.00	

Distribution of Financial Variables

The UNIVARIATE Procedure
Variable: Log_AMT_INCOME_TOTAL

Moments

Moments			
N	307511	Sum Weights	307511
Mean	11.9092378	Sum Observations	3662221.62
Std Deviation	0.48891008	Variance	0.23903307
Skewness	0.16996911	Kurtosis	0.75111231
Uncorrected SS	43687773.1	Corrected SS	73505.058
Coeff Variation	4.10530118	Std Error Mean	0.00088165

Basic Statistical Measures			
Location		Variability	
Mean	11.90924	Std Deviation	0.48891
Median	11.89921	Variance	0.23903
Mode	11.81303	Range	8.42539
		Interquartile Range	0.58779

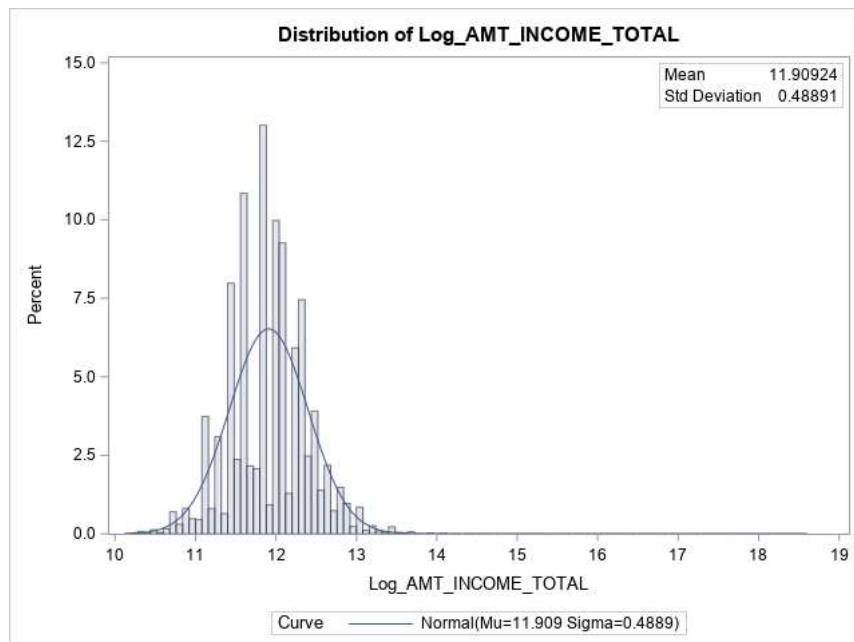
Tests for Location: Mu0=0				
Test	Statistic	p Value		
Student's t	t	13507.82	Pr > t	<.0001
Sign	M	153755.5	Pr >= M	<.0001
Signed Rank	S	2.364E10	Pr >= S	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	18.5777
99%	13.0658
95%	12.7293
90%	12.5062
75% Q3	12.2185
50% Median	11.8992
25% Q1	11.6307
10%	11.3022
5%	11.1199
1%	10.7144
0% Min	10.1523

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
10.1523	20728	15.7251	131128
10.1523	1679	16.0127	77769
10.1697	246105	16.4182	246859
10.1697	240138	16.7059	203694
10.1697	186644	18.5777	12841

Distribution of Financial Variables

The UNIVARIATE Procedure



Distribution of Financial Variables

The UNIVARIATE Procedure

Fitted Normal Distribution for Log_AMT_INCOME_TOTAL

Parameters for Normal Distribution		
Parameter	Symbol	Estimate
Mean	Mu	11.90924
Std Dev	Sigma	0.48891

Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic	p Value		
Kolmogorov-Smirnov	D	0.063924	Pr > D	<0.010
Cramer-von Mises	W-Sq	147.902789	Pr > W-Sq	<0.005
Anderson-Darling	A-Sq	782.345977	Pr > A-Sq	<0.005

Quantiles for Normal Distribution		
Percent	Quantile	
	Observed	Estimated
1.0	10.7144	10.7719
5.0	11.1199	11.1051
10.0	11.3022	11.2827
25.0	11.6307	11.5795
50.0	11.8992	11.9092
75.0	12.2185	12.2390
90.0	12.5062	12.5358
95.0	12.7293	12.7134
99.0	13.0658	13.0466

Distribution of Financial Variables

The UNIVARIATE Procedure
Variable: Log_AMT_CREDIT

Moments			
N	307511	Sum Weights	307511
Mean	13.0701053	Sum Observations	4019201.15
Std Deviation	0.71519552	Variance	0.51150463
Skewness	-0.3388232	Kurtosis	-0.2870161
Uncorrected SS	52688675	Corrected SS	157292.788
Coeff Variation	5.47199506	Std Error Mean	0.00128972

Basic Statistical Measures			
Location	Variability		
Mean	13.07011	Std Deviation	0.71520
Median	13.14907	Variance	0.51150
Mode	13.01700	Range	4.49981
		Interquartile Range	1.09694

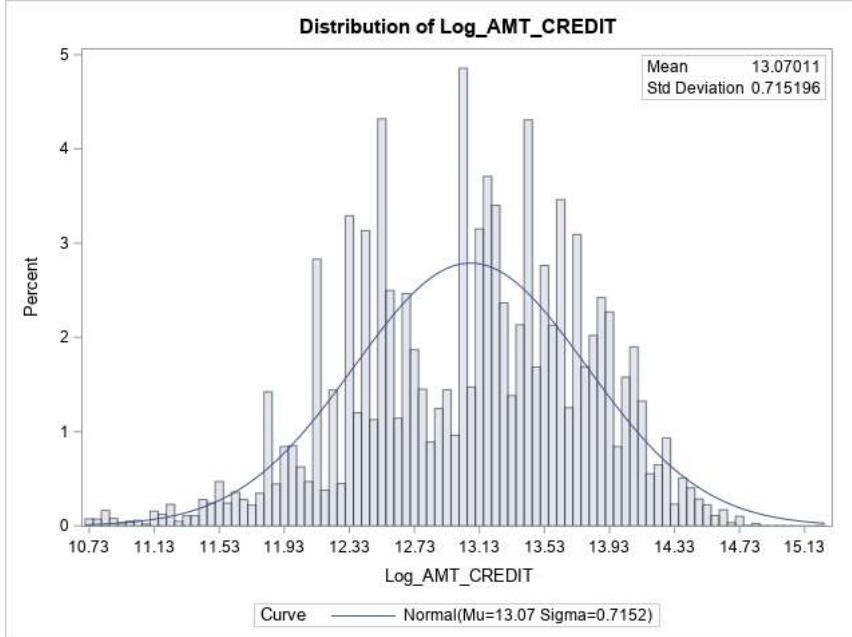
Tests for Location: Mu0=0				
Test	Statistic	p Value		
Student's t	t	10134.09	Pr > t	<.0001
Sign	M	153755.5	Pr >= M	<.0001
Signed Rank	S	2.364E10	Pr >= S	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	15.2142
99%	14.4329
95%	14.1156
90%	13.9410
75% Q3	13.6031
50% Median	13.1491
25% Q1	12.5062
10%	12.1007
5%	11.8130
1%	11.2439
0% Min	10.7144

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
10.7144	305856	15.2142	119682
10.7144	303974	15.2142	120758
10.7144	303879	15.2142	133767
10.7144	301598	15.2142	287733
10.7144	299193	15.2142	288456

Distribution of Financial Variables

The UNIVARIATE Procedure



Distribution of Financial Variables

The UNIVARIATE Procedure
Fitted Normal Distribution for Log_AMT_CREDIT

Parameters for Normal Distribution		
Parameter	Symbol	Estimate
Mean	Mu	13.07011
Std Dev	Sigma	0.715196

Goodness-of-Fit Tests for Normal Distribution			
Test	Statistic		p Value
Kolmogorov-Smirnov	D	0.06123	Pr > D <0.010
Cramer-von Mises	W-Sq	221.40006	Pr > W-Sq <0.005
Anderson-Darling	A-Sq	1228.77908	Pr > A-Sq <0.005

Percent	Quantile	
	Observed	Estimated
1.0	11.2439	11.4063
5.0	11.8130	11.8937
10.0	12.1007	12.1535
25.0	12.5062	12.5877
50.0	13.1491	13.0701
75.0	13.6031	13.5525
90.0	13.9410	13.9867
95.0	14.1156	14.2465
99.0	14.4329	14.7339

Distribution of Financial Variables

The UNIVARIATE Procedure
Variable: Log_AMT_ANNUITY

Moments			
N	307499	Sum Weights	307499
Mean	10.0676249	Sum Observations	3095784.6
Std Deviation	0.54591163	Variance	0.29801951
Skewness	-0.3457449	Kurtosis	-0.0053553
Uncorrected SS	31258838.7	Corrected SS	91640.404
Coeff Variation	5.42244707	Std Error Mean	0.00098447

Basic Statistical Measures			
Location		Variability	
Mean	10.06762	Std Deviation	0.54591
Median	10.12274	Variance	0.29802
Mode	9.10498	Range	5.07341
		Interquartile Range	0.73892

Tests for Location: Mu0=0		
Test	Statistic	p Value

Tests for Location: Mu0=0				
Test	Statistic	p Value		
Student's t	t	10226.49	Pr > t	<.0001
Sign	M	153749.5	Pr >= M	<.0001
Signed Rank	S	2.364E10	Pr >= S	<.0001

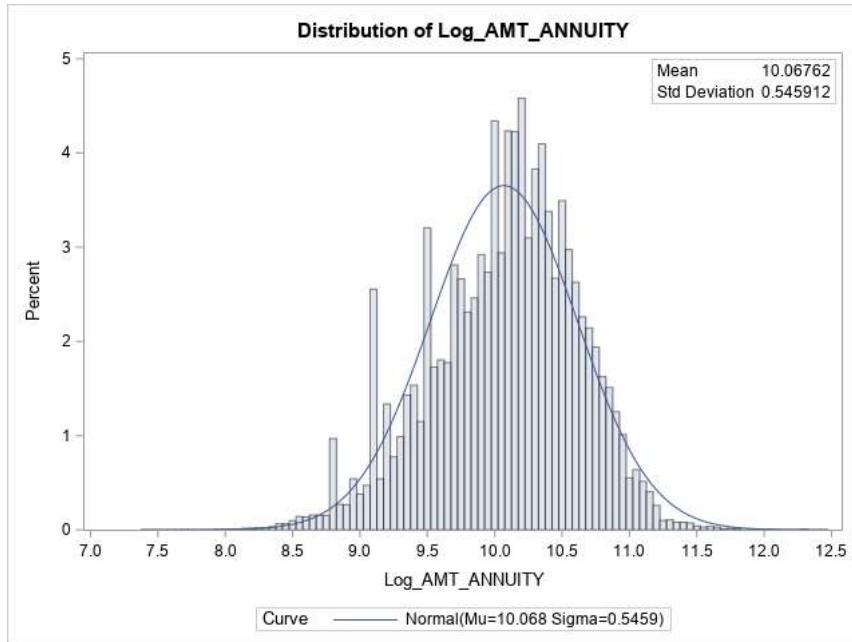
Quantiles (Definition 5)	
Level	Quantile
100% Max	12,46081
99%	11,15634
95%	10,88416
90%	10,73540
75% Q3	10,45149
50% Median	10,12274
25% Q1	9,71257
10%	9,31240
5%	9,10498
1%	8,72883
0% Min	7,38740

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
7,38740	277187	12,3239	266149
7,59085	145397	12,3239	268279
7,59085	73550	12,3239	268456
7,59765	125237	12,3465	101509
7,62657	17049	12,4608	17949

Missing Values			
Missing Value	Count	Percent Of	
		All Obs	Missing Obs
.	12	0,00	100,00

Distribution of Financial Variables

The UNIVARIATE Procedure



Distribution of Financial Variables

The UNIVARIATE Procedure

Fitted Normal Distribution for Log_AMT_ANNUITY

Parameters for Normal Distribution		
Parameter	Symbol	Estimate
Mean	Mu	10.06762
Std Dev	Sigma	0.545912

Goodness-of-Fit Tests for Normal Distribution				
Test	Statistic	p Value		
Kolmogorov-Smirnov	D	0,047230	Pr > D	<0,010
Cramer-von Mises	W-Sq	164,510636	Pr > W-Sq	<0,005

Goodness-of-Fit Tests for Normal Distribution			
Test	Statistic	p Value	
Anderson-Darling	A-Sq	949.231130	Pr > A-Sq <0,005

Quantiles for Normal Distribution		
Percent	Quantile	
	Observed	Estimated
1.0	8,72883	8,79764
5.0	9,10498	9,16968
10.0	9,31240	9,36801
25.0	9,71257	9,69941
50.0	10,12274	10,06762
75.0	10,45149	10,43584
90.0	10,73540	10,76724
95.0	10,88416	10,96557
99.0	11,15634	11,33761

Distribution of Financial Variables

The UNIVARIATE Procedure
Variable: Log_AMT_GOODS_PRICE

Moments			
N	307233	Sum Weights	307233
Mean	12.9604844	Sum Observations	3981888.49
Std Deviation	0.71552074	Variance	0.51196993
Skewness	-0.2929529	Kurtosis	-0.270524
Uncorrected SS	51764497.1	Corrected SS	157293.545
Coeff Variation	5.52078702	Std Error Mean	0.00129089

Basic Statistical Measures			
Location	Variability		
Mean	12.96048	Std Deviation	0.71552
Median	13.01700	Variance	0.51197
Mode	13.01700	Range	4.60517
		Interquartile Range	1.04699

Tests for Location: Mu0=0			
Test	Statistic	p Value	
Student's t	t	10039.98	Pr > t <.0001
Sign	M	153616.5	Pr >= M <.0001
Signed Rank	S	2,36E10	Pr >= S <.0001

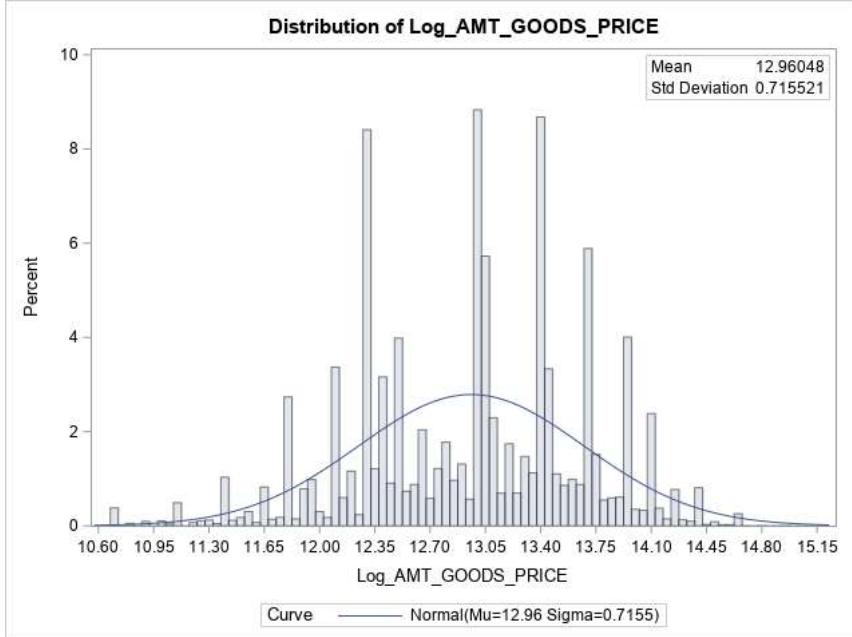
Quantiles (Definition 5)	
Level	Quantile
100% Max	15,2142
99%	14,4033
95%	14,0817
90%	13,9049
75% Q3	13,4291
50% Median	13,0170
25% Q1	12,3821
10%	12,1007
5%	11,8130
1%	11,1199
0% Min	10,6091

Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
10,6091	298543	15,2142	119682
10,7144	307401	15,2142	120758
10,7144	307292	15,2142	133767
10,7144	307122	15,2142	287733
10,7144	306933	15,2142	288456

Missing Values			
Missing Value	Count	Percent Of	
		All Obs	Missing Obs
.	278	0,09	100.00

Distribution of Financial Variables

The UNIVARIATE Procedure



Distribution of Financial Variables

The UNIVARIATE Procedure
Fitted Normal Distribution for Log_AMT_GOODS_PRICE

Parameters for Normal Distribution		
Parameter	Symbol	Estimate
Mean	Mu	12.96048
Std Dev	Sigma	0.715521

Goodness-of-Fit Tests for Normal Distribution			
Test	Statistic		p Value
Kolmogorov-Smirnov	D	0.10198	Pr > D <0.010
Cramer-von Mises	W-Sq	345.15320	Pr > W-Sq <0.005
Anderson-Darling	A-Sq	1809.55317	Pr > A-Sq <0.005

Percent	Quantile	
	Observed	Estimated
1.0	11.1199	11.2959
5.0	11.8130	11.7836
10.0	12.1007	12.0435
25.0	12.3821	12.4779
50.0	13.0170	12.9605
75.0	13.4291	13.4431
90.0	13.9049	13.8775
95.0	14.0817	14.1374
99.0	14.4033	14.6250

Stepwise Logistic Regression

The LOGISTIC Procedure

Model Information	
Data Set	WORK.TRANSFORMED_DATA
Response Variable	LOAN_DEFAULT
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	307511
Number of Observations Used	306562

Response Profile		
Ordered Value	LOAN_DEFAULT	Total Frequency
1	0	281810
2	1	24752

Probability modeled is LOAN_DEFAULT=1.

Note: 949 observations were deleted due to missing values for the response or explanatory variables.

Stepwise Selection Procedure

Step 0. Intercept entered:

Model Convergence Status

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

-2 Log L = 172026.94

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
15080.9195	159	<.0001

Step 1. Effect CREDIT_SCORE_2 entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	164816.30
SC	172039.57	164837.57
-2 Log L	172026.94	164812.30

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	7214.6340	1	<.0001
Score	7905.5013	1	<.0001
Wald	7425.3059	1	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
7291.7503	158	<.0001

Note: No effects for the model in Step 1 are removed.

Step 2. Effect OCCUPATION_TYPE entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	163432.23
SC	172039.57	163644.89
-2 Log L	172026.94	163392.23

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	8634.7068	19	<.0001
Score	9323.3062	19	<.0001
Wald	8697.0577	19	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
5886.4663	140	<.0001

Note: No effects for the model in Step 2 are removed.

Step 3. Effect DAYS_BIRTH entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	162536.22
SC	172039.57	162759.51
-2 Log L	172026.94	162494.22

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	9532.7198	20	<.0001
Score	10194.6151	20	<.0001
Wald	9486.4554	20	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
4986.4212	139	<.0001

Note: No effects for the model in Step 3 are removed.

Step 4. Effect NAME_EDUCATION_TYPE entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	162109.28
SC	172039.57	162375.11
-2 Log L	172026.94	162059.28

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	9967.6550	24	<.0001
Score	10534.0580	24	<.0001
Wald	9783.7141	24	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
4583.2535	135	<.0001

Note: No effects for the model in Step 4 are removed.

Step 5. Effect NAME_CONTRACT_TYPE entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	161777.99
SC	172039.57	162054.45
-2 Log L	172026.94	161725.99

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	10300.9466	25	<.0001
Score	10823.5999	25	<.0001
Wald	10044.5794	25	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
4262.1168	134	<.0001

Note: No effects for the model in Step 5 are removed.

Step 6. Effect ORGANIZATION_TYPE entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	161458.36
SC	172039.57	162340.92
-2 Log L	172026.94	161292.36

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	10734.5709	82	<.0001
Score	11248.2368	82	<.0001
Wald	10405.0245	82	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
3847.1498	77	<.0001

Note: No effects for the model in Step 6 are removed.

Step 7. Effect DAYS_EMPLOYED entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	160942.09
SC	172039.57	161835.27
-2 Log L	172026.94	160774.09

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	11252.8471	83	<.0001
Score	11619.2848	83	<.0001
Wald	10736.3840	83	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
3356.8068	76	<.0001

Note: No effects for the model in Step 7 are removed.

Step 8. Effect FLAG_OWNER_CAR entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	160727.81
SC	172039.57	161631.63
-2 Log L	172026.94	160557.81

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	11469.1265	84	<.0001
Score	11847.8976	84	<.0001
Wald	10936.3342	84	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
3151.5847	75	<.0001

Note: No effects for the model in Step 8 are removed.

Step 9. Effect GENDER entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	160424.14
SC	172039.57	161349.23
-2 Log L	172026.94	160250.14

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	11776.7948	86	<.0001
Score	12195.7285	86	<.0001
Wald	11233.4683	86	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
2844.8556	73	<.0001

Note: No effects for the model in Step 9 are removed.

Step 10. Effect DAYS_ID_PUBLISH entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	160221.82
SC	172039.57	161157.54
-2 Log L	172026.94	160045.82

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	11981.1178	87	<.0001
Score	12412.2036	87	<.0001
Wald	11421.8526	87	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	
2639.0712	72	<.0001	

Note: No effects for the model in Step 10 are removed.

Step 11. Effect previous_apps entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		160038.10
SC	172039.57		160984.45
-2 Log L	172026.94		159860.10

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	12166.8388	88	<.0001
Score	12581.8749	88	<.0001
Wald	11568.9308	88	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	
2317.6850	71	<.0001	

Note: No effects for the model in Step 11 are removed.

Step 12. Effect approved_apps entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		159176.66
SC	172039.57		160133.64
-2 Log L	172026.94		158996.66

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13030.2768	89	<.0001
Score	13624.2144	89	<.0001
Wald	12374.1081	89	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	
1454.8712	70	<.0001	

Note: No effects for the model in Step 12 are removed.

Step 13. Effect REGION_RATING_CLIENT entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		159012.91
SC	172039.57		159980.53
-2 Log L	172026.94		158830.91

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13196.0215	90	<.0001
Score	13723.5099	90	<.0001
Wald	12465.1123	90	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
1289.6359	69	<.0001

Note: No effects for the model in Step 13 are removed.

Step 14. Effect FLAG_DOCUMENT_3 entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	158929.13
SC	172039.57	159907.38
-2 Log L	172026.94	158745.13

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13281.8068	91	<.0001
Score	13804.7044	91	<.0001
Wald	12533.7637	91	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
1214.0343	68	<.0001

Note: No effects for the model in Step 14 are removed.

Step 15. Effect NAME_INCOME_TYPE entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	158865.10
SC	172039.57	159917.79
-2 Log L	172026.94	158667.10

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13359.8331	98	<.0001
Score	13886.5775	98	<.0001
Wald	12590.1173	98	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
1117.4590	61	<.0001

Note: No effects for the model in Step 15 are removed.

Step 16. Effect Log_AMT_ANNUITY entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	158791.15
SC	172039.57	159854.47
-2 Log L	172026.94	158591.15

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13435.7856	99	<.0001
Score	13978.5530	99	<.0001
Wald	12665.6710	99	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
1051.6866	60	<.0001

Note: No effects for the model in Step 16 are removed.

Step 17. Effect NAME_FAMILY_STATUS entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158717.50
SC	172039.57		159823.35
-2 Log L	172026.94		158509.50

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13517.4390	103	<.0001
Score	14088.6411	103	<.0001
Wald	12752.5475	103	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
968.2297	56	<.0001

Note: No effects for the model in Step 17 are removed.

Step 18. Effect FLAG_DOCUMENT_16 entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158664.05
SC	172039.57		159780.54
-2 Log L	172026.94		158454.05

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13572.8808	104	<.0001
Score	14141.2927	104	<.0001
Wald	12796.9292	104	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
920.1148	55	<.0001

Note: No effects for the model in Step 18 are removed.

Step 19. Effect DAYS_REGISTRATION entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158618.28
SC	172039.57		159745.40
-2 Log L	172026.94		158406.28

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13620.6509	105	<.0001
Score	14175.9011	105	<.0001
Wald	12828.5309	105	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
872.8207	54	<.0001

Note: No effects for the model in Step 19 are removed.

Step 20. Effect DAYS_LAST_PHONE_CHAN entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158576.14
SC	172039.57		159713.89

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
-2 Log L	172026.94		158362.14

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13664.7944	106	<.0001
Score	14216.7383	106	<.0001
Wald	12862.0279	106	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	
828.2621	53	<.0001	

Note: No effects for the model in Step 20 are removed.

Step 21. Effect FLAG_DOCUMENT_18 entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158543.78
SC	172039.57		159692.16
-2 Log L	172026.94		158327.78

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13699.1545	107	<.0001
Score	14251.7175	107	<.0001
Wald	12891.8825	107	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	
798.7369	52	<.0001	

Note: No effects for the model in Step 21 are removed.

Step 22. Effect FLAG_DOCUMENT_13 entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158515.68
SC	172039.57		159674.69
-2 Log L	172026.94		158297.68

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13729.2574	108	<.0001
Score	14270.0816	108	<.0001
Wald	12905.2658	108	<.0001

Residual Chi-Square Test			
Chi-Square	DF	Pr > ChiSq	
774.6676	51	<.0001	

Note: No effects for the model in Step 22 are removed.

Step 23. Effect FLAG_DOCUMENT_6 entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158496.12
SC	172039.57		159665.77
-2 Log L	172026.94		158276.12

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13750.8109	109	<.0001
Score	14294.6312	109	<.0001

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Wald	12925.3124	109	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
755.2271	50	<.0001

Note: No effects for the model in Step 23 are removed.

Step 24. Effect FLAG_DOCUMENT_14 entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158475.54
SC	172039.57		159655.82
-2 Log L	172026.94		158253.54

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	13773.3982	110	<.0001	
Score	14311.7118	110	<.0001	
Wald	12938.8958	110	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
736.6474	49	<.0001

Note: No effects for the model in Step 24 are removed.

Step 25. Effect FLAG_DOCUMENT_2 entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158469.19
SC	172039.57		159660.11
-2 Log L	172026.94		158245.19

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	13781.7434	111	<.0001	
Score	14322.4382	111	<.0001	
Wald	12946.5959	111	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
720.8375	48	<.0001

Note: No effects for the model in Step 25 are removed.

Step 26. Effect FLAG_DOCUMENT_5 entered:

Model Convergence Status			
Convergence criterion (GCONV=1E-8) satisfied.			

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		158458.29
SC	172039.57		159659.84
-2 Log L	172026.94		158232.29

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	13794.6462	112	<.0001	
Score	14335.2264	112	<.0001	
Wald	12957.4066	112	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
707.5369	47	<.0001

Note: No effects for the model in Step 26 are removed.

Step 27. Effect FLAG_DOCUMENT_8 entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028,94	158437,11
SC	172039,57	159649,29
-2 Log L	172026,94	158209,11

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13817,8269	113	<.0001
Score	14351,1148	113	<.0001
Wald	12971,5260	113	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
685,4249	46	<.0001

Step 28. Effect NAME_CONTRACT_TYPE is removed:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028,94	158435,12
SC	172039,57	159636,67
-2 Log L	172026,94	158209,12

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13817,8186	112	<.0001
Score	14350,8067	112	<.0001
Wald	12971,4512	112	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
685,3838	47	<.0001

Note: No effects for the model in Step 28 are removed.

Step 29. Effect Log_AMT_CREDIT entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028,94	158422,21
SC	172039,57	159634,40
-2 Log L	172026,94	158194,21

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	13832,7206	113	<.0001
Score	14353,1999	113	<.0001
Wald	12970,8931	113	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
666,7767	46	<.0001

Note: No effects for the model in Step 29 are removed.

Step 30. Effect Log_AMT_GOODS_PRICE entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	157875.57
SC	172039.57	159098.38
-2 Log L	172026.94	157645.57

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	14381.3685	114	<.0001
Score	14966.0379	114	<.0001
Wald	13476.7135	114	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
112.8229	45	<.0001

Step 31. Effect FLAG_DOCUMENT_8 is removed:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	157876.83
SC	172039.57	159089.01
-2 Log L	172026.94	157648.83

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	14378.1073	113	<.0001
Score	14965.6653	113	<.0001
Wald	13480.1182	113	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
115.9058	46	<.0001

Note: No effects for the model in Step 31 are removed.

Step 32. Effect WEEKDAY_APPR_PROCESS entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	157865.72
SC	172039.57	159141.70
-2 Log L	172026.94	157625.72

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	14401.2155	119	<.0001
Score	14986.5131	119	<.0001
Wald	13497.6926	119	<.0001

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
92.8710	40	<.0001

Note: No effects for the model in Step 32 are removed.

Step 33. Effect FLAG_DOCUMENT_15 entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	172028.94	157854.55
SC	172039.57	159141.16
-2 Log L	172026.94	157612.55

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	14414.3883	120	<.0001	
Score	14995.6170	120	<.0001	
Wald	13504.8148	120	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
82.4688	39	<.0001

Note: No effects for the model in Step 33 are removed.

Step 34. Effect REGION_RATING_CLIENT entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		157849.60
SC	172039.57		159146.85
-2 Log L	172026.94		157605.60

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	14421.3366	121	<.0001	
Score	15007.8920	121	<.0001	
Wald	13513.7345	121	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
75.7498	38	0.0003

Note: No effects for the model in Step 34 are removed.

Step 35. Effect HOUR_APPR_PROCESS_ST entered:

Model Convergence Status		
Convergence criterion (GCONV=1E-8) satisfied.		

Model Fit Statistics			
Criterion	Intercept Only	Intercept and Covariates	
AIC	172028.94		157857.41
SC	172039.57		159399.22
-2 Log L	172026.94		157567.41

Testing Global Null Hypothesis: BETA=0				
Test	Chi-Square	DF	Pr > ChiSq	
Likelihood Ratio	14459.5223	144	<.0001	
Score	15044.9620	144	<.0001	
Wald	13542.9804	144	<.0001	

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
37.6936	15	0.0010

Note: No effects for the model in Step 35 are removed.

Note: No (additional) effects met the 0.05 significance level for entry into the model.

Summary of Stepwise Selection							
Step	Effect		DF	Number In	Score Chi-Square	Wald Chi-Square	Pr > ChiSq
	Entered	Removed					
1	CREDIT_SCORE_2		1	7905.5013			<.0001
2	OCCUPATION_TYPE		18	2	1457.5225		<.0001
3	DAYS_BIRTH		1	3	904.2232		<.0001
4	NAME_EDUCATION_TYPE		4	4	416.0206		<.0001
5	NAME_CONTRACT_TYPE		1	5	302.8216		<.0001
6	ORGANIZATION_TYPE		57	6	427.8275		<.0001
7	DAYS_EMPLOYED		1	7	481.0969		<.0001
8	FLAG_OWN_CAR		1	8	212.7071		<.0001
9	GENDER		2	9	311.1921		<.0001
10	DAYS_ID_PUBLISH		1	10	205.4301		<.0001
11	previous_apps		1	11	195.6220		<.0001
12	approved_apps		1	12	856.5480		<.0001
13	REGION_RATING_CLIENT		1	13	166.4822		<.0001
14	FLAG_DOCUMENT_3		1	14	84.1669		<.0001
15	NAME_INCOME_TYPE		7	15	97.1848		<.0001

Summary of Stepwise Selection							
Step	Effect		DF	Number In	Score Chi-Square	Wald Chi-Square	Pr > ChiSq
	Entered	Removed					
16	Log_AMT_ANNUITY		1	16	75.4634		<.0001
17	NAME_FAMILY_STATUS		4	17	82.8124		<.0001
18	FLAG_DOCUMENT_16		1	18	48.2948		<.0001
19	DAYS_REGISTRATION		1	19	47.5631		<.0001
20	DAYS_LAST_PHONE_CHAN		1	20	43.7057		<.0001
21	FLAG_DOCUMENT_18		1	21	30.7005		<.0001
22	FLAG_DOCUMENT_13		1	22	24.2835		<.0001
23	FLAG_DOCUMENT_6		1	23	21.6463		<.0001
24	FLAG_DOCUMENT_14		1	24	18.6506		<.0001
25	FLAG_DOCUMENT_2		1	25	15.9123		<.0001
26	FLAG_DOCUMENT_5		1	26	13.5110		0.0002
27	FLAG_DOCUMENT_8		1	27	22.8685		<.0001
28	NAME_CONTRACT_TYPE		1	26		0.0083	0.9273
29	Log_AMT_CREDIT		1	27	14.8637		0.0001
30	Log_AMT_GOODS_PRICE		1	28	554.7910		<.0001
31	FLAG_DOCUMENT_8		1	27		3.2609	0.0710
32	WEEKDAY_APPR_PROCESS		6	28	22.9903		0.0008
33	FLAG_DOCUMENT_15		1	29	10.4984		0.0012
34	REGION_RATING_CLIENT		1	30	6.6952		0.0097
35	HOUR_APPR_PROCESS_ST		23	31	38.0719		0.0250

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
NAME_FAMILY_STATUS	4	70.5388	<.0001
previous_apps	1	1012.7640	<.0001
CREDIT_SCORE_2	1	3928.0059	<.0001
GENDER	2	356.0072	<.0001
NAME_EDUCATION_TYPE	4	300.1877	<.0001
approved_apps	1	764.1037	<.0001
OCCUPATION_TYPE	18	98.2822	<.0001
WEEKDAY_APPR_PROCESS	6	23.9220	0.0005
ORGANIZATION_TYPE	57	234.7378	<.0001
FLAG_OWN_CAR	1	249.0401	<.0001
NAME_INCOME_TYPE	7	90.2760	<.0001
Log_AMT_CREDIT	1	610.9842	<.0001
Log_AMT_ANNUITY	1	56.0926	<.0001
Log_AMT_GOODS_PRICE	1	610.2364	<.0001
DAYS_BIRTH	1	206.3766	<.0001
DAYS_EMPLOYED	1	315.8176	<.0001
DAYS_REGISTRATION	1	46.7992	<.0001
DAYS_ID_PUBLISH	1	150.0002	<.0001
DAYS_LAST_PHONE_CHAN	1	39.6638	<.0001
FLAG_DOCUMENT_2	1	13.7788	0.0002
FLAG_DOCUMENT_3	1	134.2349	<.0001
FLAG_DOCUMENT_5	1	15.5657	<.0001
FLAG_DOCUMENT_6	1	22.5955	<.0001
FLAG_DOCUMENT_13	1	22.9154	<.0001
FLAG_DOCUMENT_14	1	17.6667	<.0001
FLAG_DOCUMENT_15	1	9.6863	0.0019
FLAG_DOCUMENT_16	1	55.8671	<.0001
FLAG_DOCUMENT_18	1	32.7393	<.0001
REGION_RATING_CLIENT	1	6.8553	0.0088
REGION_RATING_CLIENT	1	38.1884	<.0001
HOUR_APPR_PROCESS_ST	23	37.9166	0.0260

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-8.6363	55.2054	0.0245	0.8757
NAME_FAMILY_STATUS	Civil marriage	1	0.0492	0.0189	6.7900	0.0092
NAME_FAMILY_STATUS	Separated	1	0.0769	0.0232	11.0131	0.0009
NAME_FAMILY_STATUS	Single / not married	1	0.00718	0.0172	0.1754	0.6754
NAME_FAMILY_STATUS	Widow	1	-0.0478	0.0299	2.5605	0.1096
previous_apps		1	0.0677	0.00213	1012.7640	<.0001
CREDIT_SCORE_2		1	-0.00403	0.000064	3928.0059	<.0001
GENDER	M	1	3.0867	48.1818	0.0041	0.9489
GENDER	X	1	-5.8378	96.3637	0.0037	0.9517
NAME_EDUCATION_TYPE	Academic degree	1	-1.1070	0.4718	5.5061	0.0190
NAME_EDUCATION_TYPE	Incomplete higher	1	0.1865	0.1221	2.3330	0.1267
NAME_EDUCATION_TYPE	Lower secondary	1	0.4885	0.1260	15.0375	0.0001
NAME_EDUCATION_TYPE	Secondary / secondary special	1	0.3827	0.1189	10.3662	0.0013
approved_apps		1	-0.1378	0.00499	764.1037	<.0001
OCCUPATION_TYPE	Accountants	1	-0.2316	0.0501	21.3872	<.0001
OCCUPATION_TYPE	Cleaning staff	1	0.1120	0.0531	4.4456	0.0350
OCCUPATION_TYPE	Cooking staff	1	0.0811	0.0469	2.9916	0.0837
OCCUPATION_TYPE	Core staff	1	-0.0795	0.0334	5.6822	0.0171
OCCUPATION_TYPE	Drivers	1	0.1355	0.0326	17.2587	<.0001

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
OCCUPATION_TYPE	HR staff	1	0.0580	0.1681	0.1191	0.7300
OCCUPATION_TYPE	High skill tech staff	1	-0.1335	0.0429	9.7004	0.0018
OCCUPATION_TYPE	IT staff	1	-0.1455	0.1734	0.7047	0.4012
OCCUPATION_TYPE	Labors	1	0.0730	0.0250	8.5501	0.0035
OCCUPATION_TYPE	Low-skill Laborers	1	0.1987	0.0616	10.3981	0.0013
OCCUPATION_TYPE	Managers	1	-0.0202	0.0344	0.3452	0.5568
OCCUPATION_TYPE	Medicine staff	1	-0.0421	0.0568	0.5491	0.4587
OCCUPATION_TYPE	Private service staff	1	-0.1794	0.0818	4.8036	0.0284
OCCUPATION_TYPE	Realty agents	1	-0.0699	0.1378	0.2571	0.6121
OCCUPATION_TYPE	Sales staff	1	0.00508	0.0285	0.0318	0.8585
OCCUPATION_TYPE	Secretaries	1	0.0322	0.1073	0.0900	0.7642
OCCUPATION_TYPE	Security staff	1	0.1297	0.0503	6.6497	0.0099
OCCUPATION_TYPE	Waiters/barmen staff	1	0.0882	0.0878	1.0069	0.3156
WEEKDAY_APPR_PROCESS	FRIDAY	1	0.0302	0.0161	3.5425	0.0598
WEEKDAY_APPR_PROCESS	SATURDAY	1	-0.0378	0.0192	3.8789	0.0489
WEEKDAY_APPR_PROCESS	SUNDAY	1	-0.0483	0.0265	3.3300	0.0680
WEEKDAY_APPR_PROCESS	THURSDAY	1	0.0187	0.0160	1.3548	0.2444
WEEKDAY_APPR_PROCESS	TUESDAY	1	0.0419	0.0155	7.3028	0.0069
WEEKDAY_APPR_PROCESS	WEDNESDAY	1	0.0324	0.0159	4.1652	0.0413
ORGANIZATION_TYPE	Advertising	1	0.5871	1.6755	0.1228	0.7260
ORGANIZATION_TYPE	Agriculture	1	0.5028	1.6674	0.0909	0.7630
ORGANIZATION_TYPE	Bank	1	0.1759	1.6685	0.0111	0.9160
ORGANIZATION_TYPE	Business Entity Type 1	1	0.4027	1.6667	0.0584	0.8091
ORGANIZATION_TYPE	Business Entity Type 2	1	0.4409	1.6664	0.0700	0.7913
ORGANIZATION_TYPE	Business Entity Type 3	1	0.4883	1.6661	0.0859	0.7695
ORGANIZATION_TYPE	Cleaning	1	0.5277	1.6783	0.0988	0.7532
ORGANIZATION_TYPE	Construction	1	0.6245	1.6665	0.1404	0.7078
ORGANIZATION_TYPE	Culture	1	0.3749	1.6812	0.0497	0.8235
ORGANIZATION_TYPE	Electricity	1	0.2753	1.6713	0.0271	0.8691
ORGANIZATION_TYPE	Emergency	1	0.2891	1.6743	0.0298	0.8629
ORGANIZATION_TYPE	Hotel	1	0.1836	1.6713	0.0121	0.9125
ORGANIZATION_TYPE	Housing	1	0.4123	1.6675	0.0611	0.8047
ORGANIZATION_TYPE	Industry: type 1	1	0.5396	1.6691	0.1045	0.7465
ORGANIZATION_TYPE	Industry: type 10	1	0.1314	1.7122	0.0059	0.9388
ORGANIZATION_TYPE	Industry: type 11	1	0.4271	1.6675	0.0656	0.7979
ORGANIZATION_TYPE	Industry: type 12	1	-0.2731	1.6881	0.0262	0.8715
ORGANIZATION_TYPE	Industry: type 13	1	0.3956	1.7062	0.0538	0.8166
ORGANIZATION_TYPE	Industry: type 2	1	0.1544	1.6761	0.0085	0.9266
ORGANIZATION_TYPE	Industry: type 3	1	0.5493	1.6670	0.1086	0.7418
ORGANIZATION_TYPE	Industry: type 4	1	0.4447	1.6699	0.0709	0.7900
ORGANIZATION_TYPE	Industry: type 5	1	0.1176	1.6741	0.0049	0.9440
ORGANIZATION_TYPE	Industry: type 6	1	0.2512	1.7062	0.0217	0.8830
ORGANIZATION_TYPE	Industry: type 7	1	0.3637	1.6693	0.0475	0.8275
ORGANIZATION_TYPE	Industry: type 8	1	0.7295	1.7782	0.1683	0.6816
ORGANIZATION_TYPE	Industry: type 9	1	0.1255	1.6675	0.0057	0.9400
ORGANIZATION_TYPE	Insurance	1	0.3928	1.6754	0.0550	0.8146
ORGANIZATION_TYPE	Kindergarten	1	0.3810	1.6668	0.0522	0.8192
ORGANIZATION_TYPE	Legal Services	1	0.9103	1.6798	0.2936	0.5879
ORGANIZATION_TYPE	Medicine	1	0.3933	1.6668	0.0557	0.8135
ORGANIZATION_TYPE	Military	1	-0.0440	1.6685	0.0007	0.9790
ORGANIZATION_TYPE	Mobile	1	0.4688	1.6778	0.0781	0.7799
ORGANIZATION_TYPE	Other	1	0.4017	1.6663	0.0581	0.8095
ORGANIZATION_TYPE	Police	1	0.1324	1.6690	0.0063	0.9368
ORGANIZATION_TYPE	Postal	1	0.5175	1.6679	0.0963	0.7564
ORGANIZATION_TYPE	Realtor	1	0.9846	1.6747	0.3457	0.5566
ORGANIZATION_TYPE	Religion	1	0.3464	1.7282	0.0402	0.8412
ORGANIZATION_TYPE	Restaurant	1	0.5332	1.6678	0.1022	0.7492
ORGANIZATION_TYPE	School	1	0.3081	1.6667	0.0342	0.8533
ORGANIZATION_TYPE	Security	1	0.3229	1.6675	0.0375	0.8465
ORGANIZATION_TYPE	Security Ministries	1	0.0819	1.6694	0.0024	0.8609
ORGANIZATION_TYPE	Self-employed	1	0.5295	1.6661	0.1010	0.7506
ORGANIZATION_TYPE	Services	1	0.3534	1.6695	0.0448	0.8324
ORGANIZATION_TYPE	Telecom	1	0.5040	1.6736	0.0907	0.7633
ORGANIZATION_TYPE	Trade: type 1	1	0.3595	1.6772	0.0459	0.8303
ORGANIZATION_TYPE	Trade: type 2	1	0.0649	1.6686	0.0015	0.9690
ORGANIZATION_TYPE	Trade: type 3	1	0.5915	1.6670	0.1259	0.7227
ORGANIZATION_TYPE	Trade: type 4	1	-0.6035	1.8118	0.1109	0.7391
ORGANIZATION_TYPE	Trade: type 5	1	0.2381	1.7697	0.0181	0.8930
ORGANIZATION_TYPE	Trade: type 6	1	0.00893	1.6769	0.0000	0.9958
ORGANIZATION_TYPE	Trade: type 7	1	0.4776	1.6665	0.0821	0.7744
ORGANIZATION_TYPE	Transport: type 1	1	-0.1598	1.7003	0.0088	0.9251
ORGANIZATION_TYPE	Transport: type 2	1	0.3314	1.6681	0.0395	0.8425
ORGANIZATION_TYPE	Transport: type 3	1	0.9174	1.6681	0.3024	0.5824
ORGANIZATION_TYPE	Transport: type 4	1	0.4401	1.6667	0.0697	0.7917
ORGANIZATION_TYPE	University	1	0.2425	1.6710	0.0211	0.8846
ORGANIZATION_TYPE	XNA	1	-20.0606	94.9491	0.0446	0.8327
FLAG_OWN_CAR	N	1	0.1279	0.00811	249.0401	<.0001
NAME_INCOME_TYPE	Businessman	1	-4.6032	90.9764	0.0026	0.9596
NAME_INCOME_TYPE	Commercial associate	1	3.4337	28.3511	0.0147	0.9036

Analysis of Maximum Likelihood Estimates					
Parameter		DF	Estimate	Standard Error	Wald Chi-Square
NAME_INCOME_TYPE	Maternity leave	1	6.3580	28.3630	0.0503
NAME_INCOME_TYPE	Pensioner	1	-4.5264	73.9575	0.0037
NAME_INCOME_TYPE	State servant	1	3.4286	28.3511	0.0146
NAME_INCOME_TYPE	Student	1	-5.5351	62.5795	0.0078
NAME_INCOME_TYPE	Working	1	3.5542	28.3511	0.0157
Log_AMT_CREDIT		1	1.5814	0.0640	610.9842
Log_AMT_ANNUITY		1	0.1885	0.0252	56.0926
Log_AMT_GOODS_PRICE		1	-1.5984	0.0647	610.2364
DAYS_BIRTH		1	0.000033	2.304E-6	206.3766
DAYS_EMPLOYED		1	0.000077	4.345E-6	315.8176
DAYS_REGISTRATION		1	0.000015	2.183E-6	46.7992
DAYS_ID_PUBLISH		1	0.000058	4.756E-6	150.0002
DAYS_LAST_PHONE_CHAN		1	0.000059	9.368E-6	39.6638
FLAG_DOCUMENT_2		1	2.3079	0.6218	13.7788
FLAG_DOCUMENT_3		1	0.2415	0.0208	134.2349
FLAG_DOCUMENT_5		1	0.2347	0.0595	15.5657
FLAG_DOCUMENT_6		1	0.1911	0.0402	22.5955
FLAG_DOCUMENT_13		1	-0.8980	0.1876	22.9154
FLAG_DOCUMENT_14		1	-0.7915	0.1883	17.6667
FLAG_DOCUMENT_15		1	-0.9653	0.3102	9.6863
FLAG_DOCUMENT_16		1	-0.6422	0.0859	55.8671
FLAG_DOCUMENT_18		1	-0.5102	0.0892	32.7393
REGION_RATING_CLIENT		1	-0.1209	0.0462	6.8553
REGION_RATING_CLIENT		1	0.2857	0.0462	38.1884
HOUR_APPR_PROCESS_ST	1	1	-0.0490	0.3877	0.0160
HOUR_APPR_PROCESS_ST	2	1	0.1150	0.1937	0.3523
HOUR_APPR_PROCESS_ST	3	1	-0.1507	0.1072	1.9746
HOUR_APPR_PROCESS_ST	4	1	-0.2596	0.0876	8.7812
HOUR_APPR_PROCESS_ST	5	1	-0.0789	0.0664	1.4100
HOUR_APPR_PROCESS_ST	6	1	-0.0183	0.0571	0.1030
HOUR_APPR_PROCESS_ST	7	1	-0.0376	0.0520	0.5236
HOUR_APPR_PROCESS_ST	8	1	-0.0610	0.0477	1.6367
HOUR_APPR_PROCESS_ST	9	1	-0.0838	0.0441	3.6064
HOUR_APPR_PROCESS_ST	10	1	-0.0653	0.0427	2.3419
HOUR_APPR_PROCESS_ST	11	1	-0.0377	0.0427	0.7816
HOUR_APPR_PROCESS_ST	12	1	-0.0101	0.0430	0.0558
HOUR_APPR_PROCESS_ST	13	1	-0.0225	0.0435	0.2676
HOUR_APPR_PROCESS_ST	14	1	-0.0229	0.0442	0.2687
HOUR_APPR_PROCESS_ST	15	1	-0.0387	0.0450	0.7392
HOUR_APPR_PROCESS_ST	16	1	-0.0526	0.0465	1.2790
HOUR_APPR_PROCESS_ST	17	1	-0.1722	0.0504	11.6570
HOUR_APPR_PROCESS_ST	18	1	-0.0619	0.0559	1.2269
HOUR_APPR_PROCESS_ST	19	1	-0.00488	0.0738	0.0044
HOUR_APPR_PROCESS_ST	20	1	0.00196	0.1175	0.0003
HOUR_APPR_PROCESS_ST	21	1	-0.2142	0.2050	1.0913
HOUR_APPR_PROCESS_ST	22	1	0.2387	0.2714	0.7735
HOUR_APPR_PROCESS_ST	23	1	0.3965	0.4788	0.6858
					0.4076

Odds Ratio Estimates			
Effect		Point Estimate	95% Wald Confidence Limits
NAME_FAMILY_STATUS Civil marriage vs Married		1.144	1.096 1.195
NAME_FAMILY_STATUS Separated vs Married		1.176	1.113 1.244
NAME_FAMILY_STATUS Single / not married vs Married		1.097	1.056 1.140
NAME_FAMILY_STATUS Widow vs Married		1.038	0.965 1.117
previous_apps		1.070	1.066 1.075
CREDIT_SCORE_2		0.996	0.996 0.996
GENDER M vs F		1.399	1.351 1.448
GENDER X vs F		<0.001	<0.001 >999.999
NAME_EDUCATION_TYPE Academic degree vs Higher education		0.315	0.099 1.000
NAME_EDUCATION_TYPE Incomplete higher vs Higher education		1.147	1.060 1.242
NAME_EDUCATION_TYPE Lower secondary vs Higher education		1.552	1.386 1.737
NAME_EDUCATION_TYPE Secondary / secondary special vs Higher education		1.396	1.342 1.452
approved_apps		0.871	0.863 0.880
OCCUPATION_TYPE Accountants vs Other		0.803	0.725 0.890
OCCUPATION_TYPE Cleaning staff vs Other		1.132	1.015 1.262
OCCUPATION_TYPE Cooking staff vs Other		1.098	0.997 1.209
OCCUPATION_TYPE Core staff vs Other		0.935	0.873 1.001
OCCUPATION_TYPE Drivers vs Other		1.159	1.086 1.237
OCCUPATION_TYPE HR staff vs Other		1.072	0.757 1.519
OCCUPATION_TYPE High skill tech staff vs Other		0.886	0.812 0.966
OCCUPATION_TYPE IT staff vs Other		0.875	0.611 1.253
OCCUPATION_TYPE Laborers vs Other		1.089	1.037 1.142
OCCUPATION_TYPE Low-skill Laborers vs Other		1.234	1.088 1.400
OCCUPATION_TYPE Managers vs Other		0.992	0.925 1.063
OCCUPATION_TYPE Medicine staff vs Other		0.970	0.863 1.091
OCCUPATION_TYPE Private service staff vs Other		0.846	0.714 1.002
OCCUPATION_TYPE Realty agents vs Other		0.944	0.709 1.256
OCCUPATION_TYPE Sales staff vs Other		1.017	0.960 1.077

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
OCCUPATION_TYPE Secretaries vs Other	1.045	0.837	1.305
OCCUPATION_TYPE Security staff vs Other	1.152	1.040	1.276
OCCUPATION_TYPE Waiters/barmen staff vs Other	1.105	0.922	1.325
WEEKDAY_APPR_PROCESS FRIDAY vs MONDAY	1.070	1.020	1.121
WEEKDAY_APPR_PROCESS SATURDAY vs MONDAY	0.999	0.948	1.054
WEEKDAY_APPR_PROCESS SUNDAY vs MONDAY	0.989	0.924	1.058
WEEKDAY_APPR_PROCESS THURSDAY vs MONDAY	1.057	1.009	1.108
WEEKDAY_APPR_PROCESS TUESDAY vs MONDAY	1.082	1.034	1.133
WEEKDAY_APPR_PROCESS WEDNESDAY vs MONDAY	1.072	1.023	1.123
ORGANIZATION_TYPE Advertising vs Government	1.215	0.844	1.750
ORGANIZATION_TYPE Agriculture vs Government	1.117	0.956	1.305
ORGANIZATION_TYPE Bank vs Government	0.805	0.660	0.983
ORGANIZATION_TYPE Business Entity Type 1 vs Government	1.010	0.892	1.145
ORGANIZATION_TYPE Business Entity Type 2 vs Government	1.050	0.943	1.168
ORGANIZATION_TYPE Business Entity Type 3 vs Government	1.101	1.011	1.198
ORGANIZATION_TYPE Cleaning vs Government	1.145	0.757	1.731
ORGANIZATION_TYPE Construction vs Government	1.261	1.127	1.412
ORGANIZATION_TYPE Culture vs Government	0.983	0.624	1.549
ORGANIZATION_TYPE Electricity vs Government	0.890	0.676	1.171
ORGANIZATION_TYPE Emergency vs Government	0.902	0.642	1.266
ORGANIZATION_TYPE Hotel vs Government	0.812	0.616	1.069
ORGANIZATION_TYPE Housing vs Government	1.020	0.870	1.196
ORGANIZATION_TYPE Industry: type 1 vs Government	1.159	0.933	1.439
ORGANIZATION_TYPE Industry: type 10 vs Government	0.770	0.349	1.701
ORGANIZATION_TYPE Industry: type 11 vs Government	1.035	0.882	1.215
ORGANIZATION_TYPE Industry: type 12 vs Government	0.514	0.297	0.890
ORGANIZATION_TYPE Industry: type 13 vs Government	1.003	0.479	2.099
ORGANIZATION_TYPE Industry: type 2 vs Government	0.788	0.542	1.146
ORGANIZATION_TYPE Industry: type 3 vs Government	1.170	1.017	1.346
ORGANIZATION_TYPE Industry: type 4 vs Government	1.054	0.828	1.341
ORGANIZATION_TYPE Industry: type 5 vs Government	0.760	0.543	1.063
ORGANIZATION_TYPE Industry: type 6 vs Government	0.868	0.415	1.818
ORGANIZATION_TYPE Industry: type 7 vs Government	0.972	0.779	1.212
ORGANIZATION_TYPE Industry: type 8 vs Government	1.401	0.404	4.853
ORGANIZATION_TYPE Industry: type 9 vs Government	0.766	0.652	0.900
ORGANIZATION_TYPE Insurance vs Government	1.000	0.696	1.437
ORGANIZATION_TYPE Kindergarten vs Government	0.989	0.873	1.120
ORGANIZATION_TYPE Legal Services vs Government	1.678	1.086	2.594
ORGANIZATION_TYPE Medicine vs Government	1.001	0.884	1.133
ORGANIZATION_TYPE Military vs Government	0.646	0.532	0.785
ORGANIZATION_TYPE Mobile vs Government	1.079	0.721	1.617
ORGANIZATION_TYPE Other vs Government	1.009	0.915	1.114
ORGANIZATION_TYPE Police vs Government	0.771	0.626	0.949
ORGANIZATION_TYPE Postal vs Government	1.133	0.951	1.351
ORGANIZATION_TYPE Realtor vs Government	1.808	1.274	2.565
ORGANIZATION_TYPE Religion vs Government	0.955	0.381	2.395
ORGANIZATION_TYPE Restaurant vs Government	1.151	0.968	1.369
ORGANIZATION_TYPE School vs Government	0.919	0.815	1.036
ORGANIZATION_TYPE Security vs Government	0.933	0.795	1.095
ORGANIZATION_TYPE Security Ministries vs Government	0.733	0.586	0.917
ORGANIZATION_TYPE Self-employed vs Government	1.147	1.050	1.253
ORGANIZATION_TYPE Services vs Government	0.962	0.764	1.210
ORGANIZATION_TYPE Telecom vs Government	1.118	0.807	1.550
ORGANIZATION_TYPE Trade: type 1 vs Government	0.968	0.653	1.435
ORGANIZATION_TYPE Trade: type 2 vs Government	0.721	0.589	0.882
ORGANIZATION_TYPE Trade: type 3 vs Government	1.220	1.061	1.403
ORGANIZATION_TYPE Trade: type 4 vs Government	0.369	0.089	1.532
ORGANIZATION_TYPE Trade: type 5 vs Government	0.857	0.260	2.826
ORGANIZATION_TYPE Trade: type 6 vs Government	0.682	0.462	1.005
ORGANIZATION_TYPE Trade: type 7 vs Government	1.089	0.972	1.220
ORGANIZATION_TYPE Transport: type 1 vs Government	0.576	0.291	1.139
ORGANIZATION_TYPE Transport: type 2 vs Government	0.941	0.786	1.126
ORGANIZATION_TYPE Transport: type 3 vs Government	1.690	1.405	2.034
ORGANIZATION_TYPE Transport: type 4 vs Government	1.049	0.926	1.188
ORGANIZATION_TYPE University vs Government	0.861	0.660	1.124
ORGANIZATION_TYPE XNA vs Government	<0.001	<0.001	>999.999
FLAG_own_car_N vs Y	1.292	1.251	1.333
NAME_INCOME_TYPE Businessman vs Unemployed	0.083	<0.001	>999.999
NAME_INCOME_TYPE Commercial associate vs Unemployed	255.545	<0.001	>999.999
NAME_INCOME_TYPE Maternity leave vs Unemployed	>999.999	<0.001	>999.999
NAME_INCOME_TYPE Pensioner vs Unemployed	0.089	0.035	0.227
NAME_INCOME_TYPE State servant vs Unemployed	254.242	<0.001	>999.999
NAME_INCOME_TYPE Student vs Unemployed	0.033	<0.001	>999.999
NAME_INCOME_TYPE Working vs Unemployed	288.274	<0.001	>999.999
Log_AMT_CREDIT	4.862	4.289	5.511
Log_AMT_ANNUITY	1.207	1.149	1.268
Log_AMT_GOODS_PRICE	0.202	0.178	0.230
DAYS_BIRTH	1.000	1.000	1.000
DAYS_EMPLOYED	1.000	1.000	1.000

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
DAYS_REGISTRATION	1.000	1.000	1.000
DAYS_ID_PUBLISH	1.000	1.000	1.000
DAYS_LAST_PHONE_CHAN	1.000	1.000	1.000
FLAG_DOCUMENT_2	10.054	2.972	34.007
FLAG_DOCUMENT_3	1.273	1.222	1.326
FLAG_DOCUMENT_5	1.265	1.125	1.421
FLAG_DOCUMENT_6	1.211	1.119	1.310
FLAG_DOCUMENT_13	0.407	0.282	0.588
FLAG_DOCUMENT_14	0.453	0.313	0.655
FLAG_DOCUMENT_15	0.381	0.207	0.699
FLAG_DOCUMENT_16	0.526	0.445	0.623
FLAG_DOCUMENT_18	0.600	0.504	0.715
REGION_RATING_CLIENT	0.886	0.809	0.970
REGION_RATING_CLIENT	1.331	1.215	1.457
HOUR_APPR_PROCESS_ST 1 vs 0	0.478	0.142	1.608
HOUR_APPR_PROCESS_ST 2 vs 0	0.563	0.207	1.531
HOUR_APPR_PROCESS_ST 3 vs 0	0.432	0.168	1.110
HOUR_APPR_PROCESS_ST 4 vs 0	0.387	0.152	0.987
HOUR_APPR_PROCESS_ST 5 vs 0	0.464	0.183	1.174
HOUR_APPR_PROCESS_ST 6 vs 0	0.493	0.195	1.244
HOUR_APPR_PROCESS_ST 7 vs 0	0.483	0.192	1.218
HOUR_APPR_PROCESS_ST 8 vs 0	0.472	0.187	1.189
HOUR_APPR_PROCESS_ST 9 vs 0	0.461	0.183	1.161
HOUR_APPR_PROCESS_ST 10 vs 0	0.470	0.187	1.183
HOUR_APPR_PROCESS_ST 11 vs 0	0.483	0.192	1.216
HOUR_APPR_PROCESS_ST 12 vs 0	0.497	0.197	1.250
HOUR_APPR_PROCESS_ST 13 vs 0	0.491	0.195	1.235
HOUR_APPR_PROCESS_ST 14 vs 0	0.490	0.195	1.234
HOUR_APPR_PROCESS_ST 15 vs 0	0.483	0.192	1.215
HOUR_APPR_PROCESS_ST 16 vs 0	0.476	0.189	1.199
HOUR_APPR_PROCESS_ST 17 vs 0	0.422	0.168	1.064
HOUR_APPR_PROCESS_ST 18 vs 0	0.472	0.187	1.190
HOUR_APPR_PROCESS_ST 19 vs 0	0.499	0.197	1.266
HOUR_APPR_PROCESS_ST 20 vs 0	0.503	0.195	1.299
HOUR_APPR_PROCESS_ST 21 vs 0	0.405	0.148	1.112
HOUR_APPR_PROCESS_ST 22 vs 0	0.637	0.218	1.863
HOUR_APPR_PROCESS_ST 23 vs 0	0.746	0.195	2.858

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	71.6	Somers' D	0.433
Percent Discordant	28.4	Gamma	0.433
Percent Tied	0.0	Tau-a	0.064
Pairs	6975361120	c	0.716