EDA ASSIGNMENT

RANJANA KUMARI

CONTENT

Challenge statement

Target 0 aims to identify clients who are expected to have a high likelihood of loan repayment, but declining their loan application may lead to a missed business opportunity for the company.

Target 1, on the other hand, aims to identify clients who have missed at least one installment payment by more than X days. This helps in detecting clients who may be at a higher risk of defaulting on their loan in the future, allowing the company to take necessary measures to reduce their credit risk.

objective

- In this case study, exploratory data analysis (EDA) will be employed to examine how consumer and loan attributes impact the probability of loan default. The loan application process includes four potential outcomes: approval, cancellation, refusal, and unused offer. Approval refers to the company's acceptance of the loan application, while cancellation occurs when the client decides not to proceed with the loan or receives unfavorable pricing due to increased risk. Refusal refers to the rejection of the loan application by the company, usually due to the client's failure to meet their requirements. Finally, an unused offer refers to a loan that was cancelled by the client at various stages of the of the process.

Action plan

1. Getting Information and Understanding.
2. Issues with binning and data quality.
3. Data imbalance, correlation, and univariate, segmented univariate, and bivariate analysis.
4. Applying previous data to application data.
5. Analysis employing segmented univariate analysis, bivariate analysis, and correlation.
6. Risks and Recommendations

Data Analysis:- Data comprehension

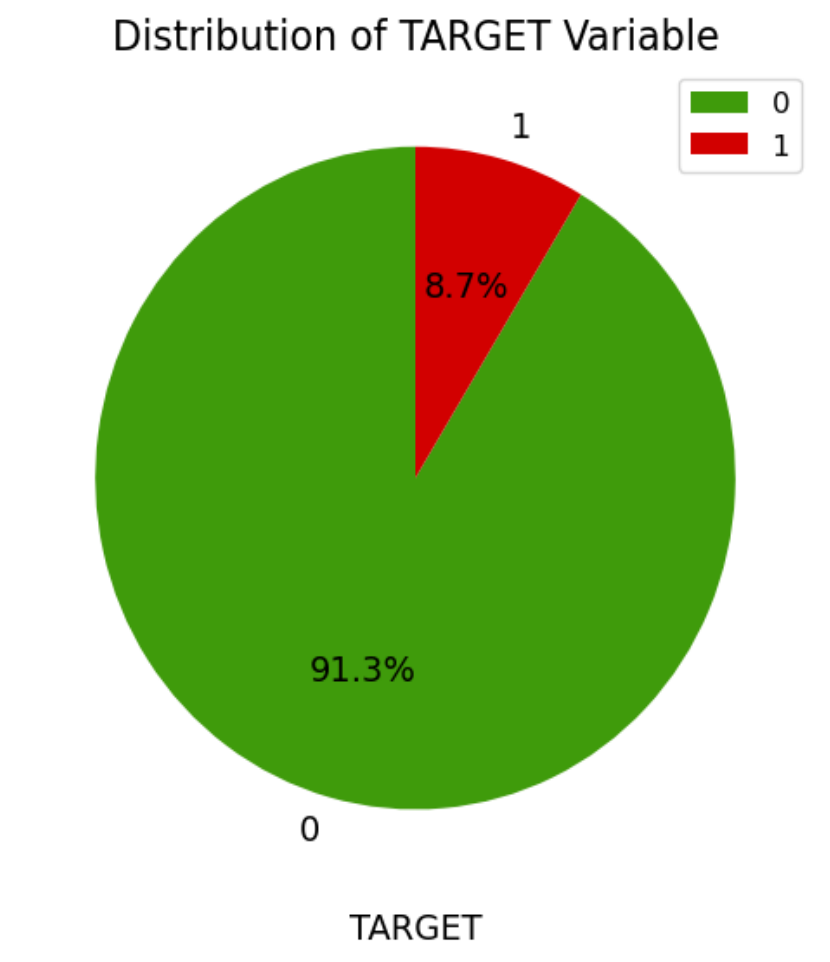
- The available data for this study consists of three CSV files. The first file, 'application_data.csv', includes client information at the time of their loan application, specifically whether they had payment difficulties or not. The second file, 'previous_application.csv', provides data on the client's previous loan applications, indicating whether they were approved, cancelled, refused, or had an unused offer. Finally, the 'columns_description.csv' file serves as a data dictionary, explaining the meaning of the variables used in the other two files.

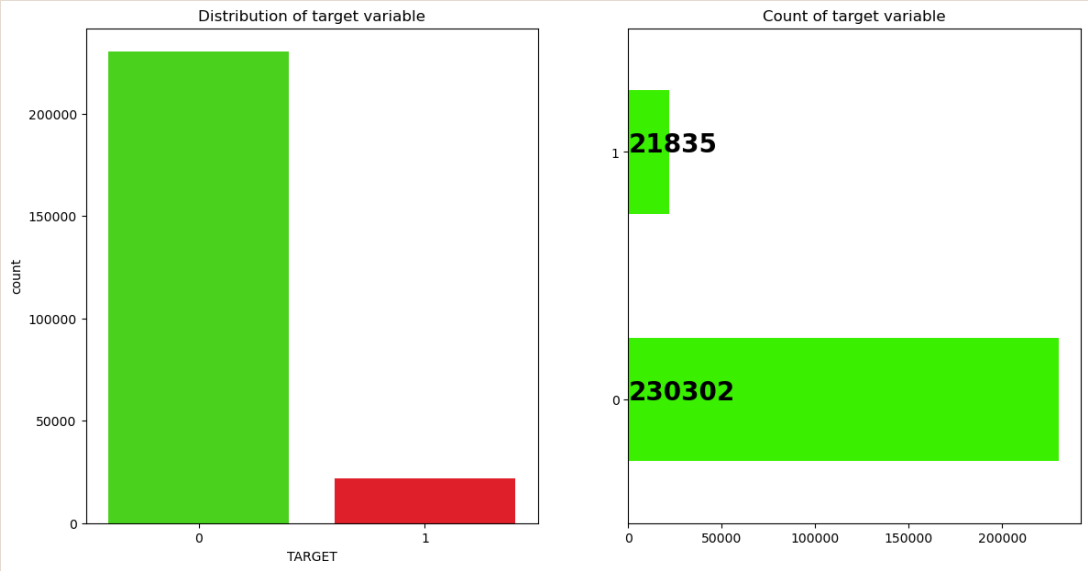
DATA CLEANING AND FORMATTING

- 1. Analyze the data to find outliers, abnormalities, and missing values.
- 2. Deal with missing data by either eliminating them from the dataset or imputing them.
- 3. Identify outliers and abnormalities, then get rid of or alter them as needed.
- 4. Identify duplicate records in the dataset and remove them.
- 5. If required, standardize or normalize the data to make it simpler to compare and analyze.
- 6. Check for inconsistencies and errors in the data by validating against external sources or using domain knowledge.
- 7. If required, convert data types to ensure that the data is in the proper format for analysis.
- 8. Create new variables from the existing data, if necessary, to gain more insights or improve predictive accuracy

DATA SKEWNESS

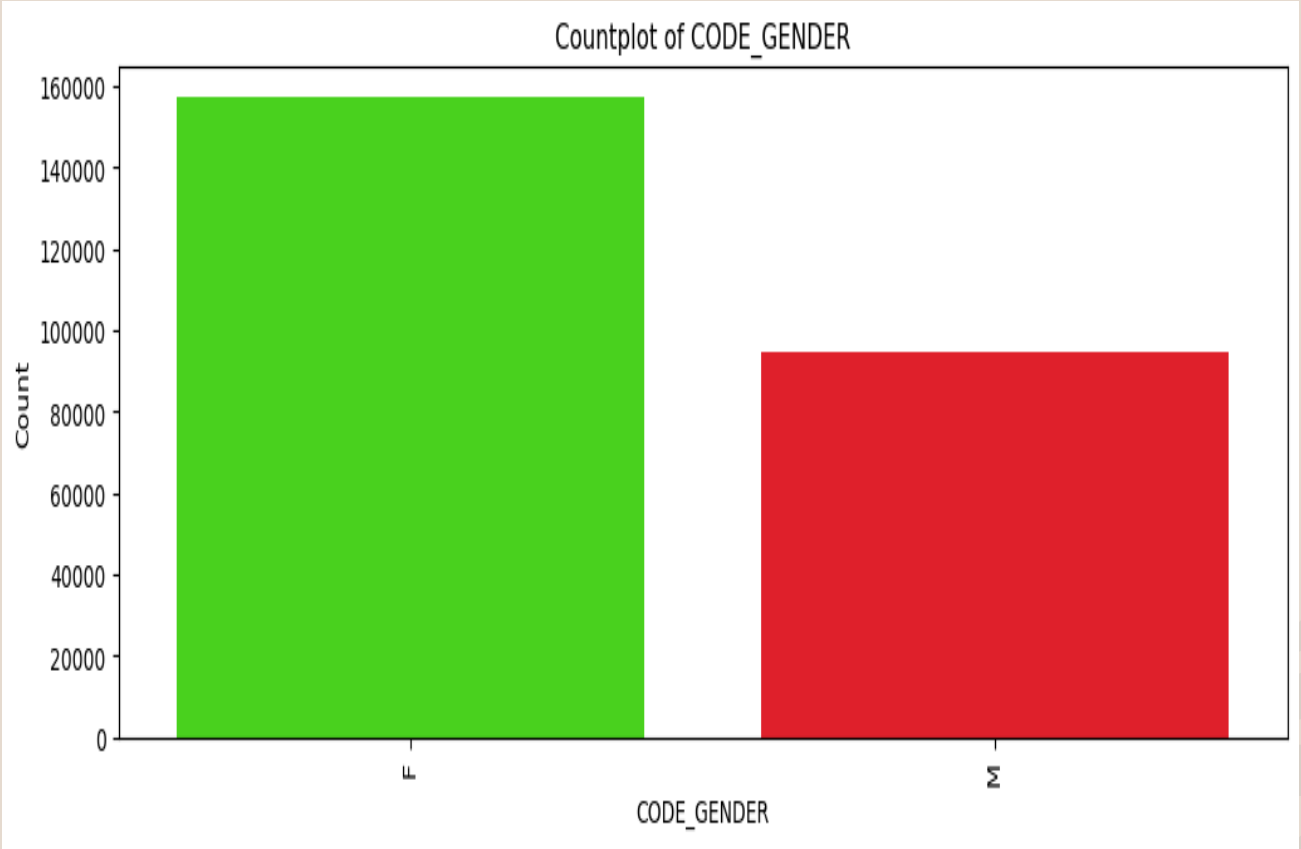
- 91.3% Applicants are non defaulters
- 8.7% have issues with loan repayment





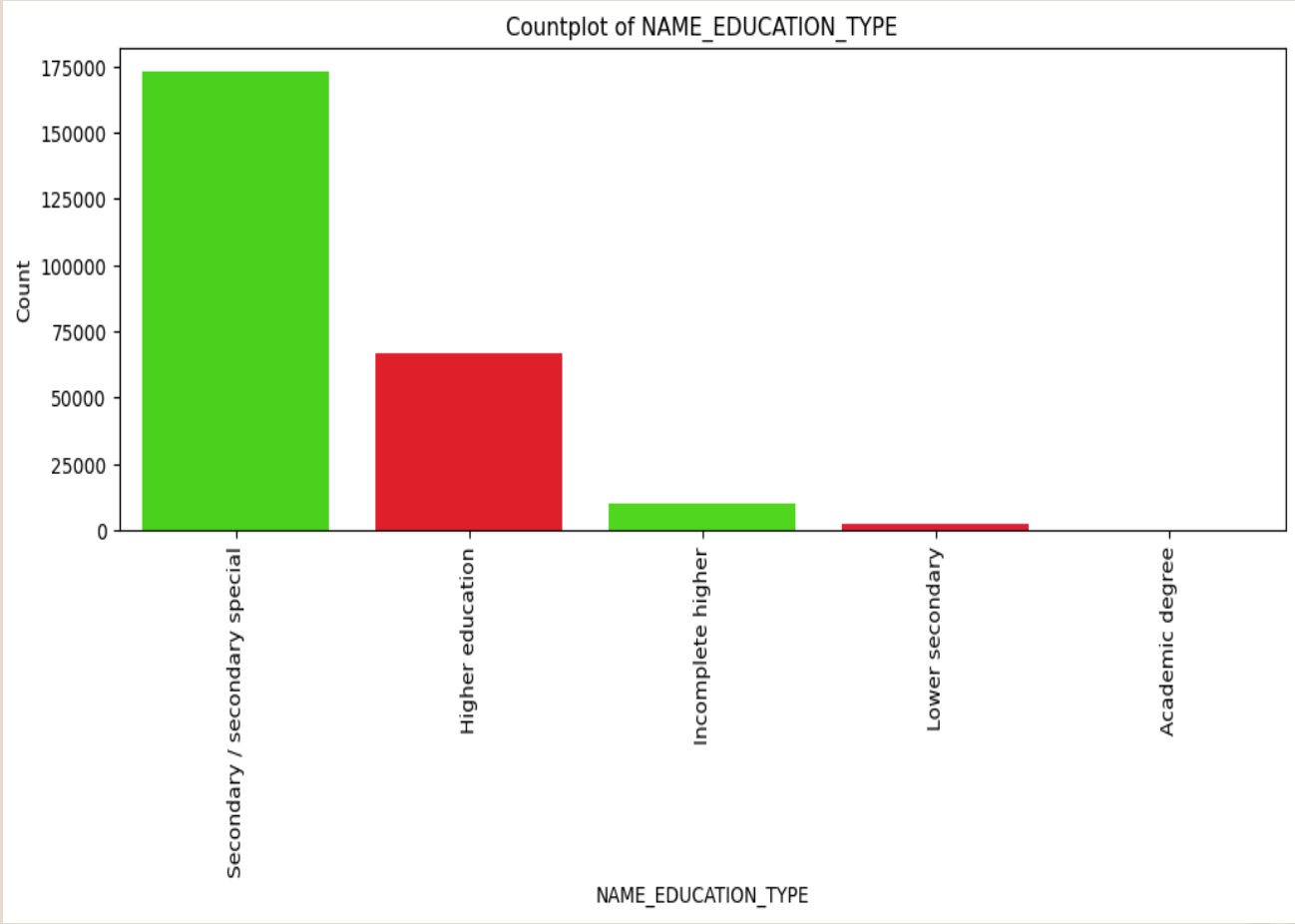
Univariate ananlysis Gender

There is a higher frequency of loan applications from females compared to males, possibly due to a lower interest rate charged by banks for female applicants.



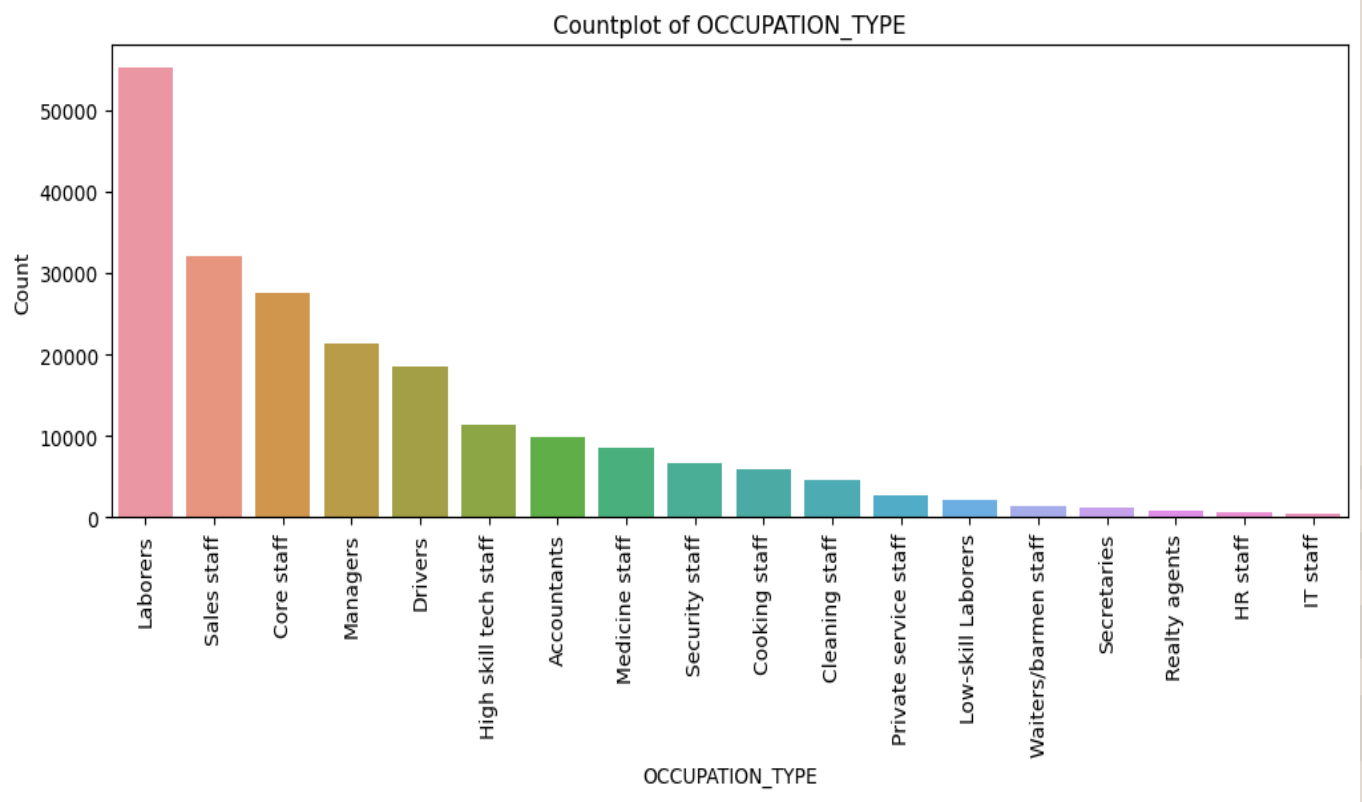
Univariate analysis Education type

The majority of loan applicants, approximately 71%, have a Secondary/Secondary Special education type

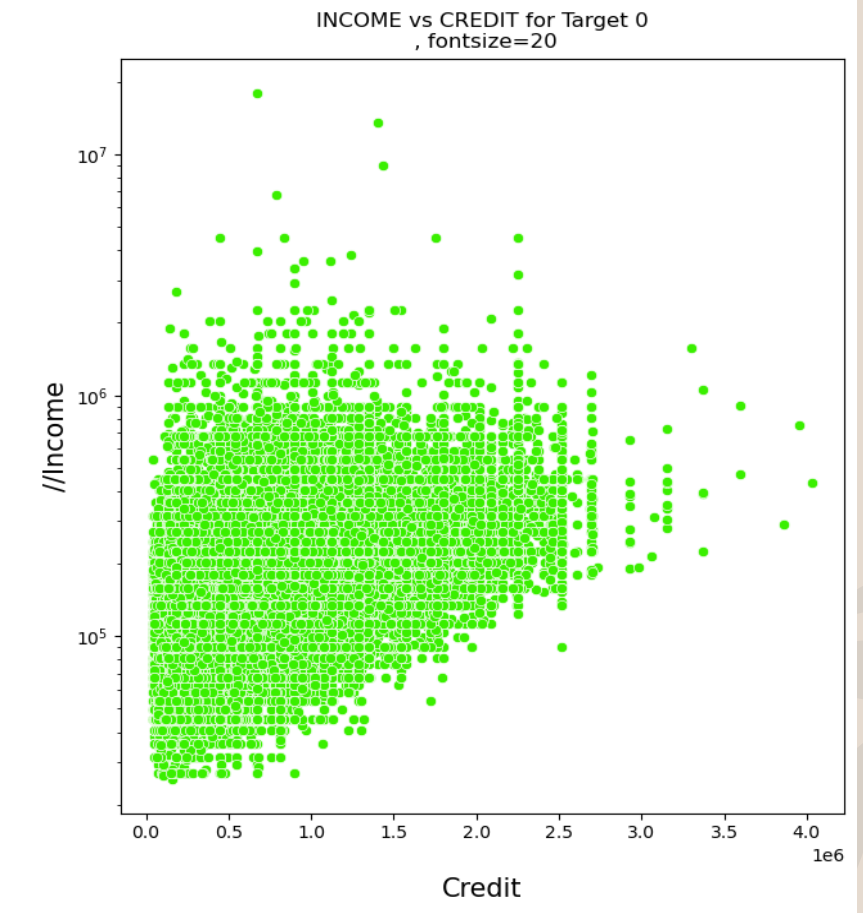


Univariate : Occupation type

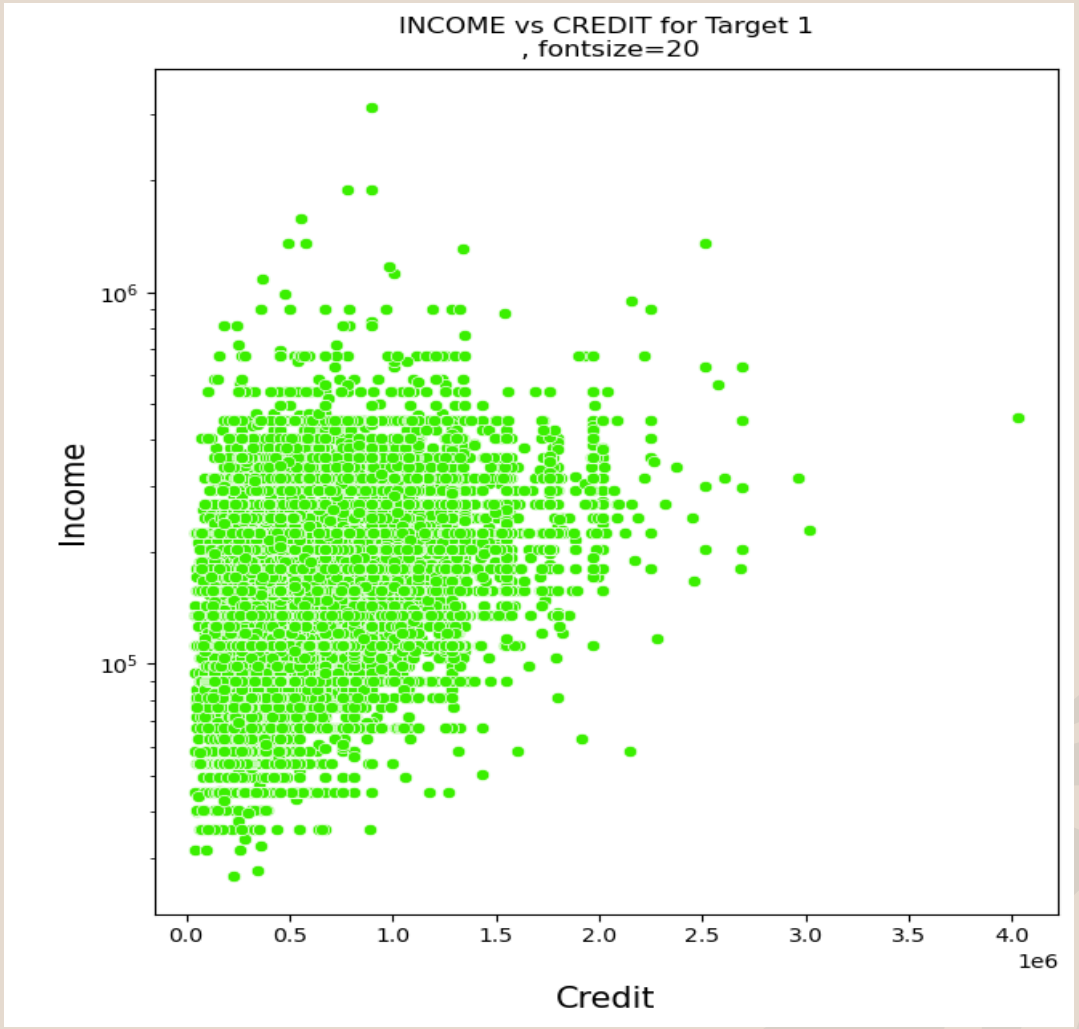
There is higher frequency loan application for the laborers occupation type possibly due to low income



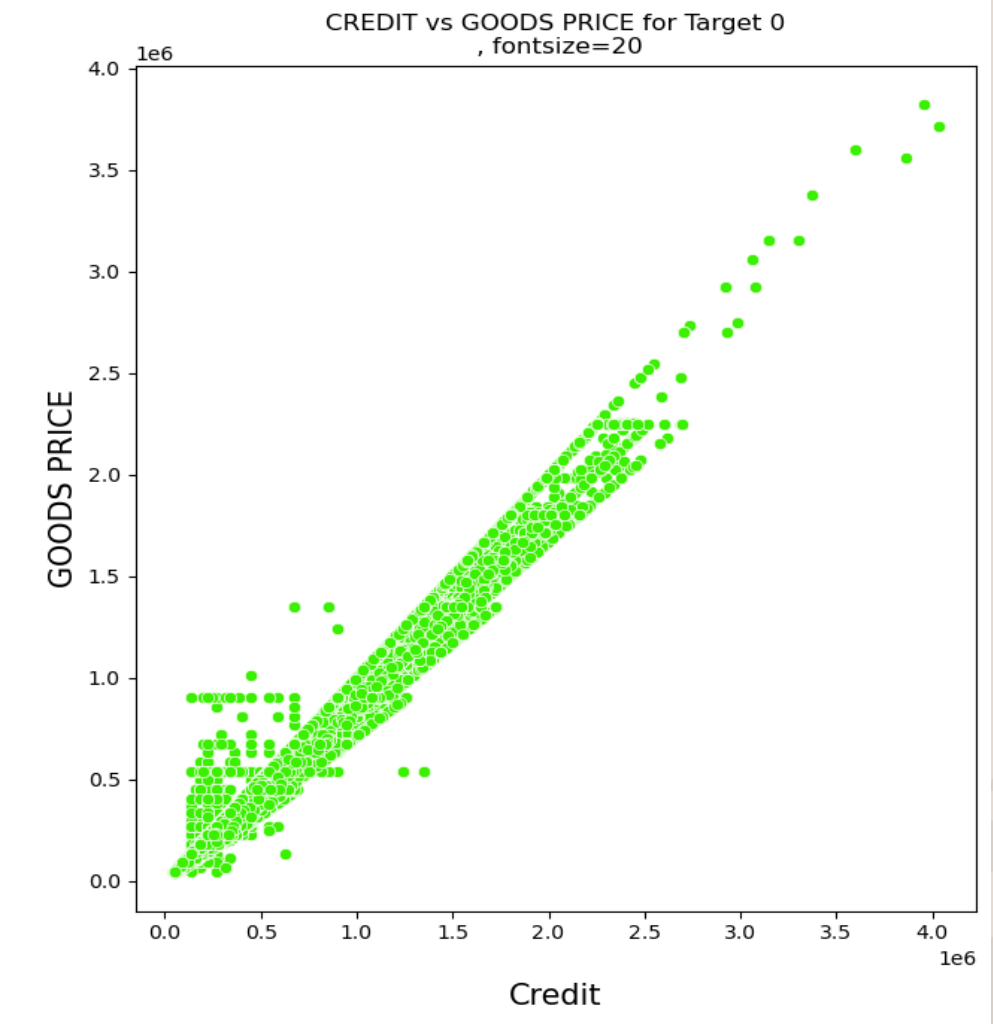
Bivariate :Income v/s Credit for Target0



Income V/S Credit fot Target 1



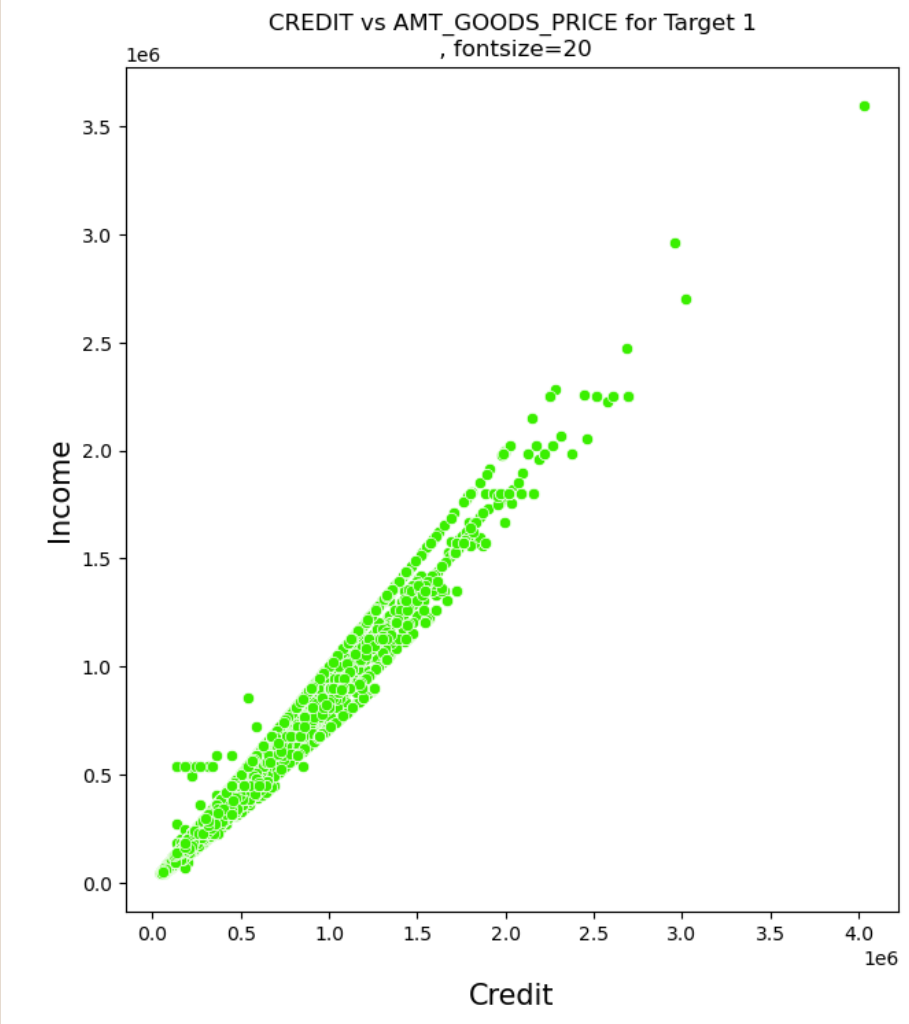
Credit v/s Goods price for Target 0



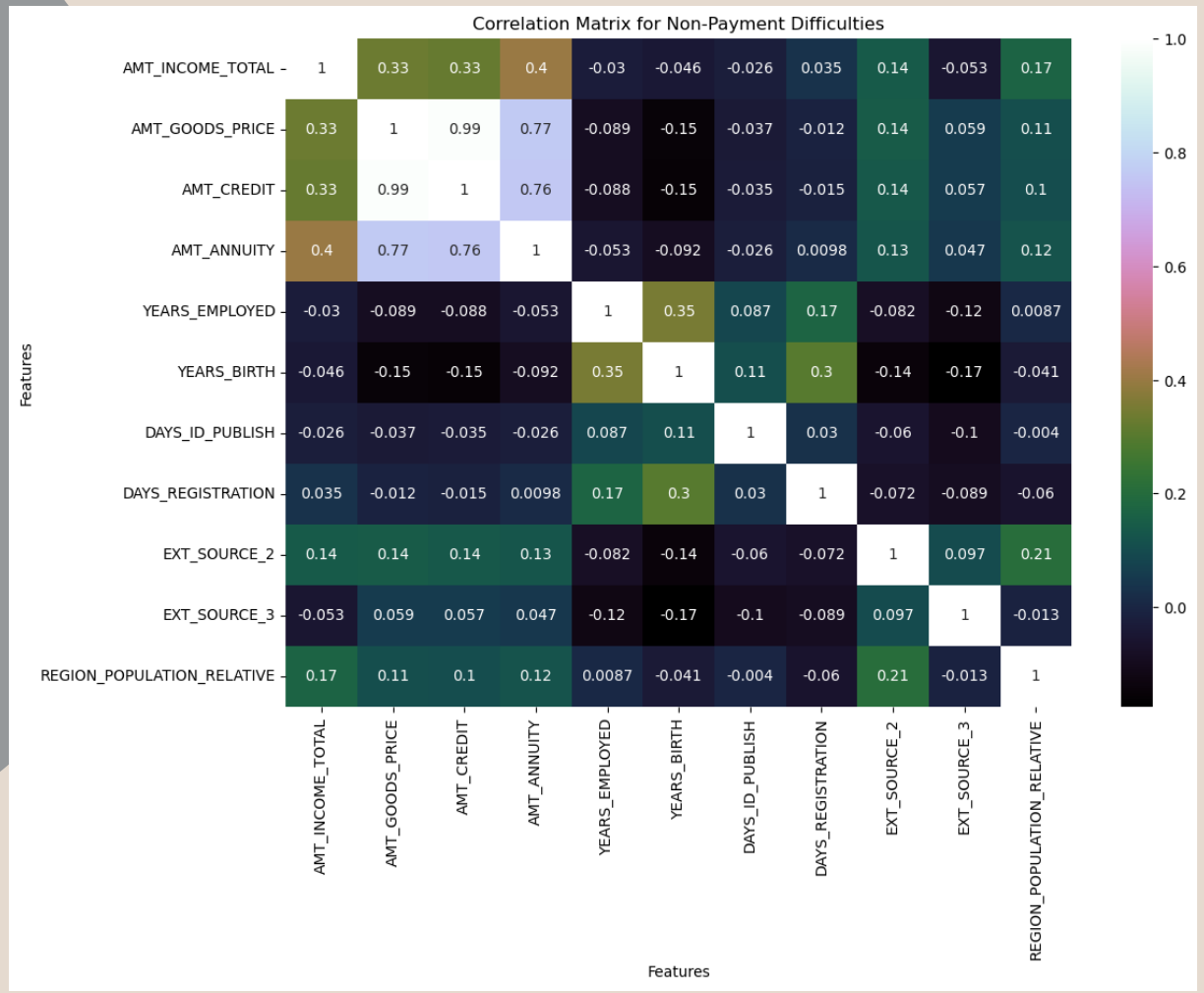
Credit v/s Goods price

With the scatterplot we can determine that AMT CREDIT and AMT GOODS PRICE

are highly correlated i.e they are directly proportional to each other.

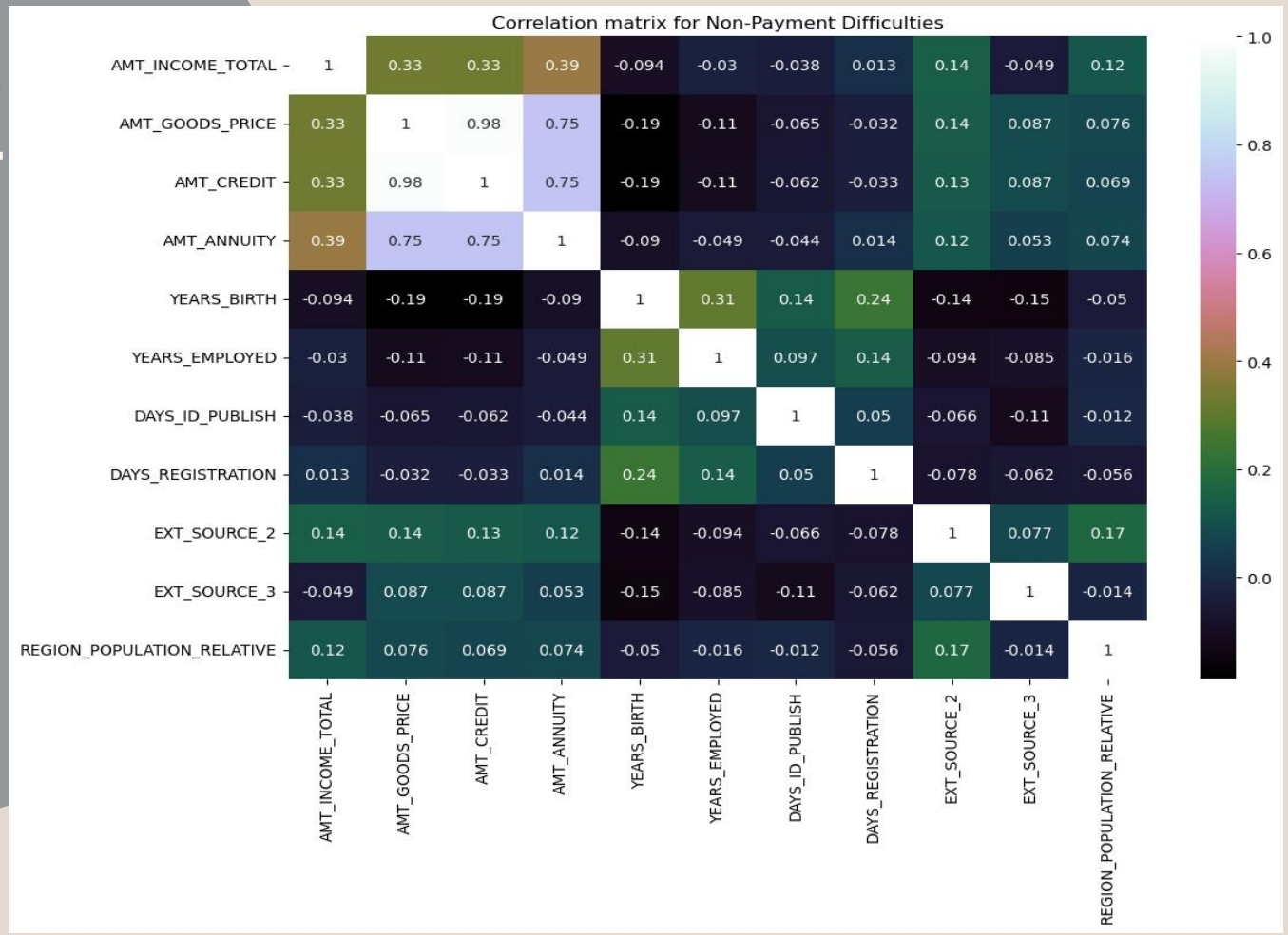


Multivariate : correlation in target 0

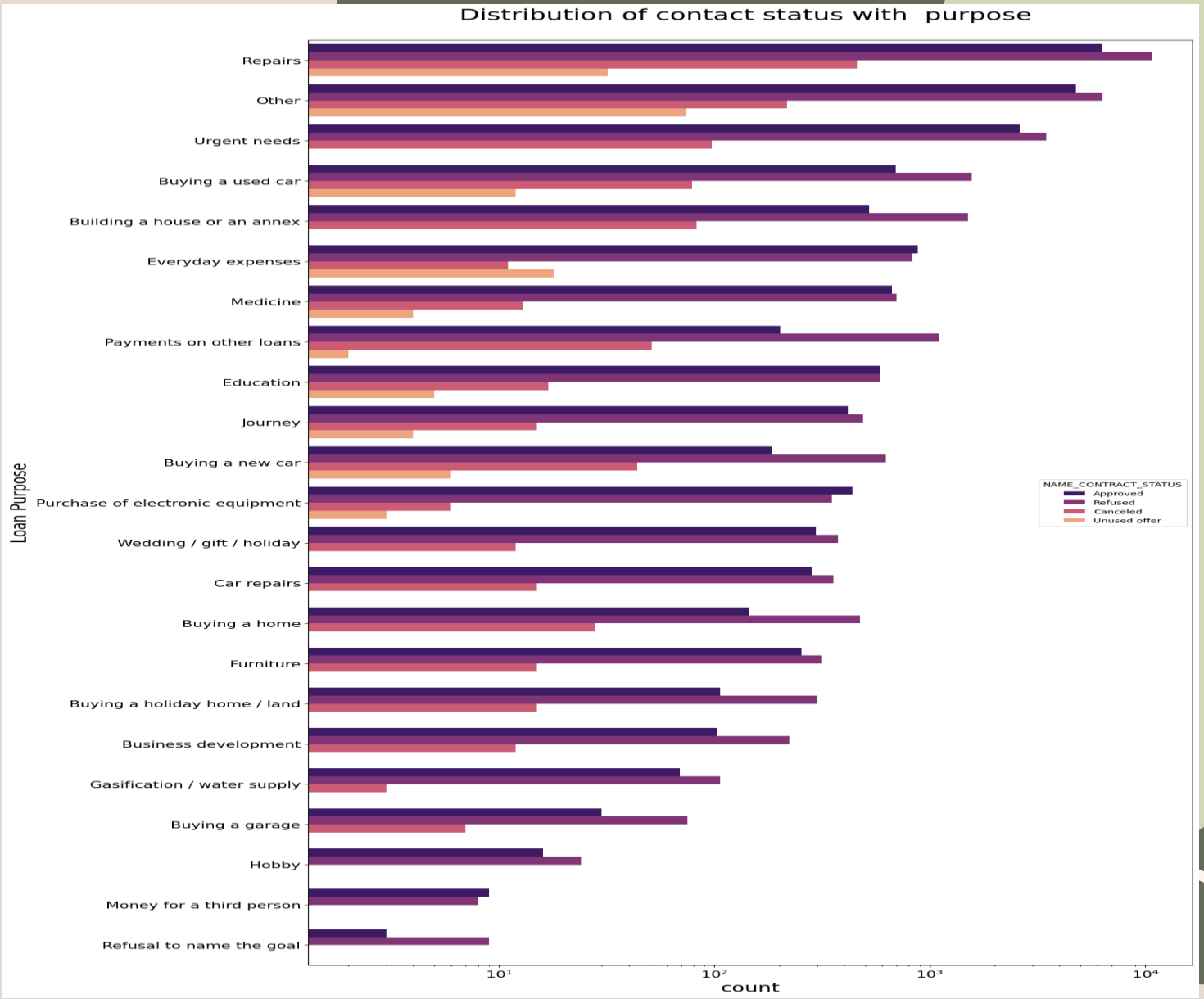


- AMT_GOODS_PRICE & AMT_CREDIT has highest correlation.
- YEARS_BIRTH, YEARS_EMPLOYED & AMT_INCOME_TOTAL has Negative correlation

Multivariate: Correlation in target 1



Univariate analysis on merge data



- Most rejection of loans from repairs
- For education purposes we have equal number of approves and rejection
- Paying other loans and buying a car is having a significant higher rejection than approves.

Distribution of contract status v/s Target

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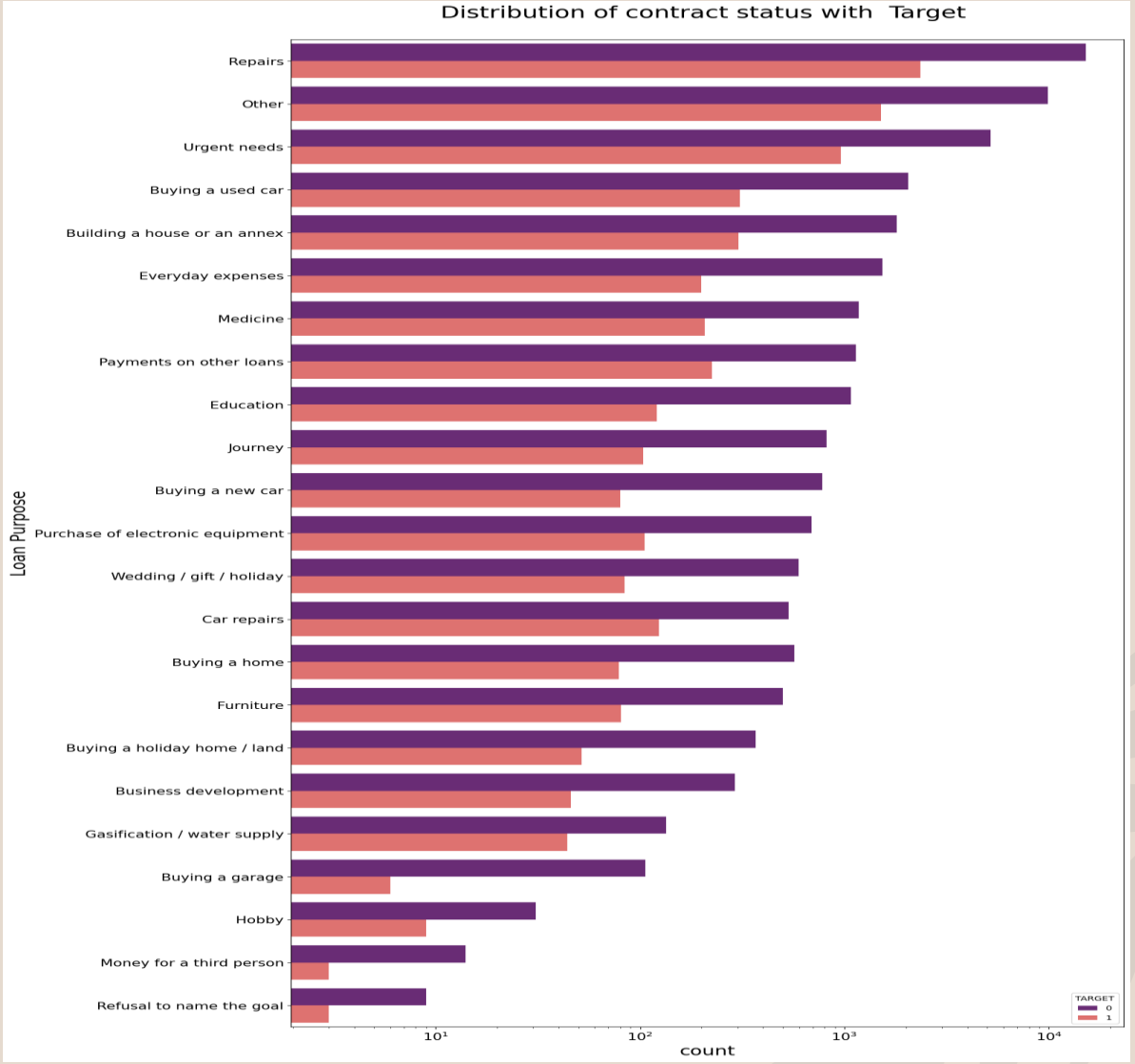

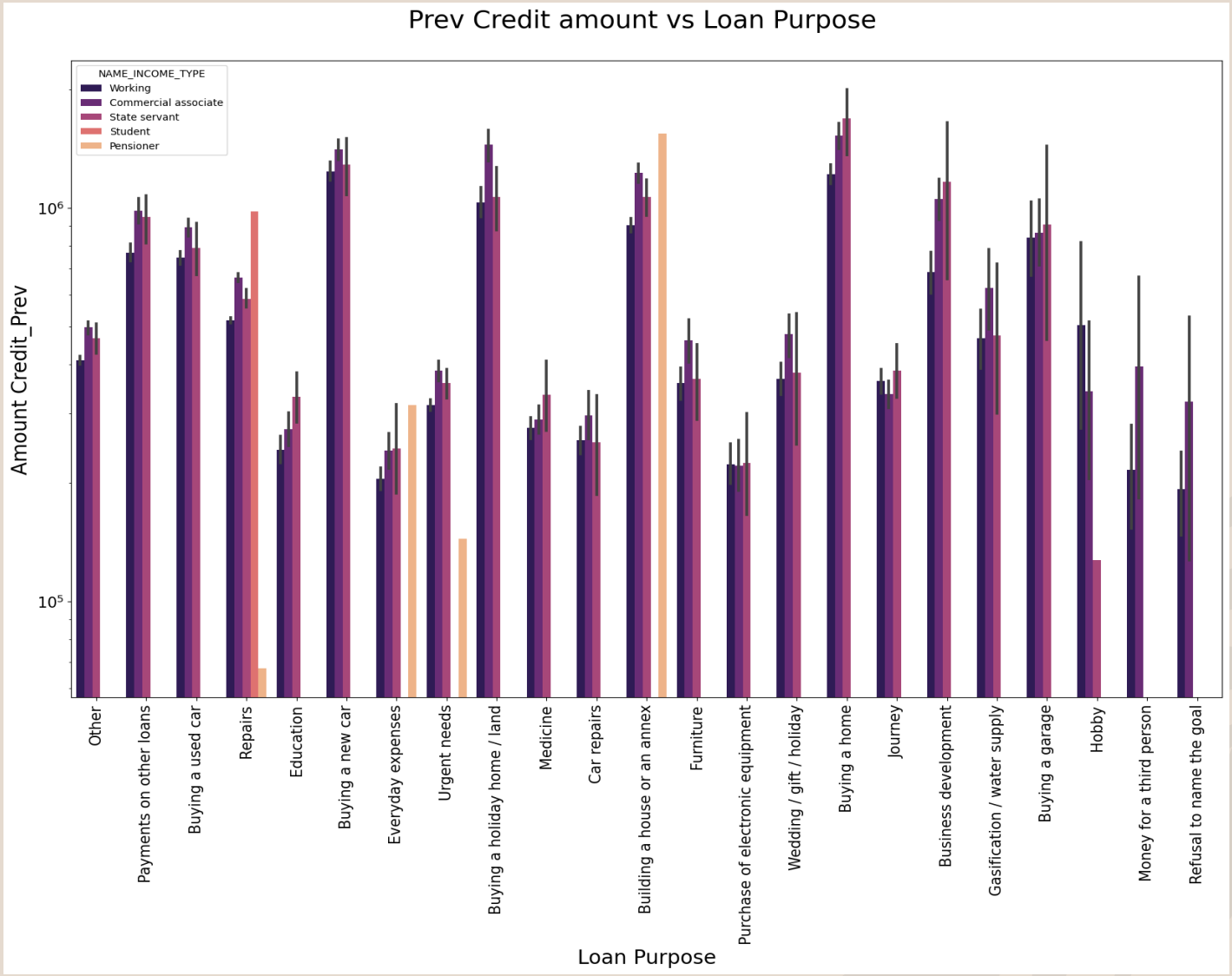
Prev Credit amount vs Loan Purpose
NAME_INCOME_TYPE
Working
Commercial associate
State servant
Student
Pensioner
Amount Credit_Prev
10^6
10^5
Other
Payments on other loans
Buying a used car
Repairs
Education
Buying a new car
Everyday expenses
Urgent needs
Buying a holiday home / land
Medicine
Car repairs
Building a house or an annex
Furniture
Purchase of electronic equipment
Wedding / gift / holiday
Buying a home
Journey
Business development
Gasification / water supply
Buying a garage
Hobby
Money for a third person
Refusal to name the goal
Loan Purpose

Findings

- Certainly! Based on the analysis, here are the main insights:
- Banks mostly approve Consumer Loans.
- Most of the Refused and Cancelled loans are cash loans.
- Most of the approved, refused, and canceled loans belong to old clients, with only 27.4% of loans provided to new customers.
- The percentage of loans approved for females is higher than the percentage refused.
- Most of the approved loans belong to applicants with Secondary/Secondary Special education type.
- The percentage of loans approved for married applicants is higher than for other contract status categories (refused, canceled, etc.).
- Most of the loans that were previously approved belong to the POS name portfolio.
- Credit and cash offices channel type has the highest number of refused and canceled loans.
- Most of the approved loans have a medium grouped interest rate.
- Most of the approved loans belong to Very Low and High Credit range.
- Most of the loans are approved for applicants with a low income range.
- Across all contract statuses (Approved, Refused, Canceled, Unused Offer), people with the Working income type are leading.
- It is important to note that these insights are based on the data available and may not necessarily apply in all situations. It is also recommended to conduct further analysis and modeling to gain deeper insights and inform decision-making.

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