International Institute of Information Technology Bangalore

CREDIT EDA ASSIGNMENT

by: Tushar Warade

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Problem Statement

The loan providing companies find it hard to give loans to the people due to their insufficient or non-existent credit history. Because of that, some consumers use it to their advantage by becoming a defaulter.

When the company receives a loan application, the company has to decide for loan approval based on the applicant's profile.

Two types of risks are associated with the bank's decision:

- If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company
- If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company.

DATA

The data contains the information about the loan application at the time of applying for the loan and previous application .

1. **The client with payment difficulties:** he/she had late payment more than X days on at least one of the first Y instalments of the loan in our sample,
All other cases: All other cases when the payment is paid on time.

2. When a client applies for a loan, there are four types of decisions that could be taken by the client/company):
Approved, Cancelled, Refused, Unused offer.

OVERALL APPROACH

Data Cleaning

- Columns having more than 40% missing values were removed.
- Then columns that seemed irrelevant for analysis were identified and dropped.

Missing Values Treatment

- Category type columns were imputed with most frequent values.
- Numerical columns were imputed with median as the outliers were detected.

Outliers

- Outliers were detected , in some of the columns, outliers could be present due to data entry errors and would require further analysis.
- Suggesting, to treat with the upper or lower limit values in numerical column types

OVERALL APPROACH

Data Standardization

- Ensuring all observations under one variable are expressed in a common and consistent unit.
- Some of the observational columns like flag type with 0 and 1 values were converted to categorical type to be represented as ‘yes’ and ‘no’ for better visualization.
- The columns which are negative where changed to absolute.

Binning

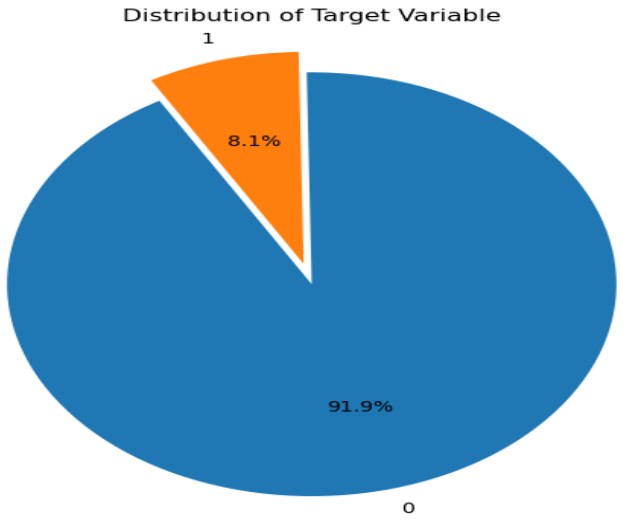
- Created bins/range for certain columns like Age, Income Total, Family status for better visualization and reaching meaningful insights.

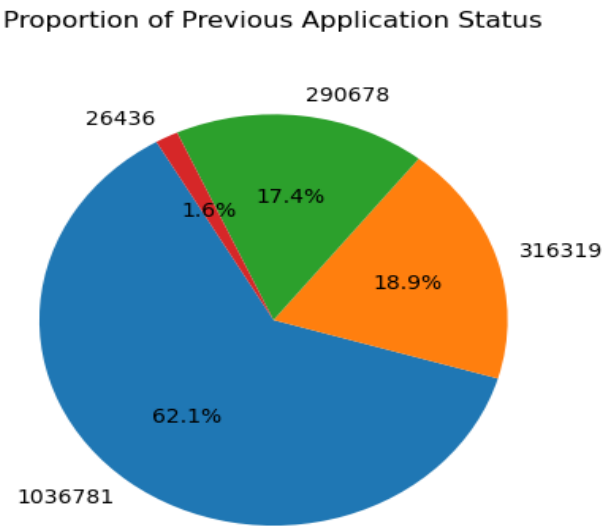
INSIGHTS

- Target data is not balanced, only 8% clients are shown who defaults and 91.9% doesn't default .

- Data imbalance ratio of application data is 11.38%

- Almost 62% applications are approved in previous application data and 18% and 17% are Cancelled and refused respectively.





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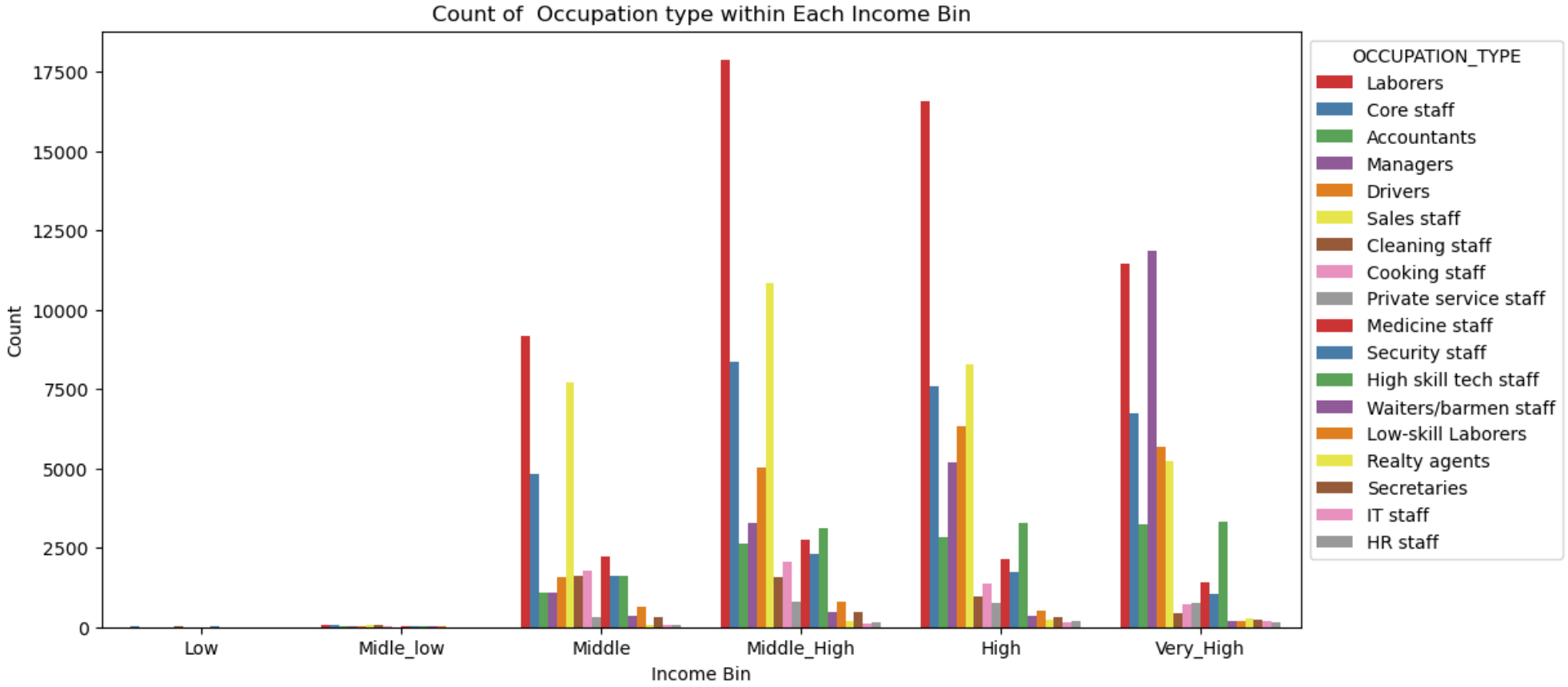
Income w.r.t to Occupation:
Managers have highest income



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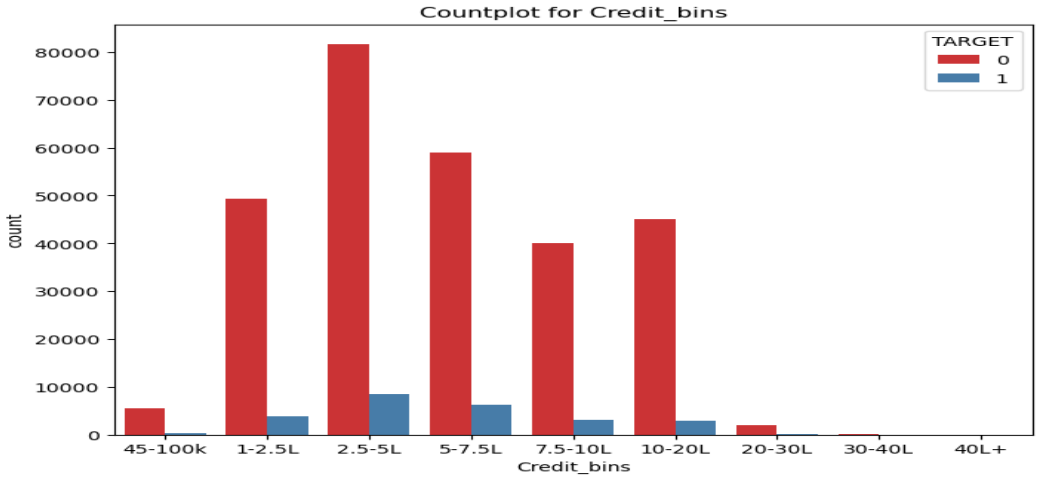
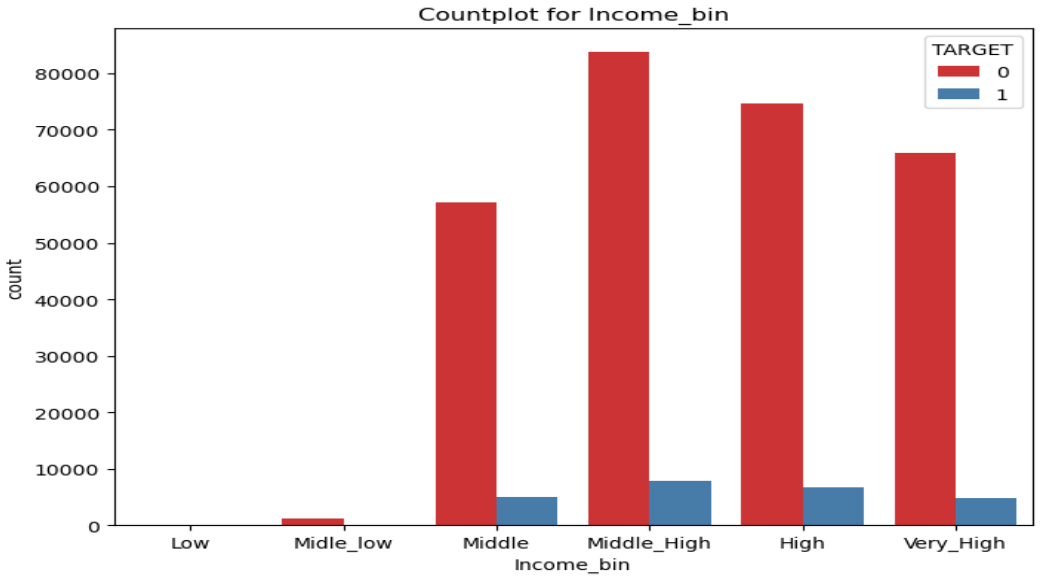
INSIGHTS

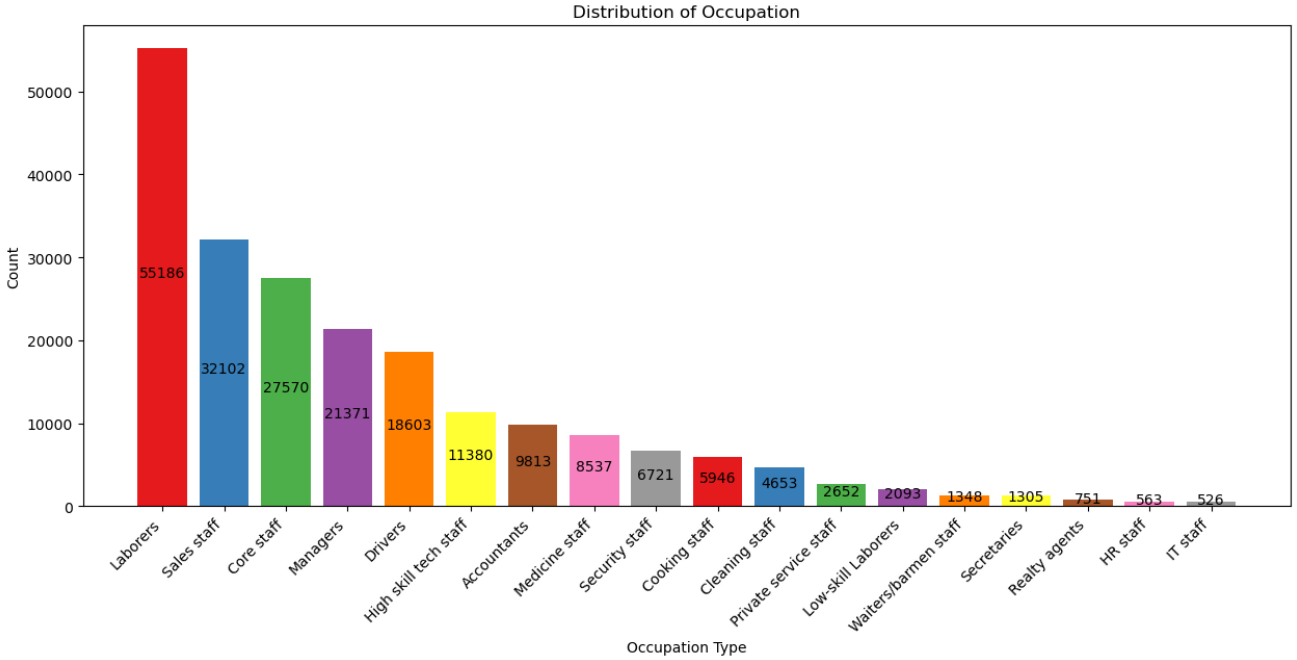
Majority of Target 0 i.e repayors takes credit between 2.5L to 5L and are likely to repay the loan



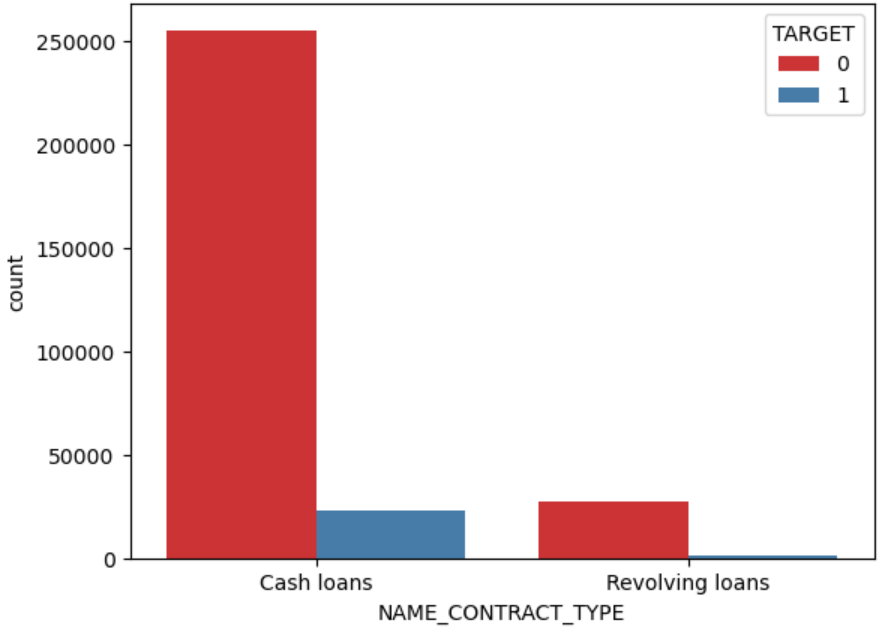


- **Majority of people are in 76k to 80k income range**

- Labourers are the highest applicants for loans



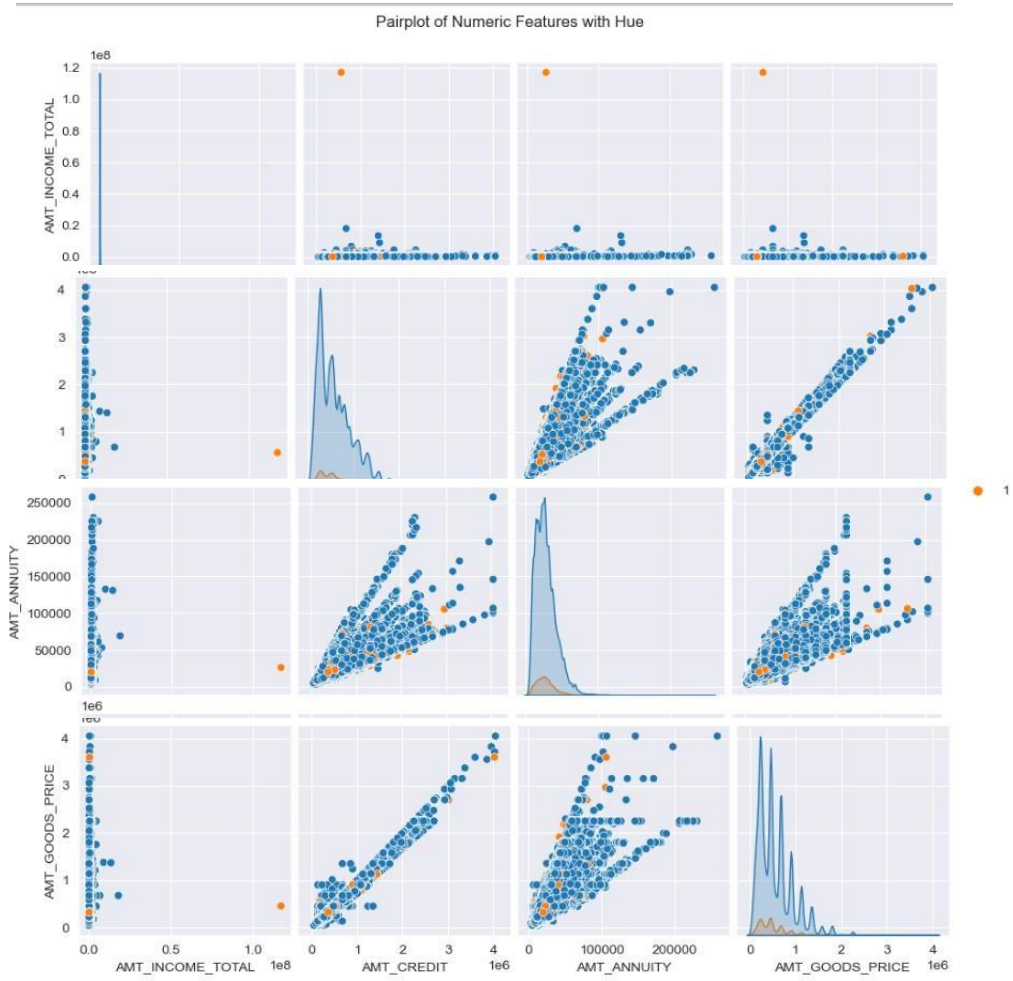
- Clearly the applicants prefer Cash Loans over Revolving Loans



INSIGHTS

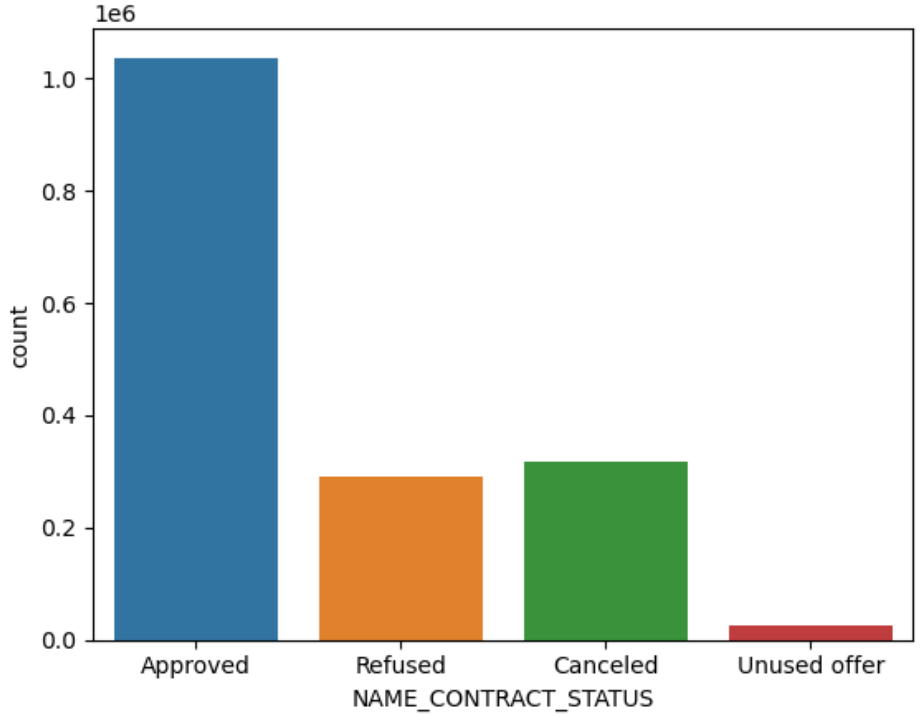
- When amount annuity is greater than 15k and amount goods price is greater than 20 lakhs there appear to be a lower chance of defaulters
- This suggests that clients with higher annuity and goods price values may be more reliable in terms of loan repayment.

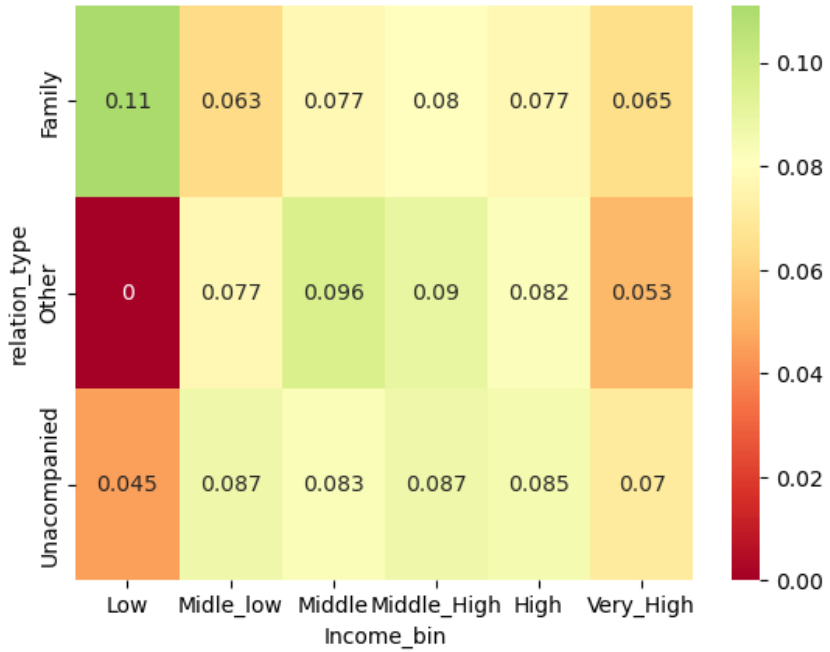
- Correlation between loan amount and goods price loan amount are highly correlated. We can see in the scatterplot that most of the data points form a line
- There are less defaulters whose loan amount exceeds 2 millions. So whose loan amount is high is less likely default



INSIGHTS

- There are huge number of Approved loan than Refused.





- Alone people are most likely to default And applicants with family are most likely to repay.

SUMMARY

Factors indicating possibility of loan default:-

- **Gender Dynamics:** Male applicants are more prone to default
- **Marital Status Matters:** Individuals in civil marriages/single status has higher default rate.
- **Education level :** Less educated people are more likely to default their loan.
- **Loan history:** Applicant whose previous loans are refused/cancelled are more likely to default their loan.
- **Occupational Hazard:** Unemployed, unskilled staff like labors, and people with less stable jobs are more likely to default.
- **Youthful Tendencies:** Younger applicants aged between 20–40 face a comparatively higher probability of default.
- **Income Anomalies:** Clients on maternity leave or experiencing unemployment tend to have a higher likelihood of default.
- **Family Size Influence:** Clients with larger families or more children tend to have higher default rates.
- **Work Experience Variable:** Clients with less than five years of employment history exhibit an elevated default rate.

RECOMMENDATIONS

- Inspecting the reasons of loan cancellation and record loan cancellation reasons could give a chance to renegotiate terms with client.

- Previously rejected clients have successful repayments. Briefly analyzing and reconsider the rejected applicants could mitigate business losses and expand lending opportunities.