Lending Club Case Study

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Problem Statement

We work for a consumer finance company which specializes in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision 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

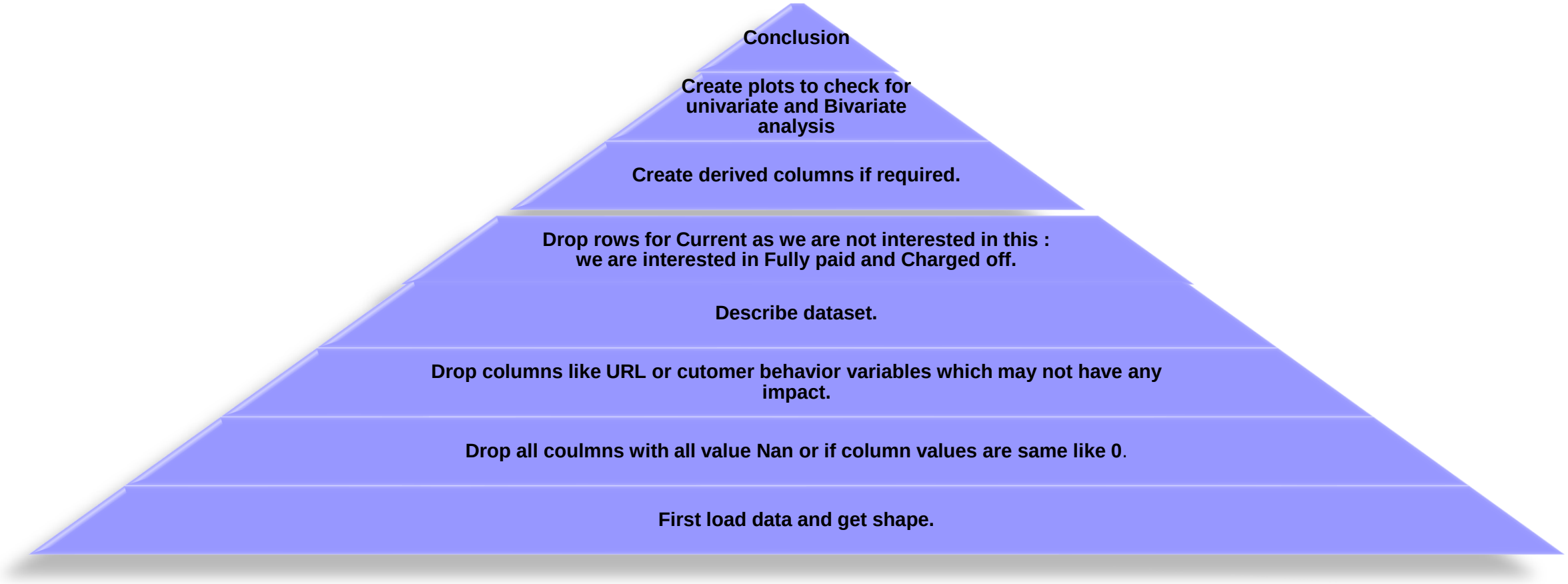
If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company

The aim of this case study is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

Analysis Approach

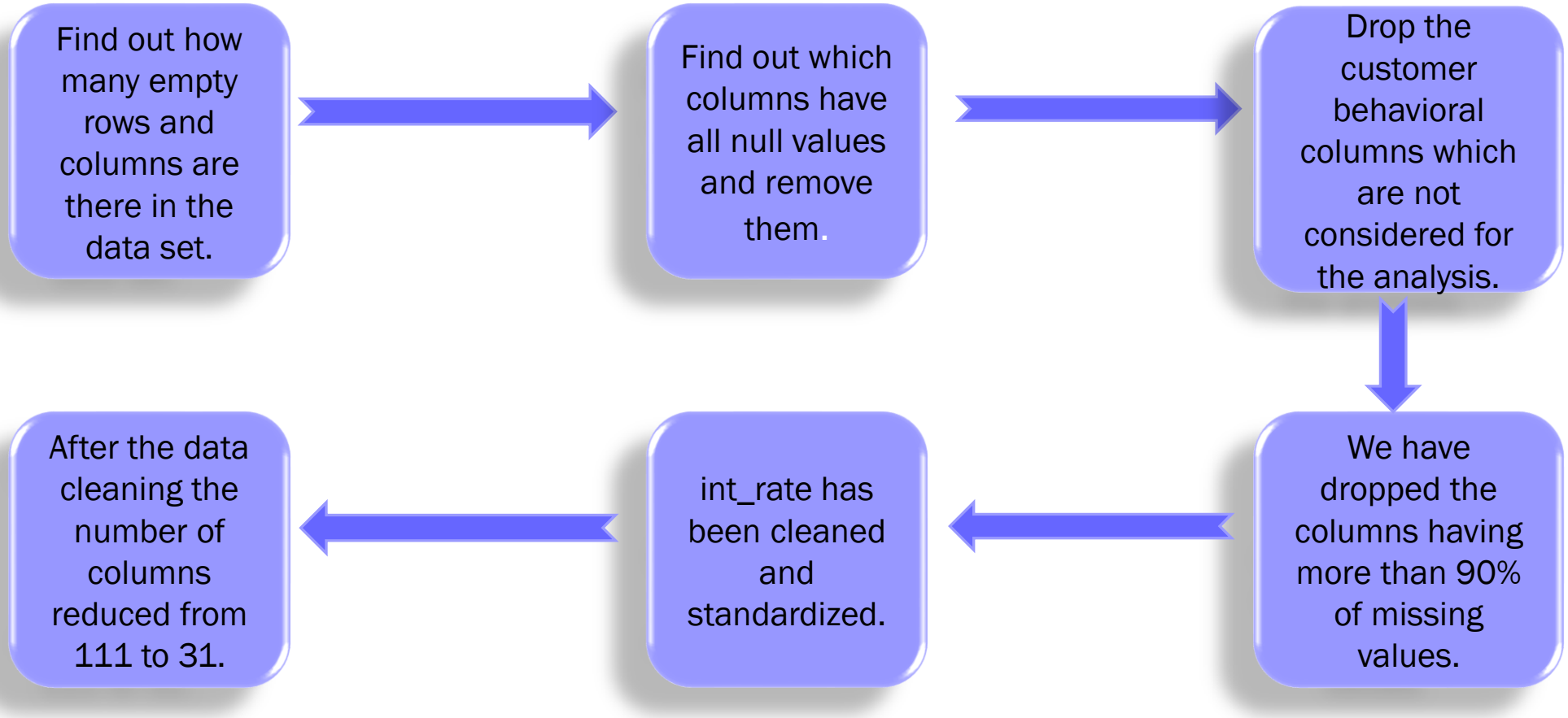
In this case study, we have used EDA to understand how **consumer attributes** and **loan attributes** influence the tendency of default.

Following steps are followed in the analysis:



Data Cleaning

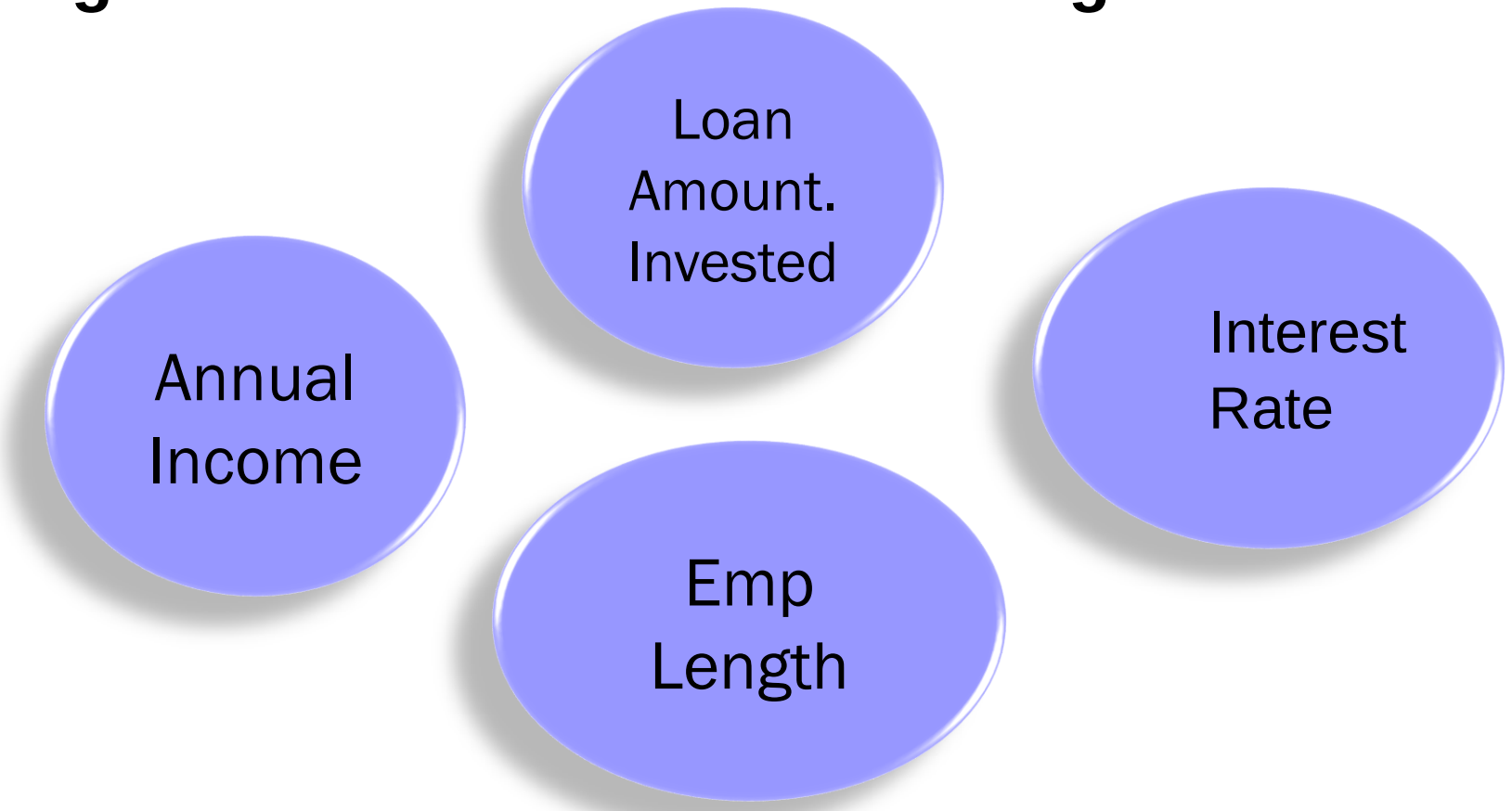
Steps followed in the data cleaning



Derived Metrics

- has_defaulted column has been derived from loan_status.
- Created income_category from annual_inc column.

Categorical division of the following columns is done



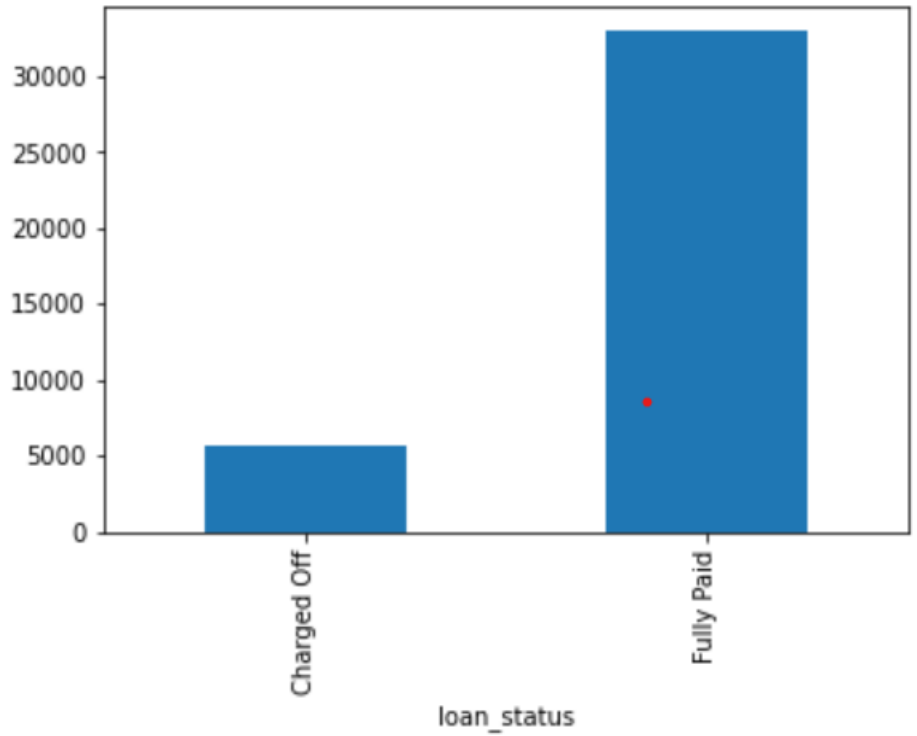
Univariate Analysis

- Loan Status
- Loan Amount Invested
- Annual Income
- Term of loan
- Emp Length

Observations LOAN Amount

- Loan amount is in the range 5000 to 15000.
- Around 14.16% loans were charged off out of total loan issued

Fully Paid	83 %
Charged off	14 %
Current	3 %



Bivariate Analysis

- has_defaulted column has been used for bivariate analysis for following variables:

Loan Term

Interest rate

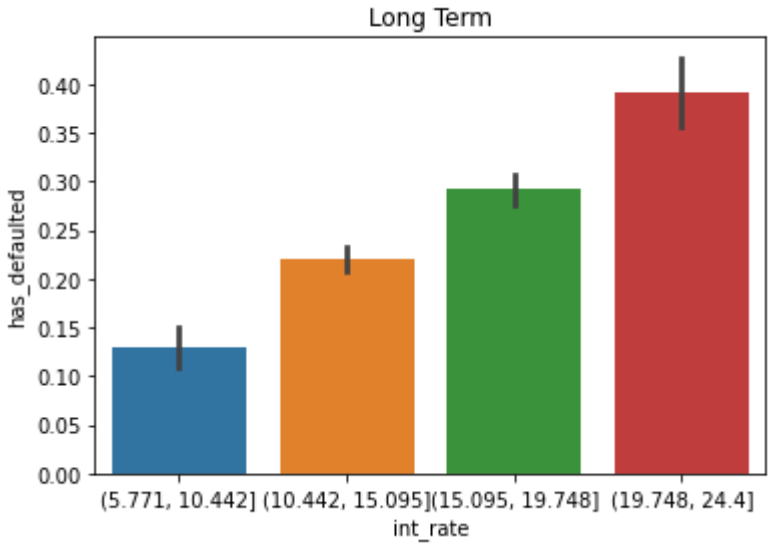
Annual Income

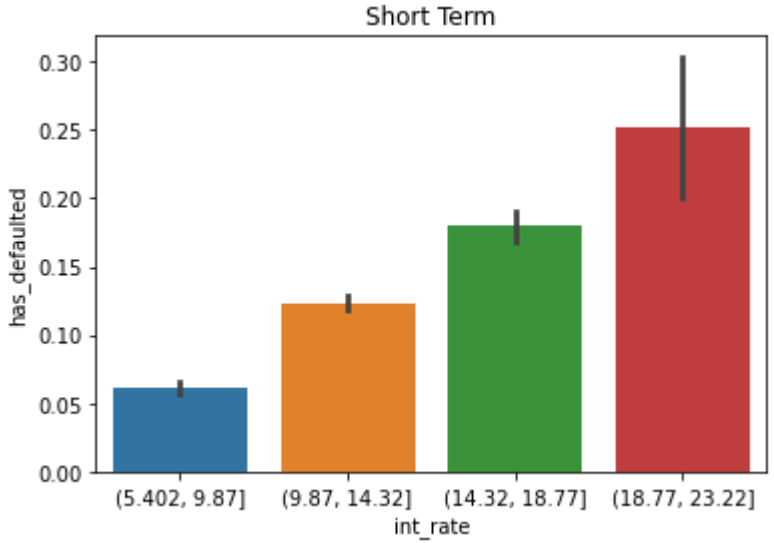
Grade

Purpose

Previous bankruptcies

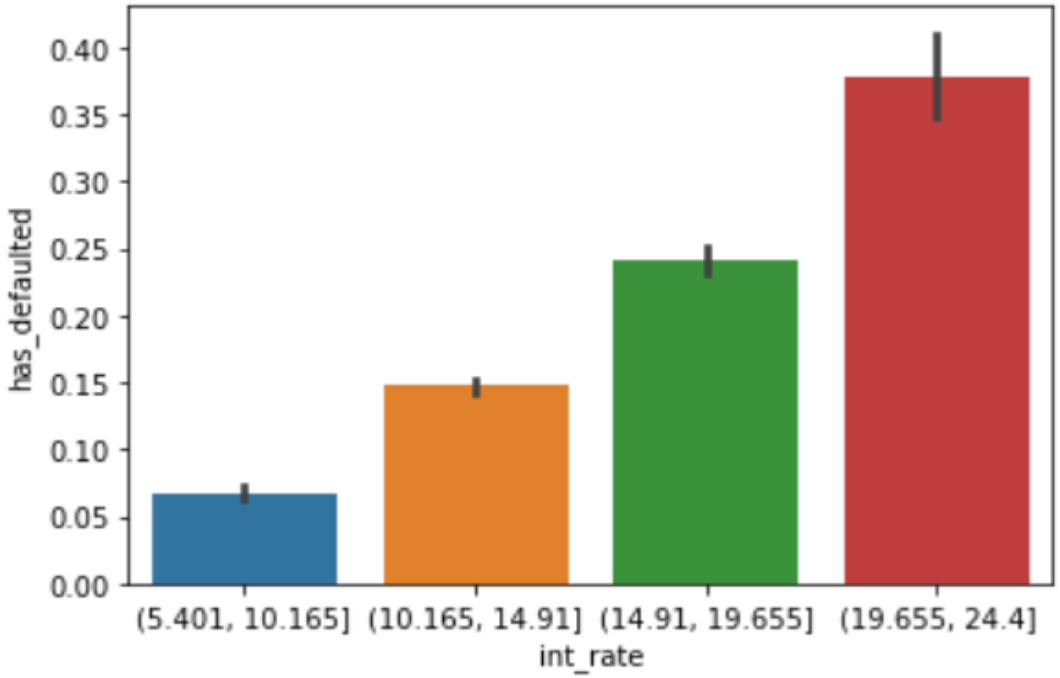
Loan Term observation





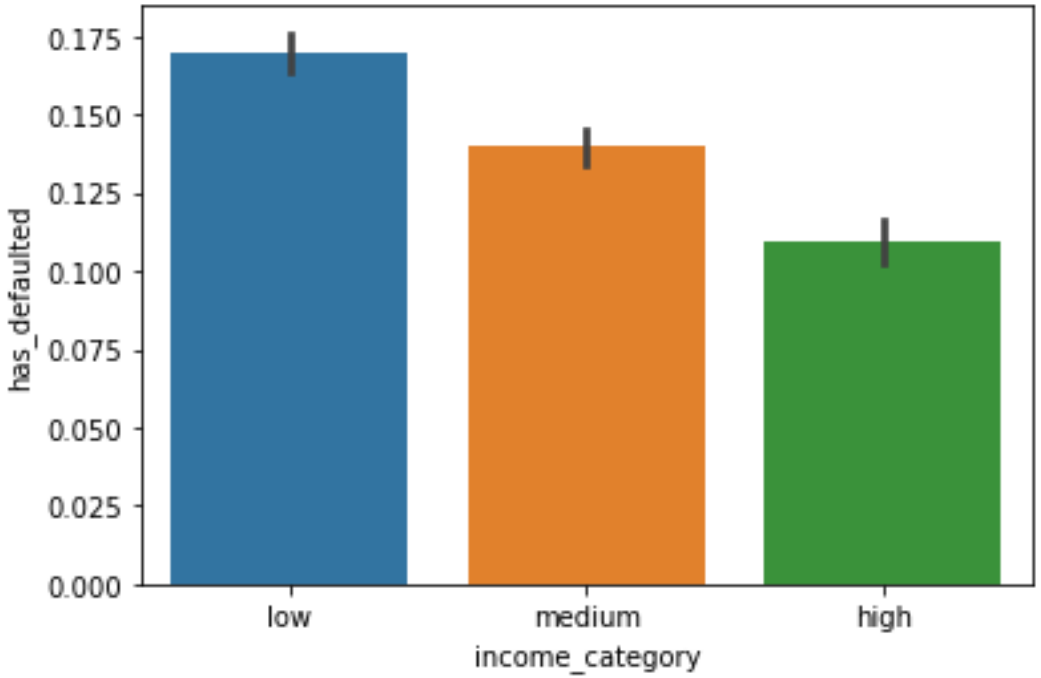
Long term loans has high defaults.

Interest rate observation



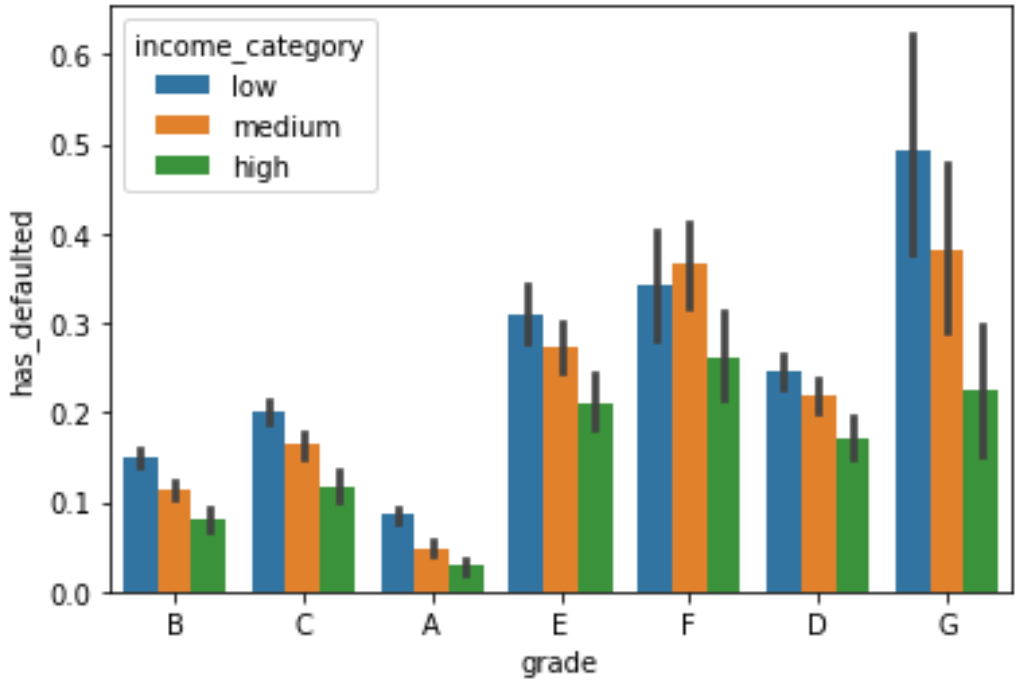
Higher interest rate is a driving factor for high defaults

Annual Income observation



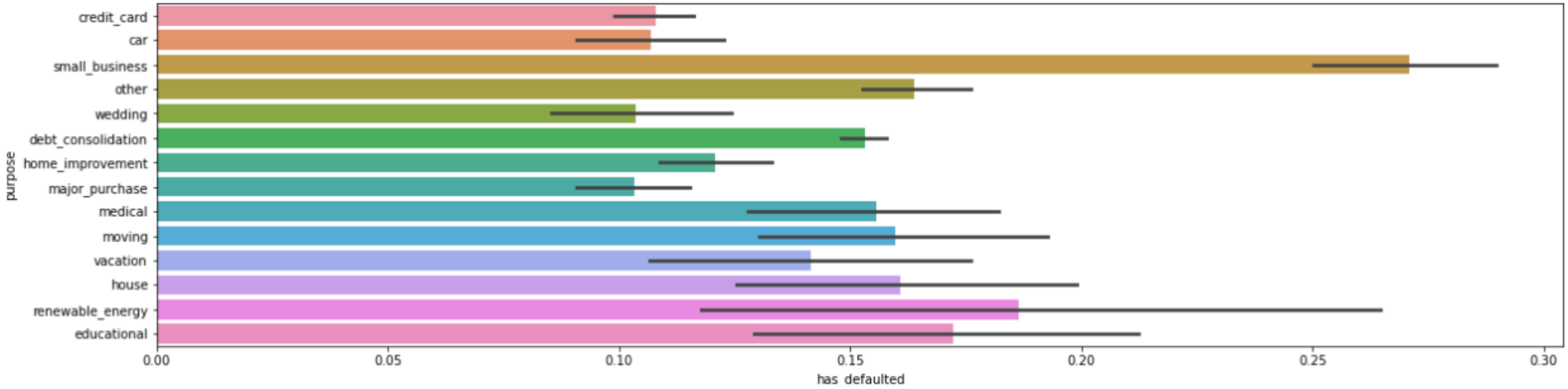
The defaulters are present more in low income group.

Grade observation



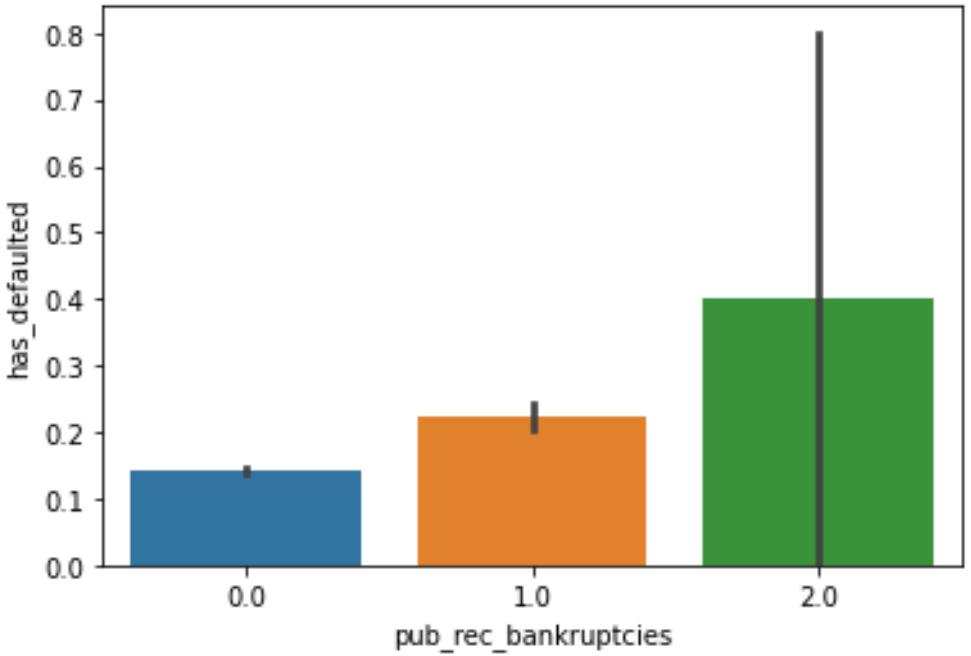
In loans with different grades, loan with G grade have defaulted the most.

Purpose observation



Borrowers with purpose 'small_business' have highest rate for defaults.

Previous bankruptcies observation



Borrowers, who went bankrupt earlier, will most probably default.

Consolidated observations

- **Annual income**:
  - loan amount increases when borrower has high income level.
  - low income group borrower are less likely to pay the loan.
- **Interest rate**: Higher interest rate has led to high defaults.
- **Term of loan**: Long term loans has high defaults.
- **Grade Analysis**: Providing loan to a borrower with credit grade G could be risky as loan with G grade have defaulted the most.
- **Purpose of loan** : Borrowers with purpose 'small_business' have highest rate for defaults
- **Earlier Bankrupt Borrowers** : Borrowers, who went bankrupt earlier, will most probably default.

Recommendation

- Reduce giving high interest rate loans with low income group.
- Stop high risk loan like earlier bankrupt borrowers for small business purposes.
- Long term loans should be minimized and focus can be on short term loans .
- Focus on increasing safe loans like
  - Borrowers having record of bankruptcy
  - Loan with low interest rate
  - Short term loans

Thank you

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