

LENDING CLUB CASE STUDY

Name: Chandan Kumar (Group Facilitator)

Prachi Sharma

Background of Lending Club Company

Lending club is the marketplace for personal loans that matches borrowers who are seeking a loan with investors looking to lend money and make a return.

- Borrowers interested in loans apply by filling an application on online platform at LendingClub.com
- LC evaluates and assigns credit score to each borrower using past historical data .
- Based on the credit score investors decide if they want to lend money to them and the other loan parameters like interest rate, term of loan, monthly instalment etc.
- While selecting the loans, investors also consider their own risk tolerance, investment portfolio goals and time horizon.

Business Objective

To understand the driving factors (or driver variables) behind loan default, i.e. the variables which are strong indicators of default. This will help the company/investors in making the decision to either accept /reject the loan.

There are 3 types of variables in data

- Borrower's demographic variables
- Loan characteristics
- Customer's behaviour variables

Type	Example
Borrower's demographic variables	emp_title, emp_length, description, zip_code,
Loan characteristics	Loan_amount, funded_amount, funded_amount_inv, interest_rate, grade
Customer's behaviour variables	Revol_bal, revol_util, delinq_2yrs, mths_since_last_delinq



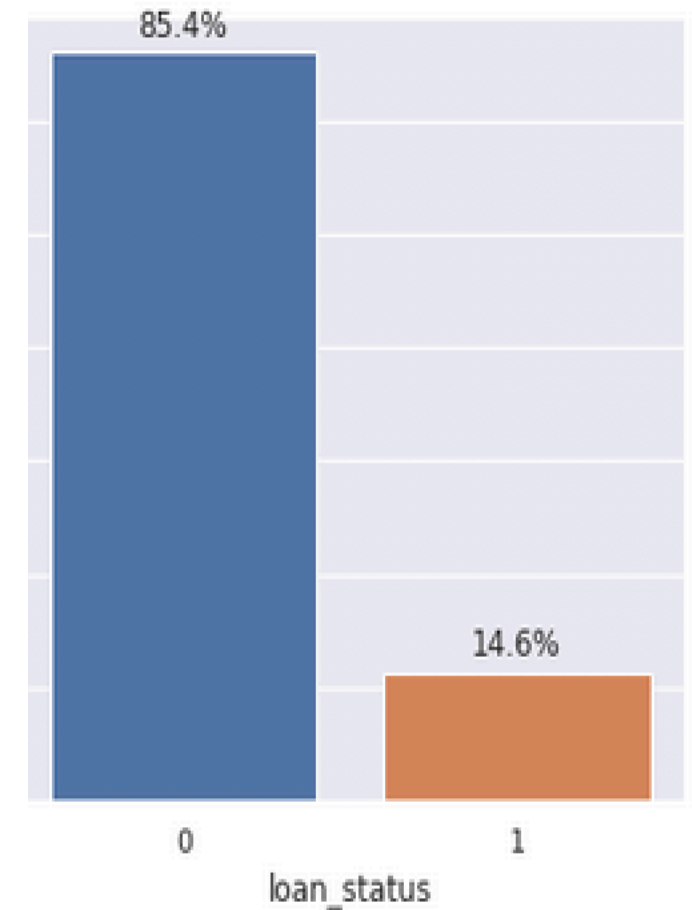
Understanding Target variable - Loan Default rate

Target Variable : loan_status

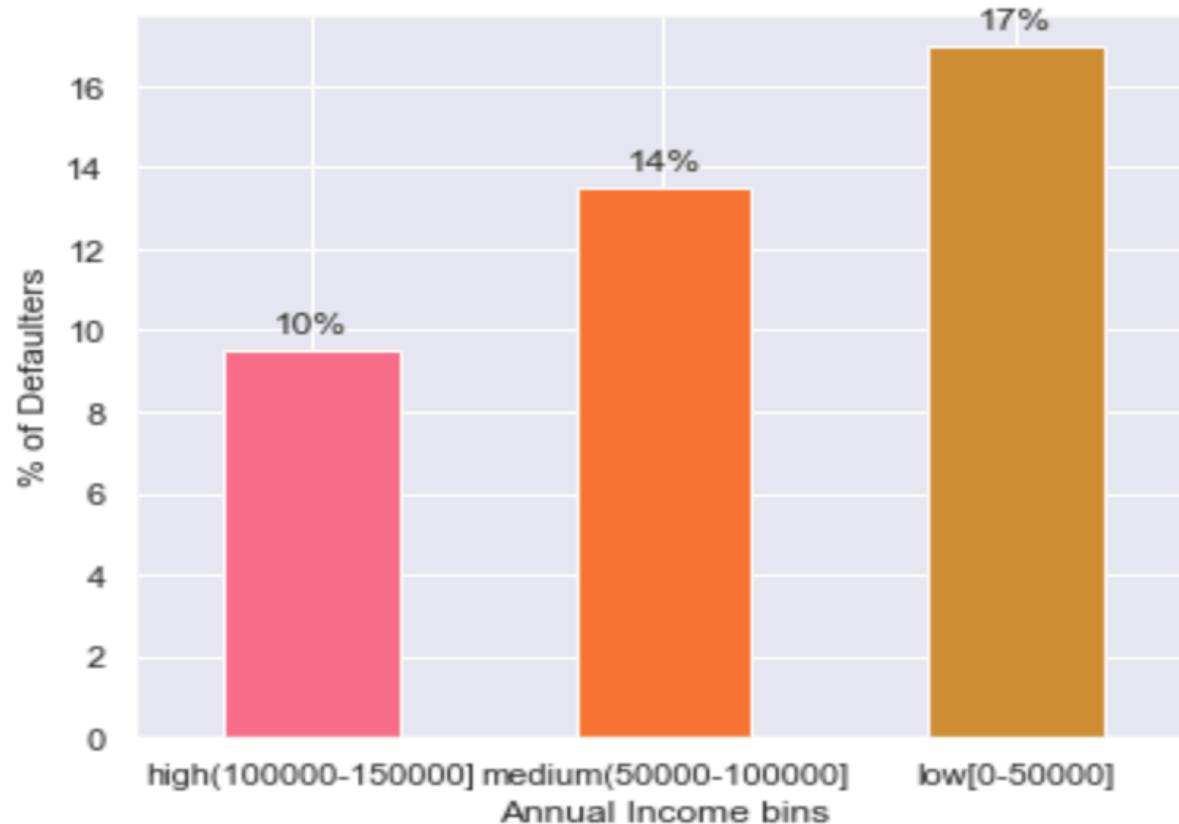
- Overall Default Rate is 14.6% as per provided dataset

Assumptions:

- All the Active loans are not considered in Analysis
- Fully Paid Loans are represented as Code Zero(0) : **Non-Defaulters**
- Charged-Off Loans are represented as Code One (1) : **Defaulters**

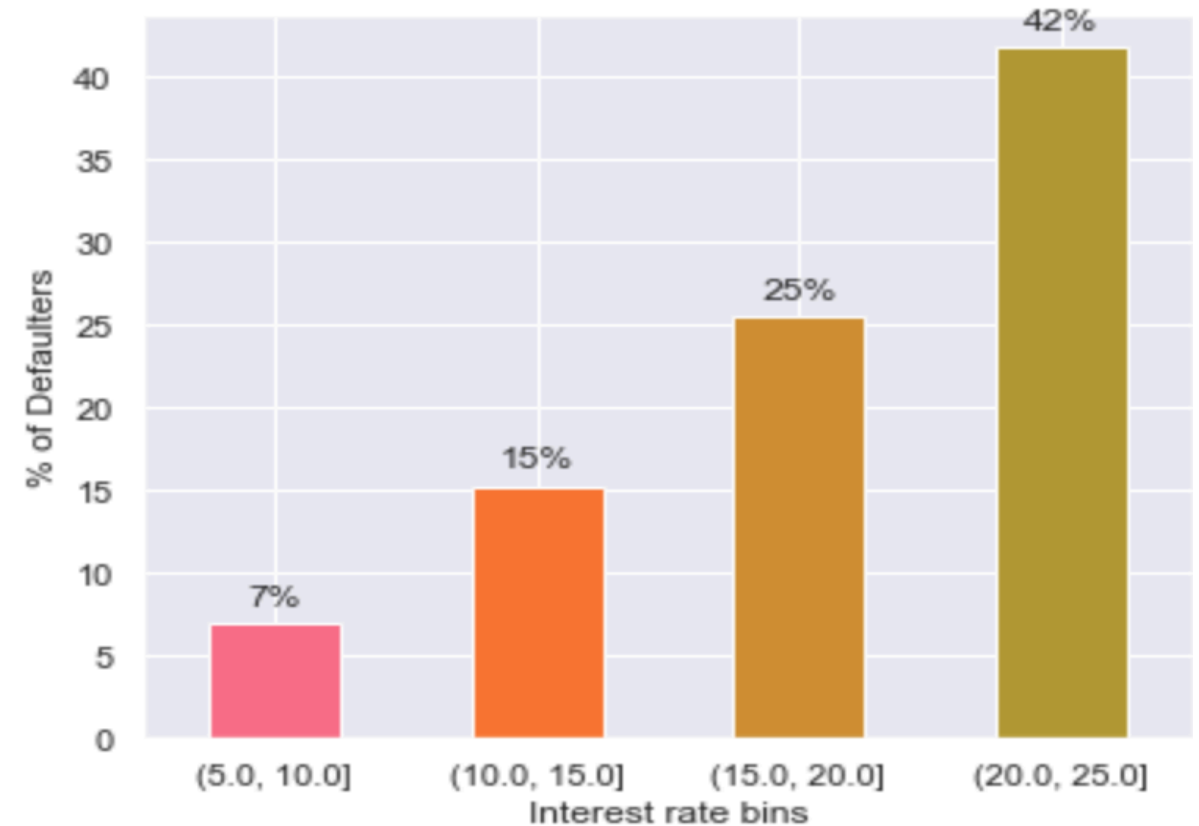


% of loan defaulters on basis of binned annual inc



- Low annual income leads to high default rate

% of loan defaulters on basis of binned interest rate



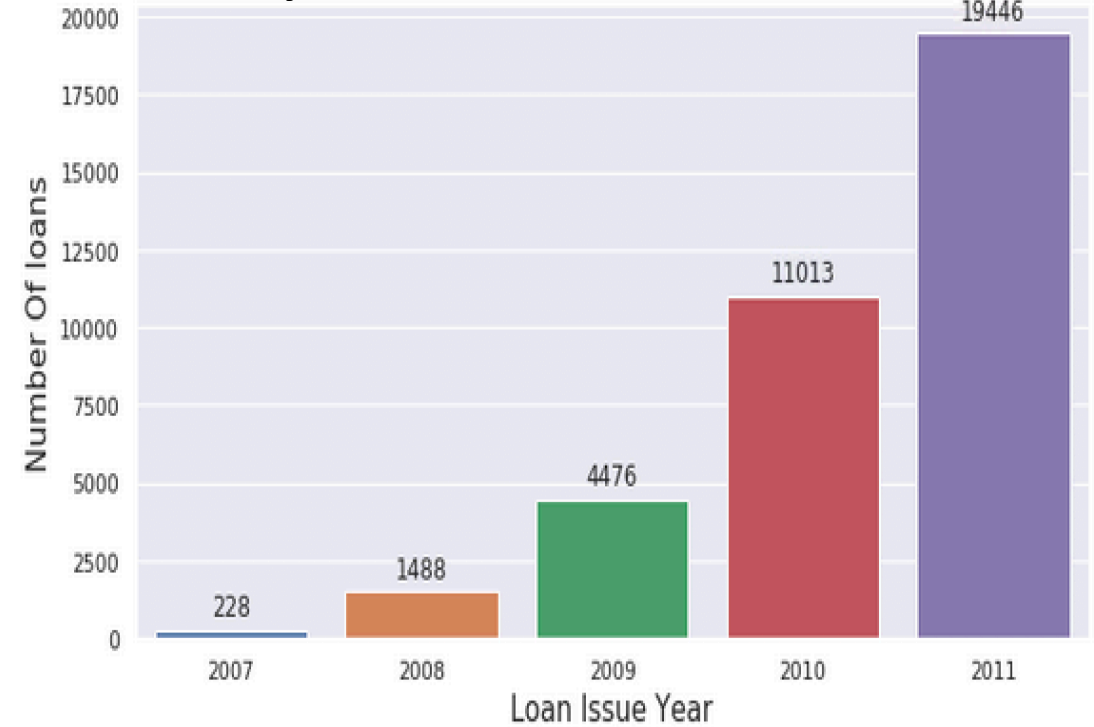
- Default rate increases with interest rate
- More the interest rates , higher are the default rates
- Highest for 20-25% interest rate bin

% of loan defaulters on basis of loan issued year



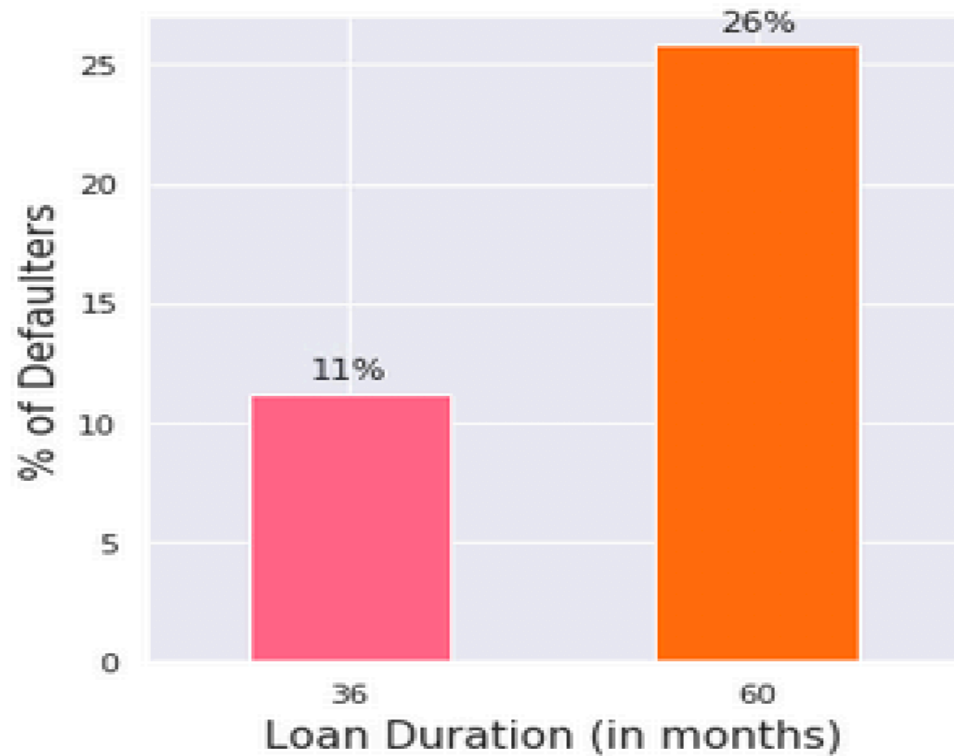
- Default rate decreasing from 2008 to 2010, sudden increase in 2011.
- Highest in 2007 followed by 2011.

Frequency distribution of loans on basis of loan issued year



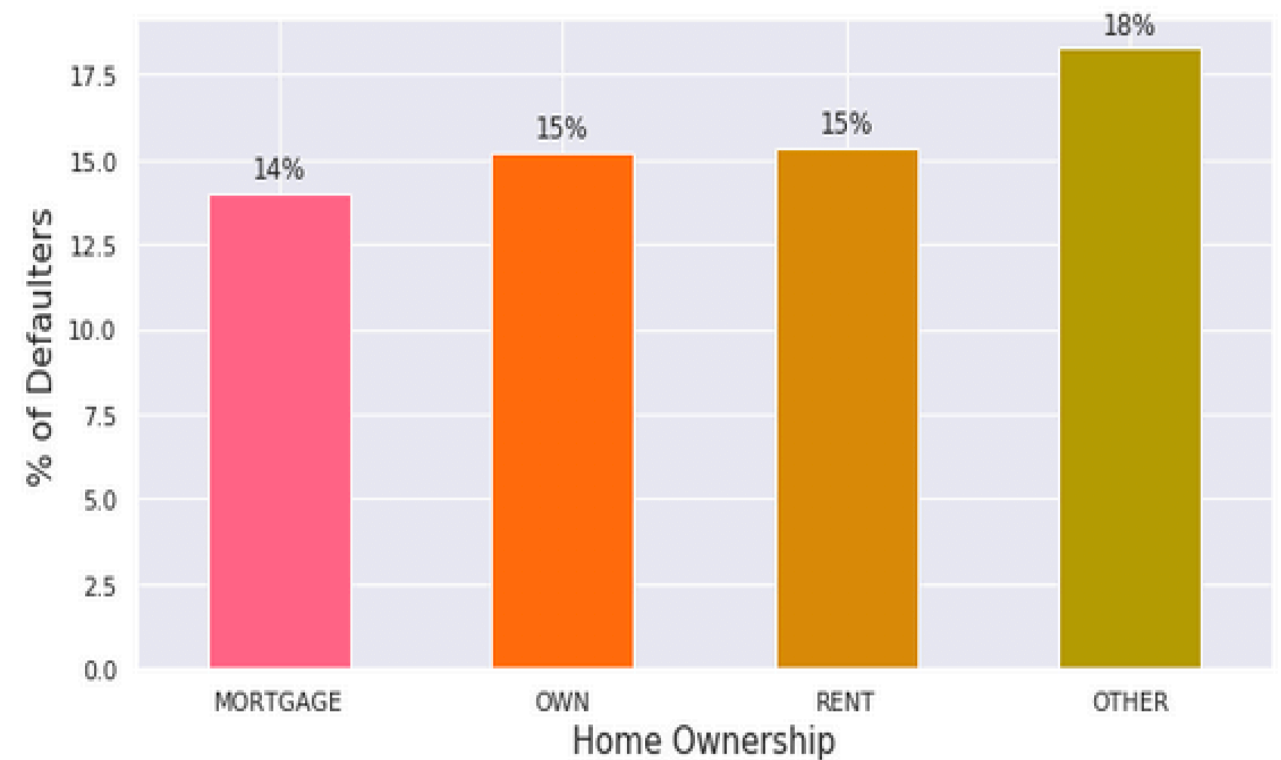
- As per the trend, loan applications are increasing from 2007 to 2011
- Maximum loans were issued in 2011.

% of loan defaulters on basis of loan term



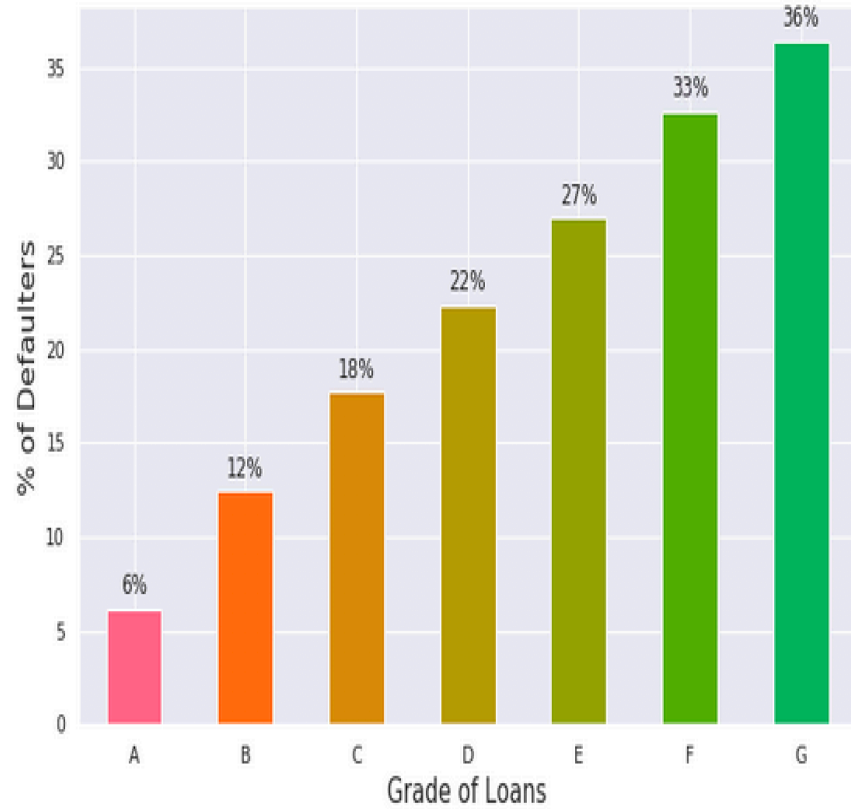
- Loans with 60 months loan term have highest default rate

% of loan defaulters on basis of home ownership

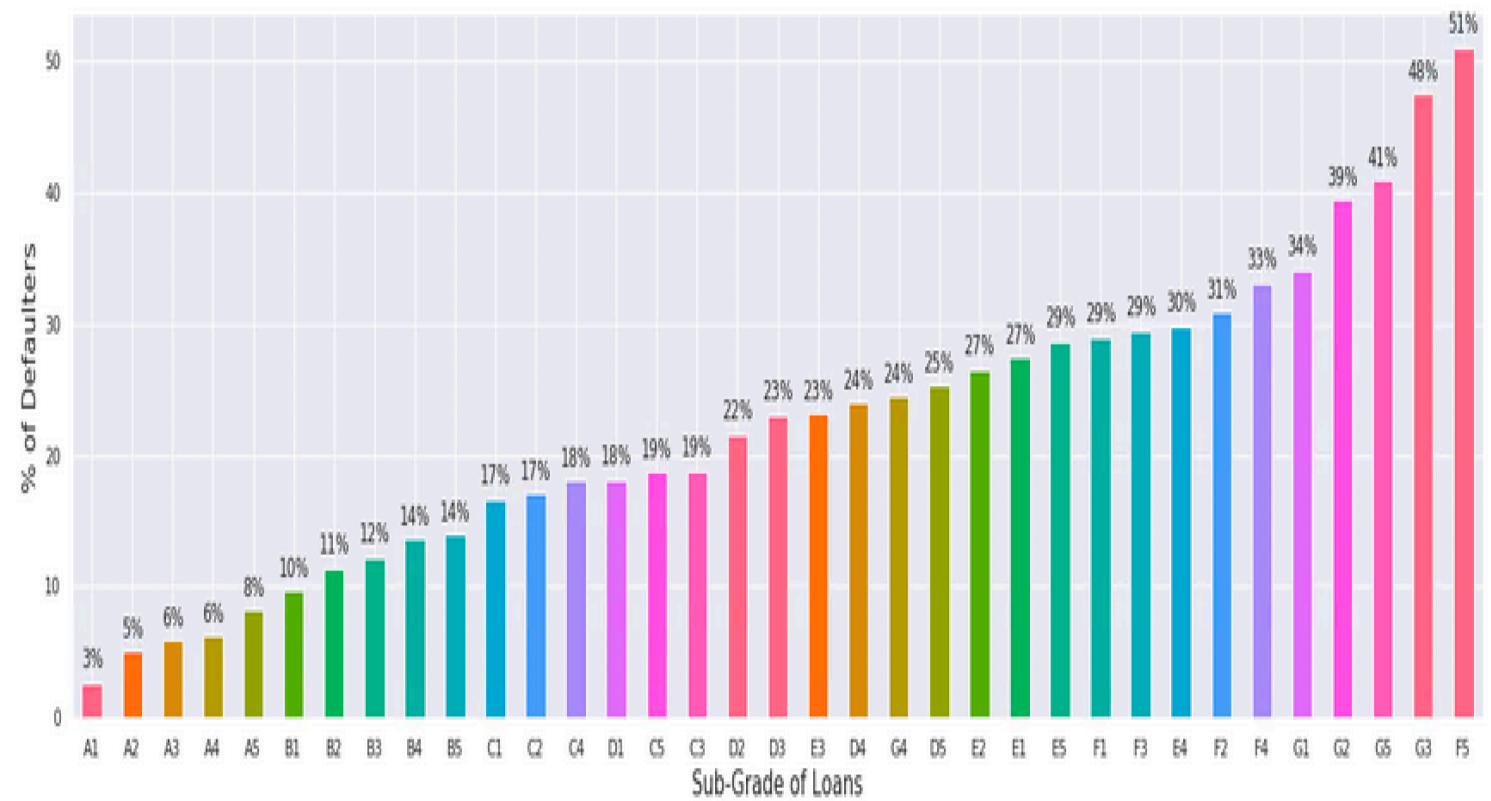


- Default rate increases from MORTGAGE to RENT

% of loan defaulters on basis of grade



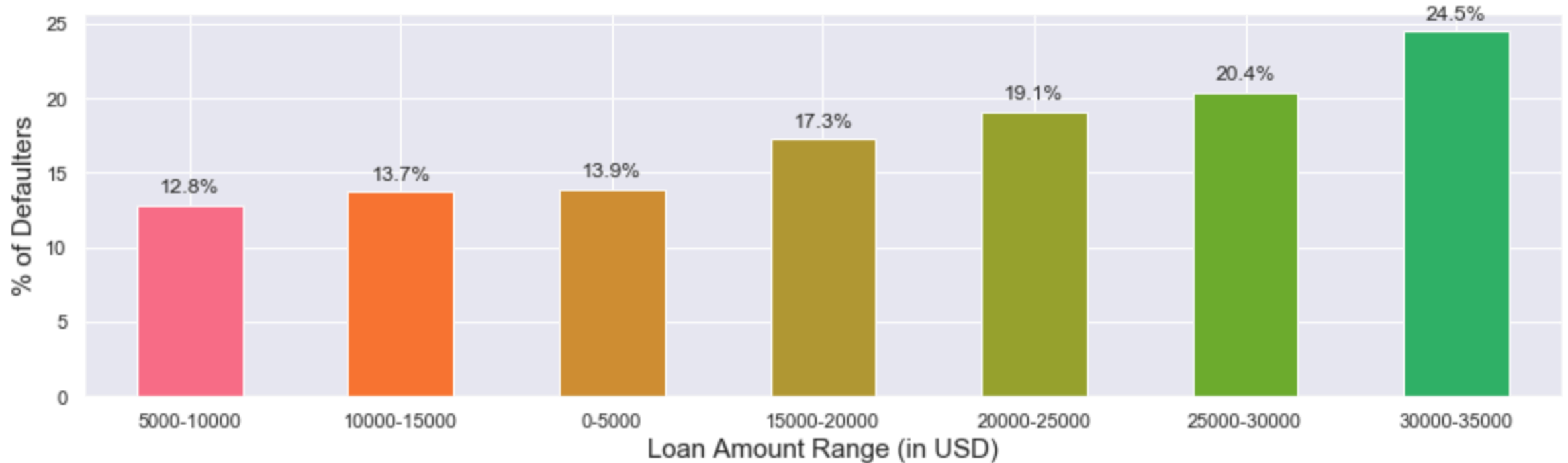
% of loan defaulters on basis of sub-grade



- As the grade increases from A to G the default rate increases

- Default rate increases from A1 to A2 to A3 to A4 and so on.
- Highest default rate is observed for subgrade F5

% of loan defaulters on basis of annual income

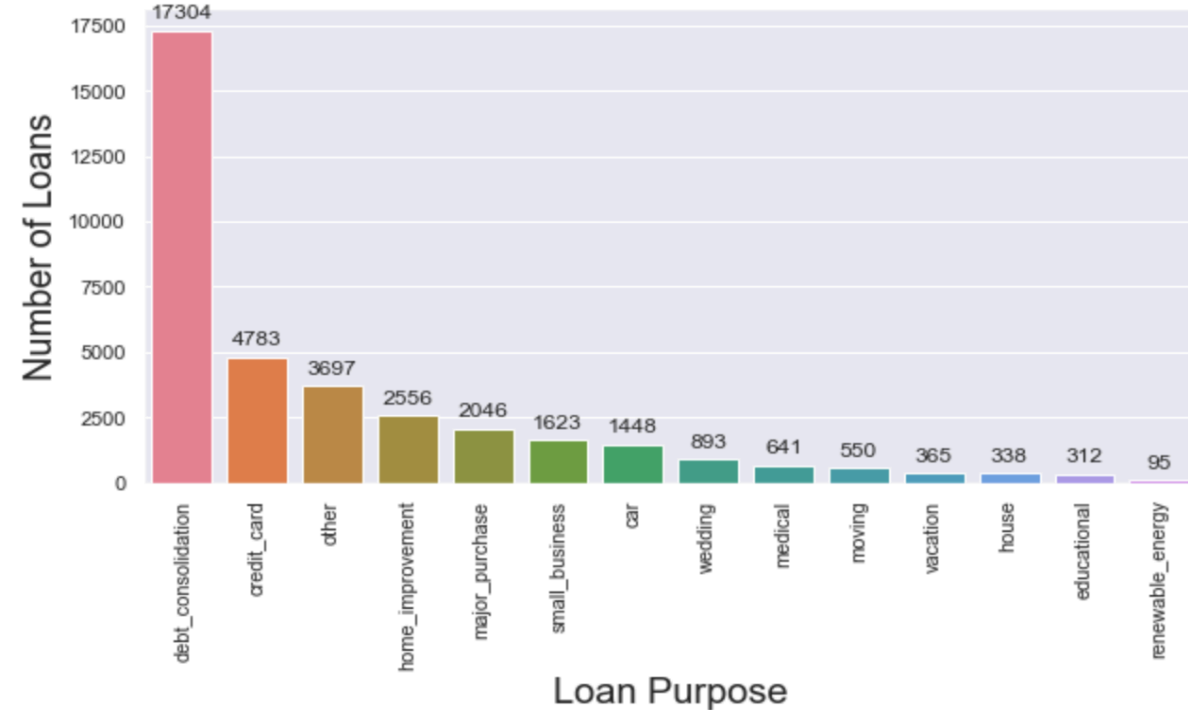


- Higher the loan amount , higher is the default rate.
- Default rate is highest for loan amount between 30000-35000 USD.



Analysing Loan Purpose – By Frequency distribution UpGrad & default rate

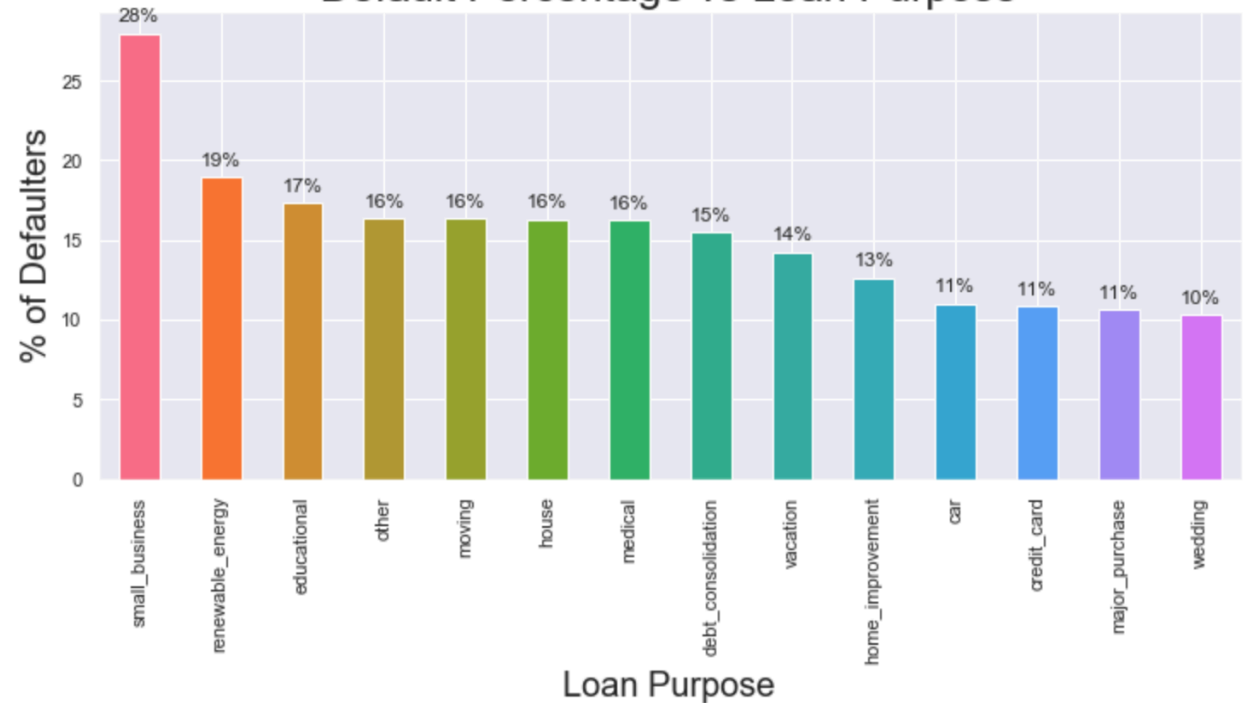
Frequency distribution plot for loan purpose



Popular loan purpose:

- Debt Consolidation
- Credit Card
- Other
- Home Improvement
- Major Purchase
- Small Business

Default Percentage vs Loan Purpose



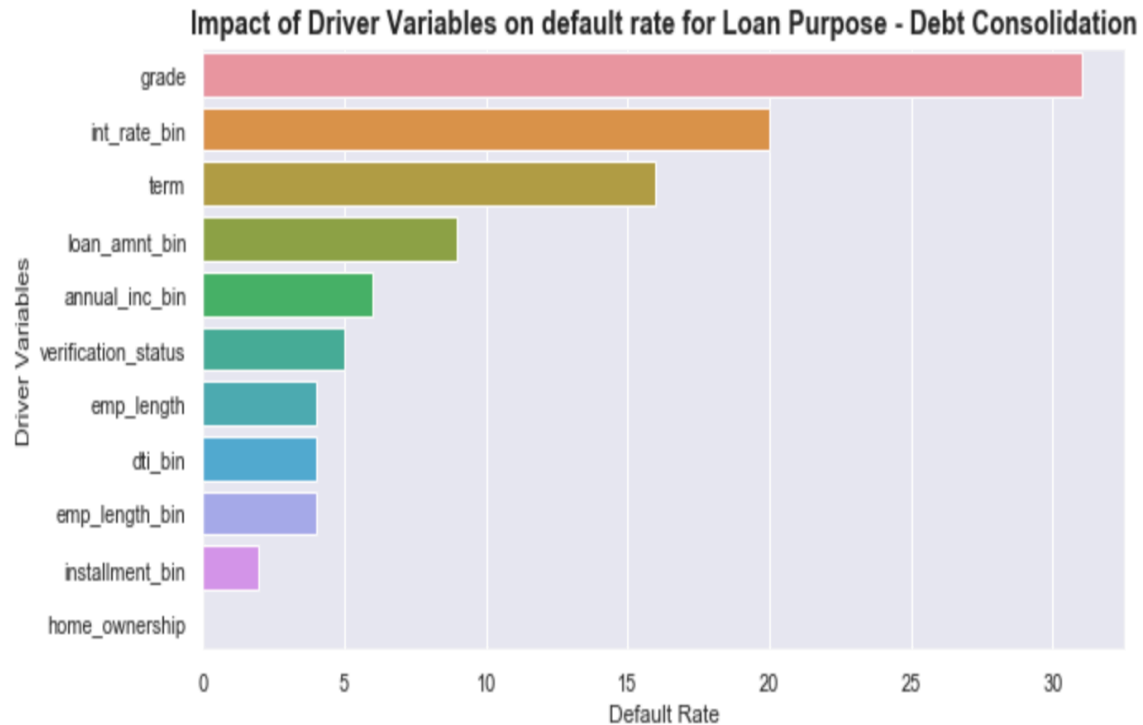
Default Rate : Popular Loan purpose

- Debt Consolidation 16%
- Credit Card 11%
- Other 16%
- Home Improvement 13%
- Major Purchase 11%
- Small Business 28%



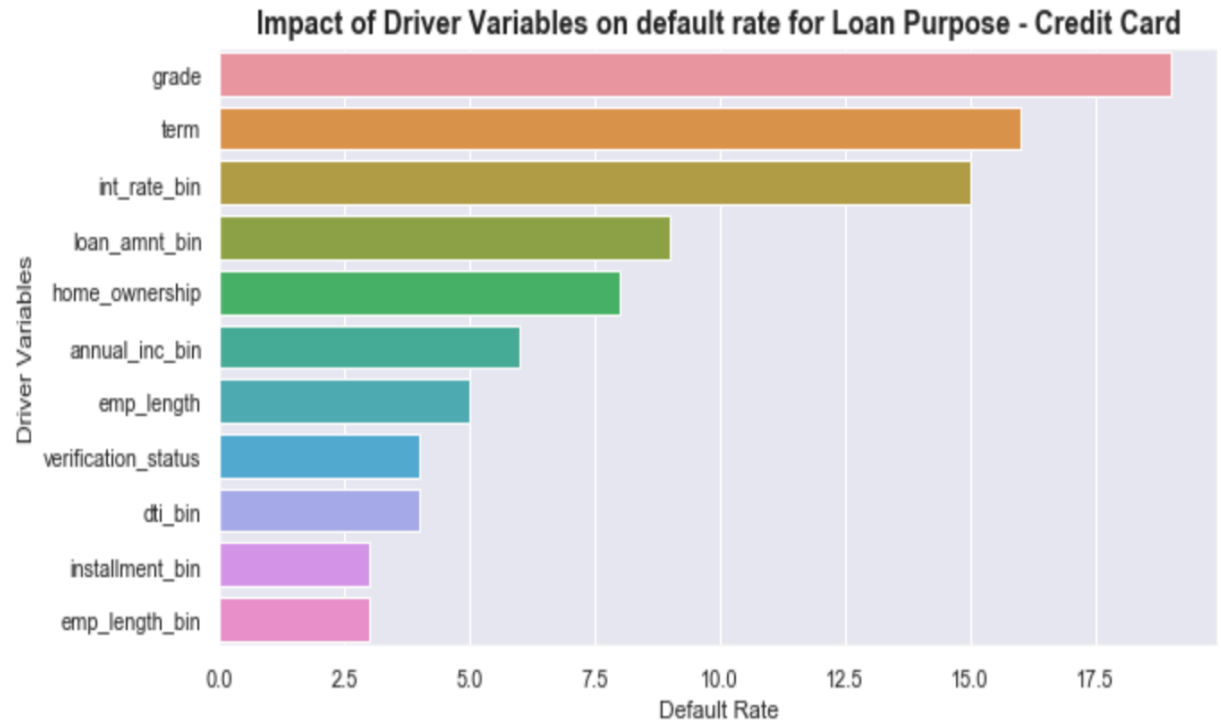
Top-5 Driver Variables for Loan Purpose - Debt Consolidation UpGrad & Credit Card

Debt Consolidation



1. Grade
2. Int Rate
3. Term
4. Loan Amount
5. Annual Income

Credit Card

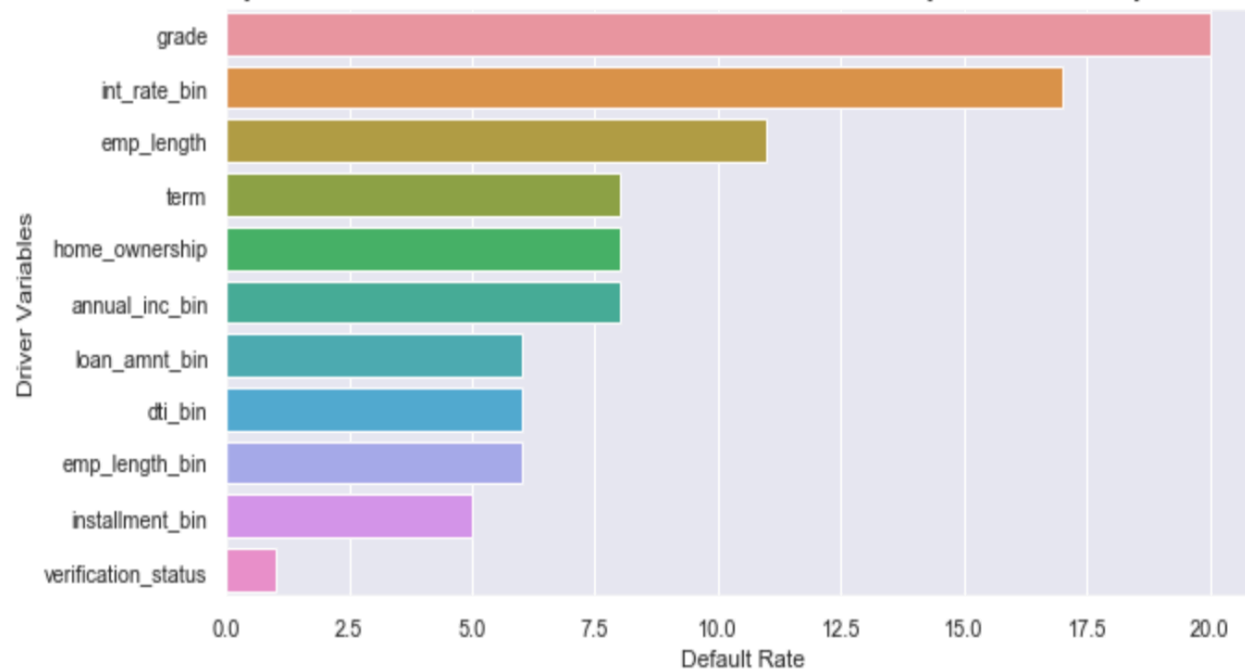


1. Grade
2. Term
3. Int Rate
4. Loan Amount
5. Home ownership

Top-5 Driver Variables for Loan Purpose - Home Improvement & Major Purchase

Home Improvement

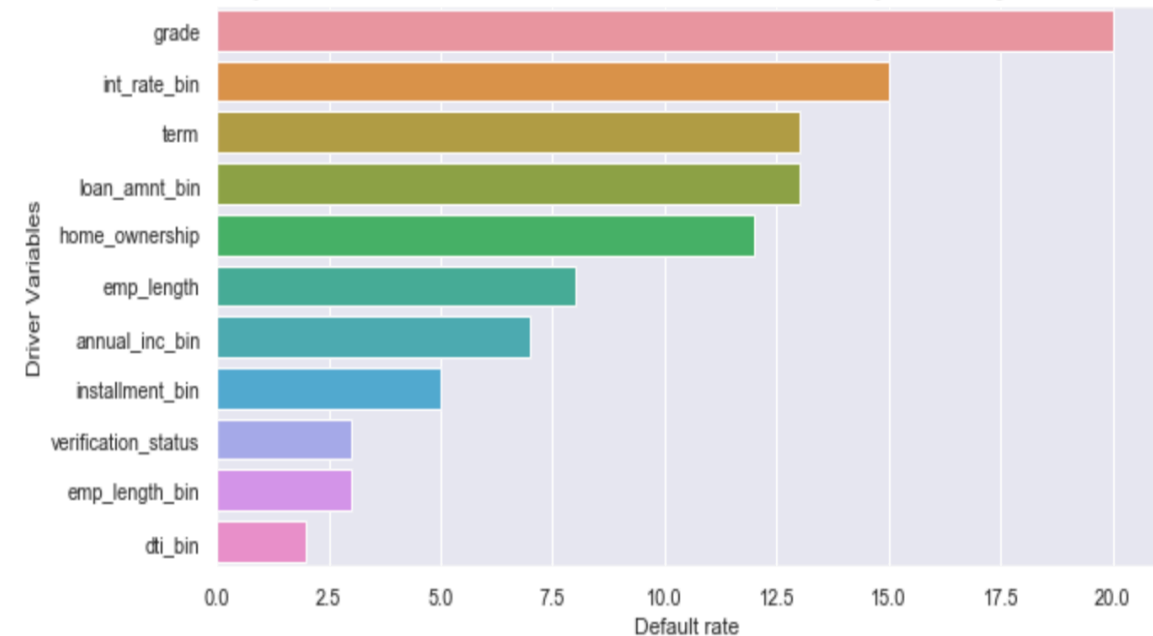
Impact of Driver Variables on default rate for Loan Purpose - Home Improvement



1. Grade
2. Int Rate
3. Emp Length
4. Term
5. Home Ownership

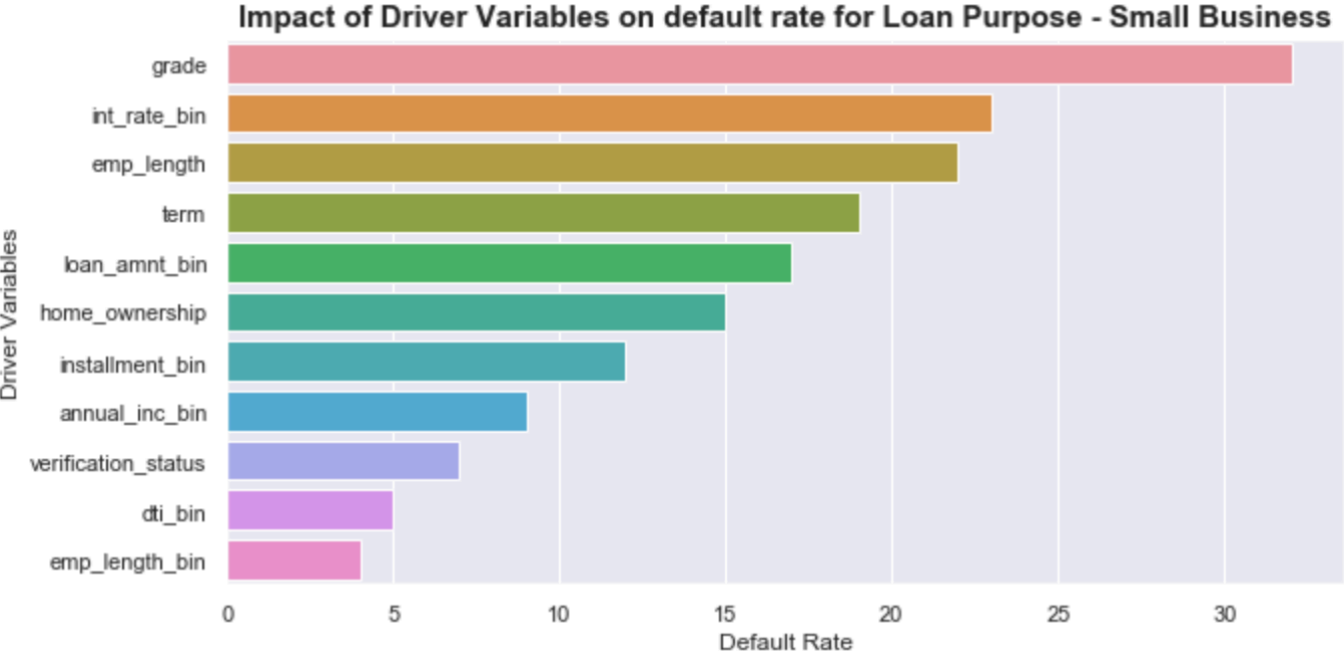
Major Purchase

Impact of Driver Variables on default rate for Loan Purpose - Major Purchase



1. Grade
2. Int Rate
3. Term
4. Loan Amount
5. Home ownership

Top-5 Driver Variables for Loan Purpose - Small Business



1. Grade
2. Int Rate
3. Emp Length
4. Term
5. Loan Amount

Overall Top 5 Driving Variables :

- 1. Purpose of Loan** – loan purpose “small_business” has the highest % of default rate
- 2. Term** – Loans granted for 60-month term have higher default rate when compared to loans with 36-month term.
- 3. Grade/Interest Rate** – Interest rate is decided on basis grade, hence they are positively correlated. If grade increases from A to B ,then interest rate also increases. With the increase in grade/int rate the loan default rate also increases. Default rate is highest for grade “G” which also has the highest interest rate.
- 4. Loan Amount** – Higher the loan amount , more is the loan default rate.
- 5. Annual Income** - Lower the borrower’s annual income, Higher are the chances of default.