Lending Club - Case Study

SUBMISSION

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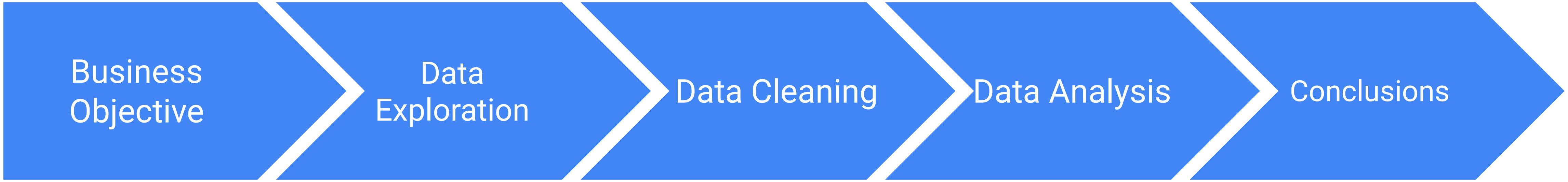
Introduction & Objective

- Lending Club is an online loan marketplace that provides easy and quick loans to borrowers at low interest rates.
- Borrowers who default on their loans are the largest cause for loss for Lending Club.
- Lending Club wants to understand the driving factors behind loan default.
- The objective of this case study is to use EDA techniques to analyze the loan data provided by Lending Club and identify the driving factors and generate observations and recommendations.

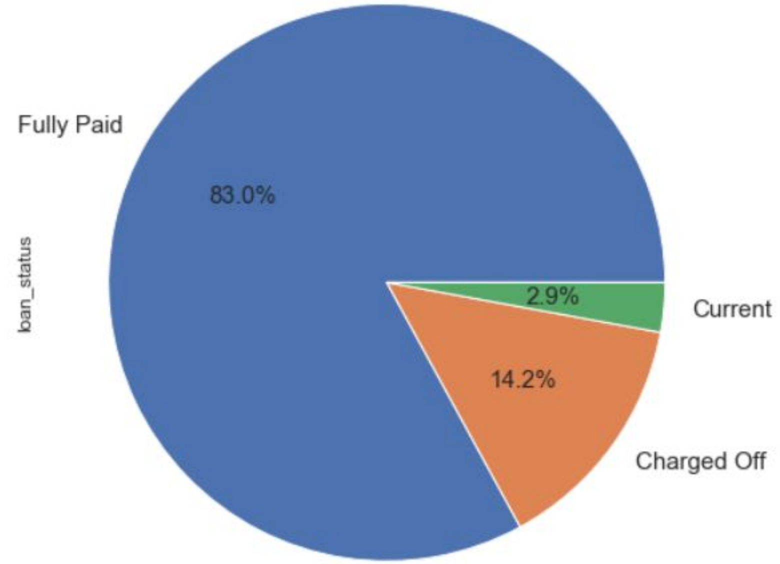
Problem Solving Methodology



Data Overview

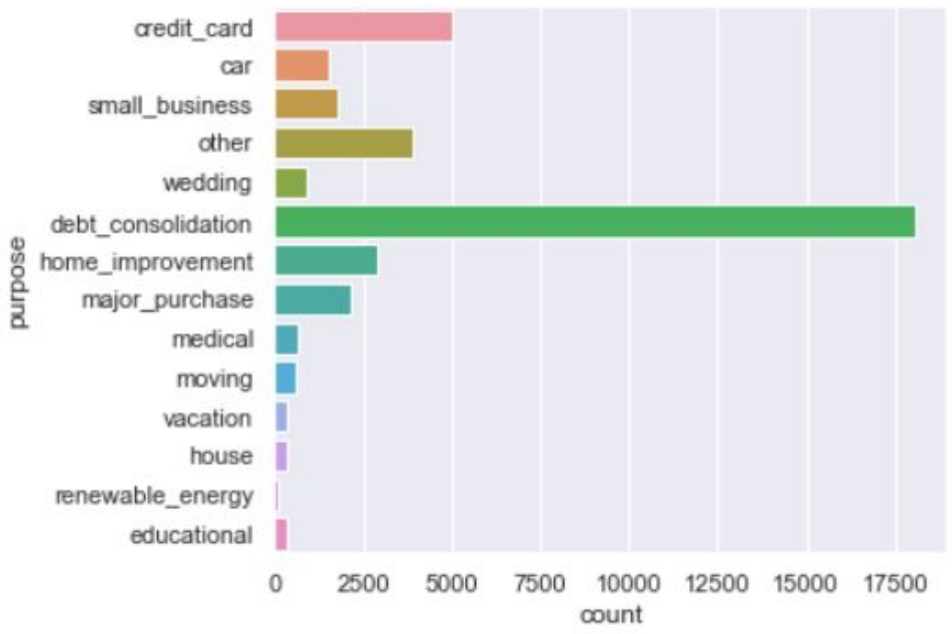
The Dataset consists of 39717 loans.

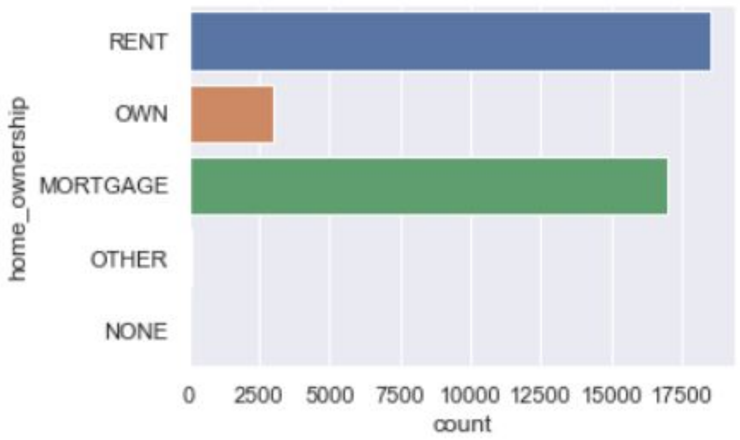
- There are 3 types of loans:
    - Fully Paid (Non-Default)
    - Charged Off (Default)
    - Current (Excluded from analysis)

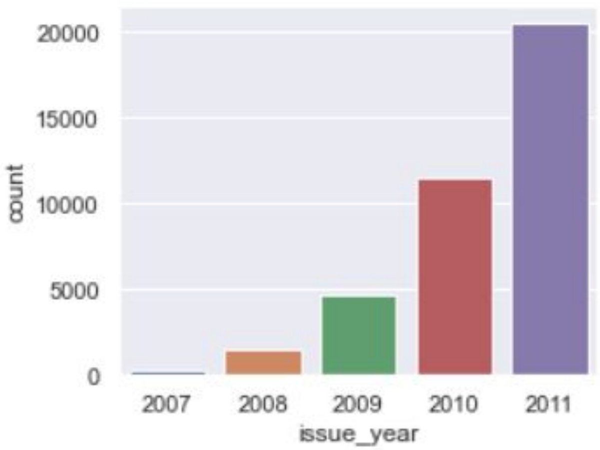


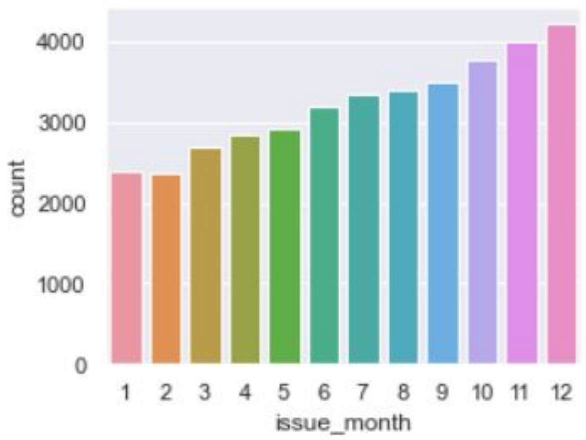
Analysis

- Most of the loans are of short term (36 months)
- Most of the loans are for debt consolidation purpose
- Most of the loans are taken by people who live in a rented accomodation or mortgaged properties.
- Loan count has an increasing trend both month-wise (Jan-Dec) and year-wise (2007-2011)



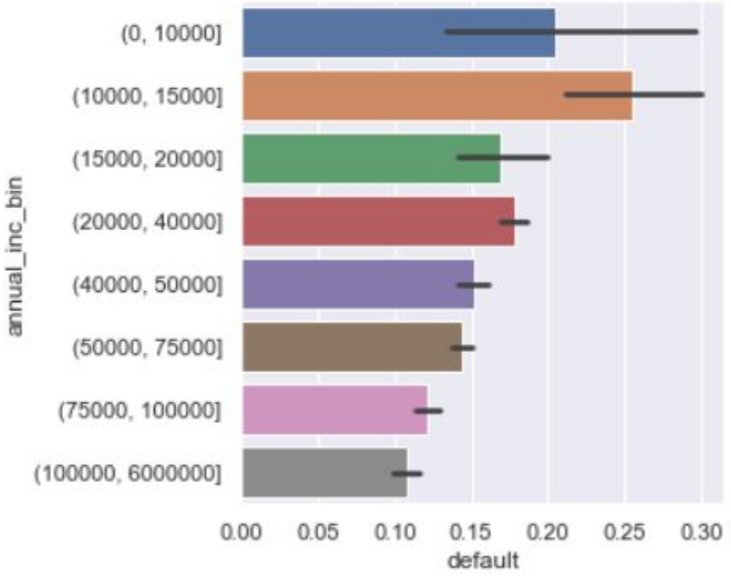


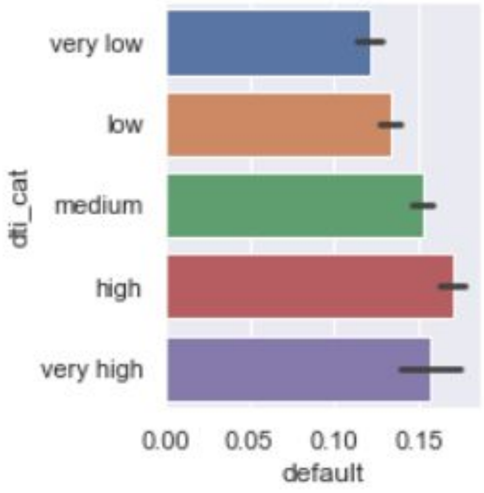


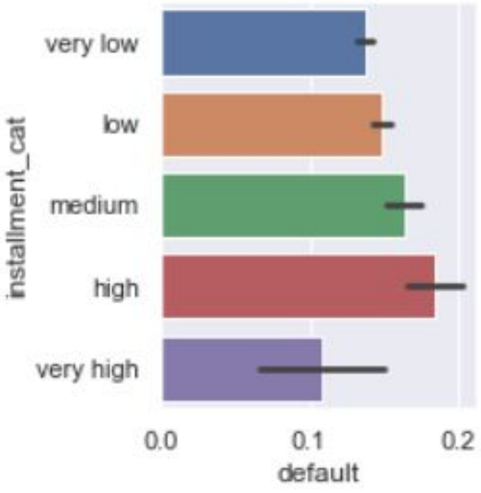


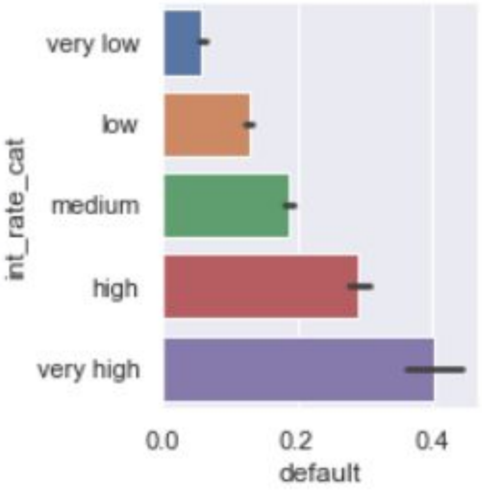
Analysis

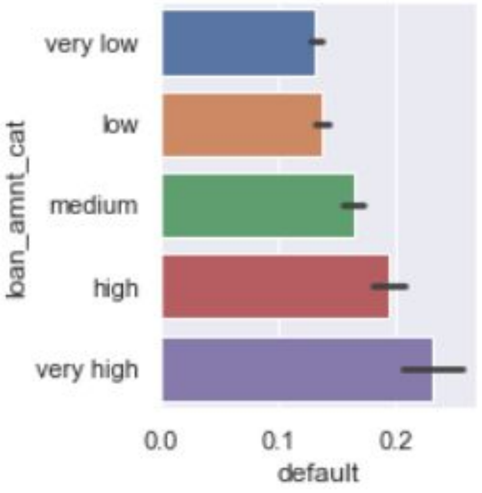
- Higher the annual income, lower the default rate
- Borrowers with annual income more than **15000** are less likely to default
- Higher the dti (Debt-to-income ratio), higher the default rate
- Higher the interest rate, higher the default rate
- Higher the loan amount, higher the default rate





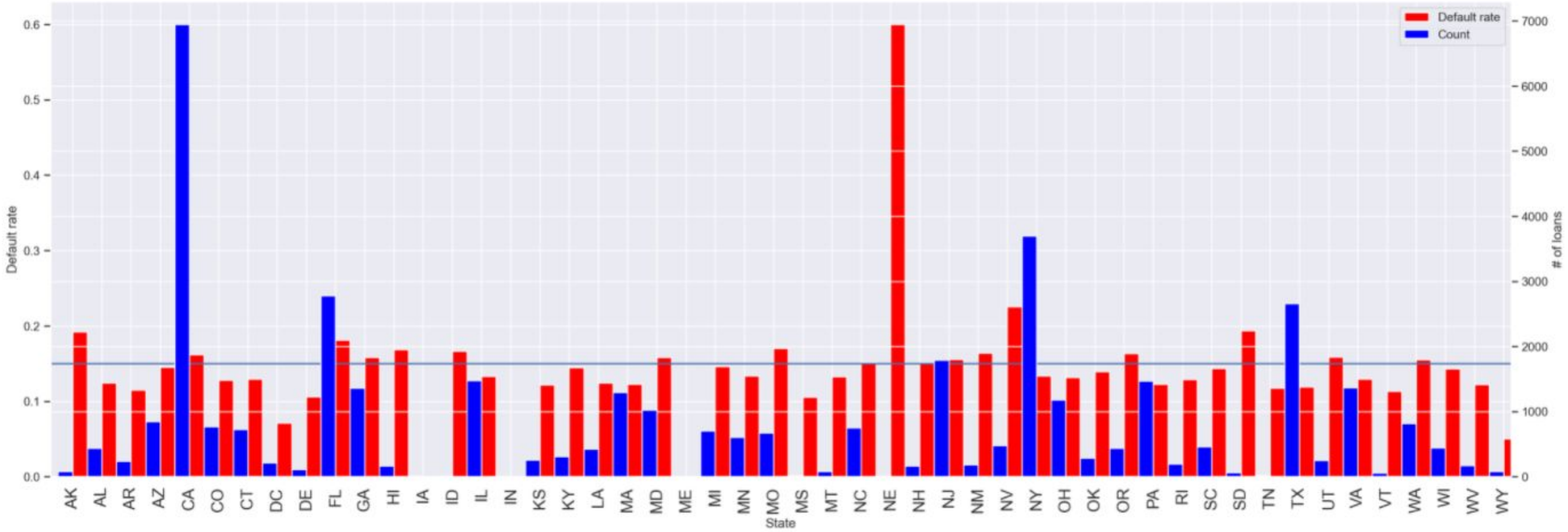






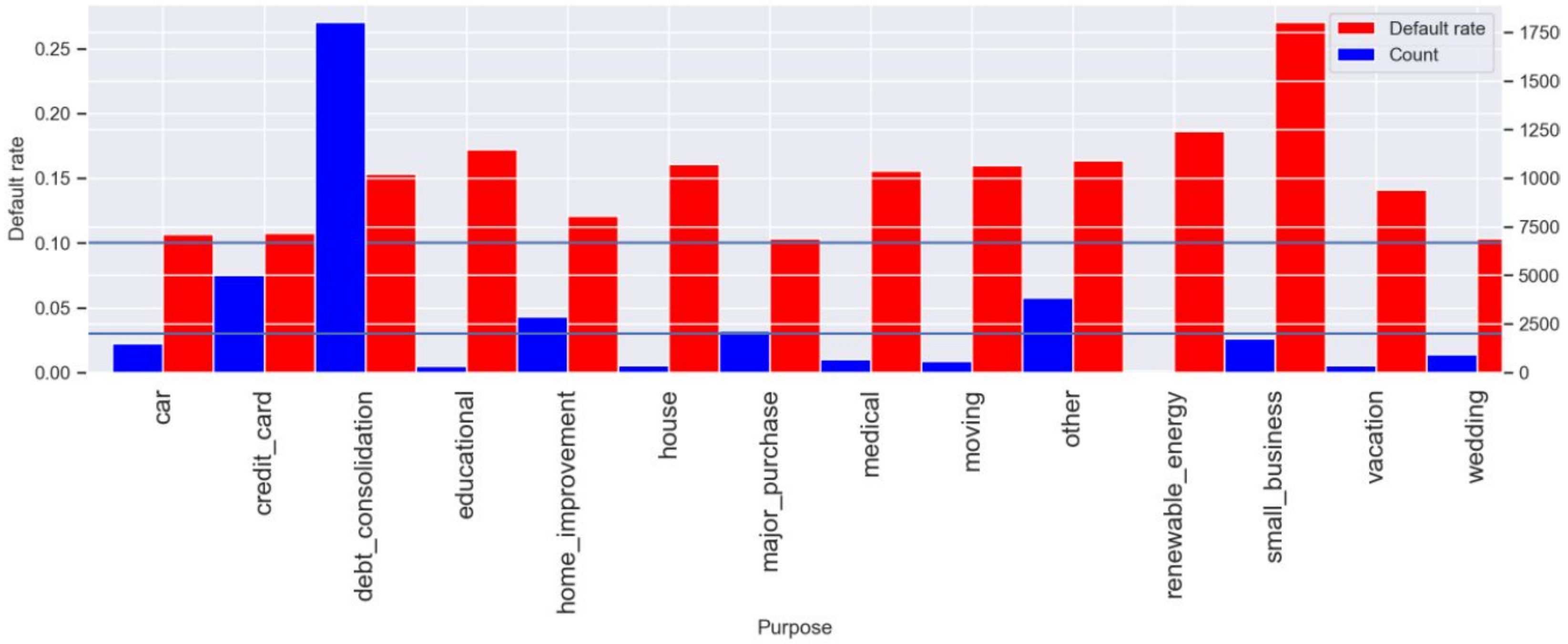
Analysis

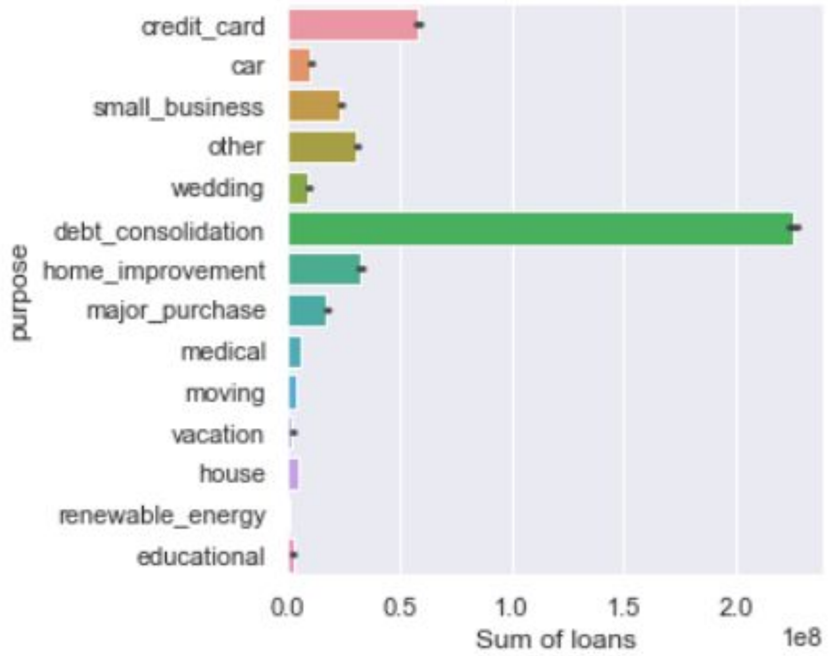
- Most of the borrowers are from states with high population like (CA, NY, NJ, FL): at least 2000 loans. Their default rate is also high (>=15%)
- Nebraska have highest default rate but total no. of loans from NE is 5
- Nevada (NV) also has high default rate



Analysis

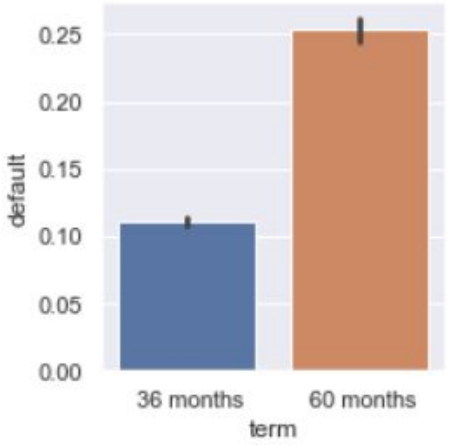
- credit_card, debt_consolidation, home_improvement, major_purchase are the purposes that have more than 2000 count and at least 10% default rate
- Most of the money is invested in debt_consolidation and their default rate is also pretty high (above 15%).

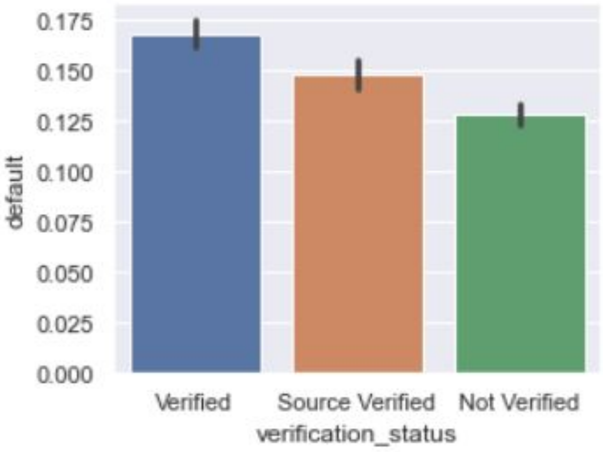


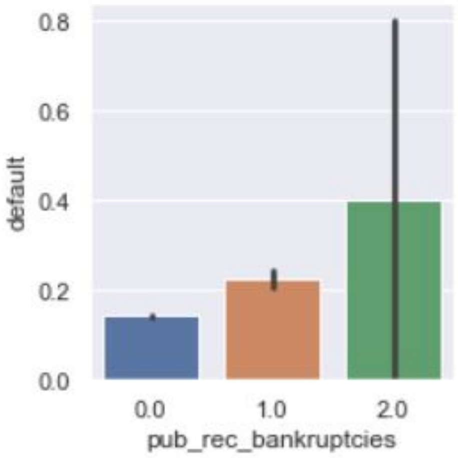


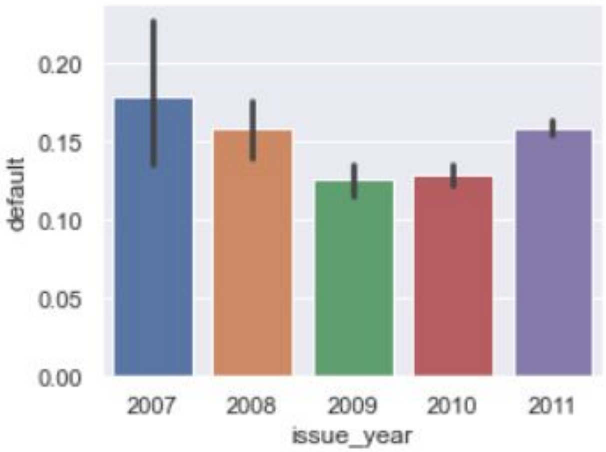
Analysis

- Loans with term of 60 months are (~15%) more likely to default than loan with term of 36 months.
- Verified loans highest default rate followed by Source Verified, with Not Verified loans having least default rate
- Borrowers who went bankrupt before are most likely to default. People having 2 records of bankruptcies have a higher probability to default than people with no bankruptcy report
- Loans issued in 2009 (After 2007-2008 banking crisis) the default rate decreased probably due to safer lending.



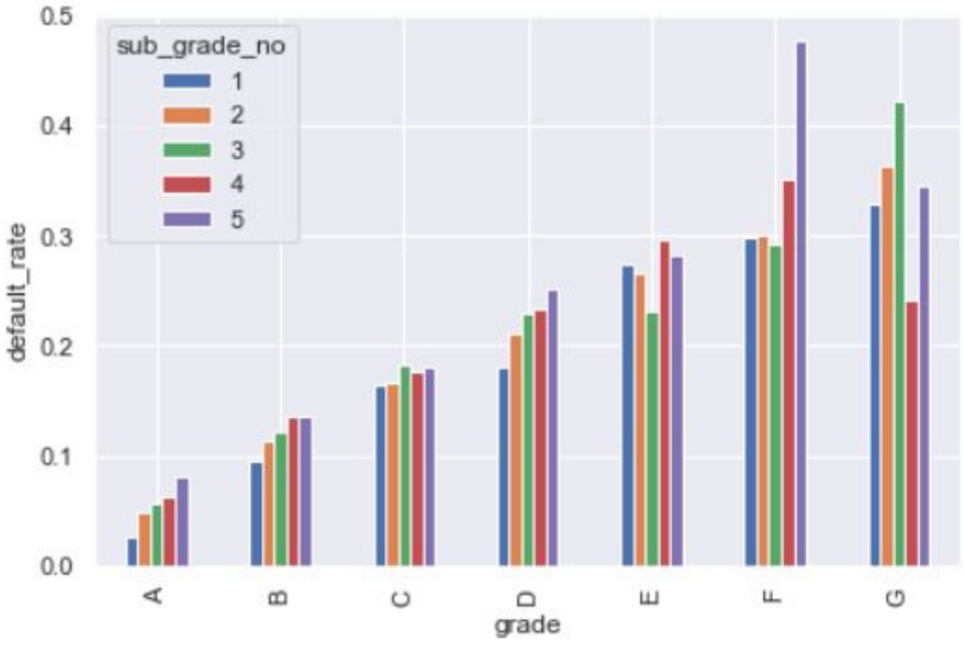


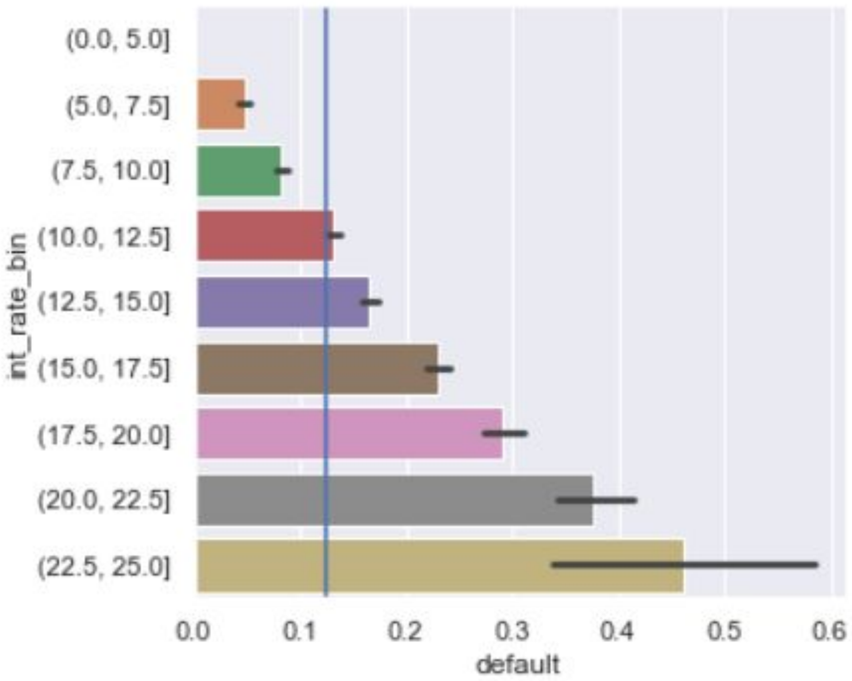




Analysis

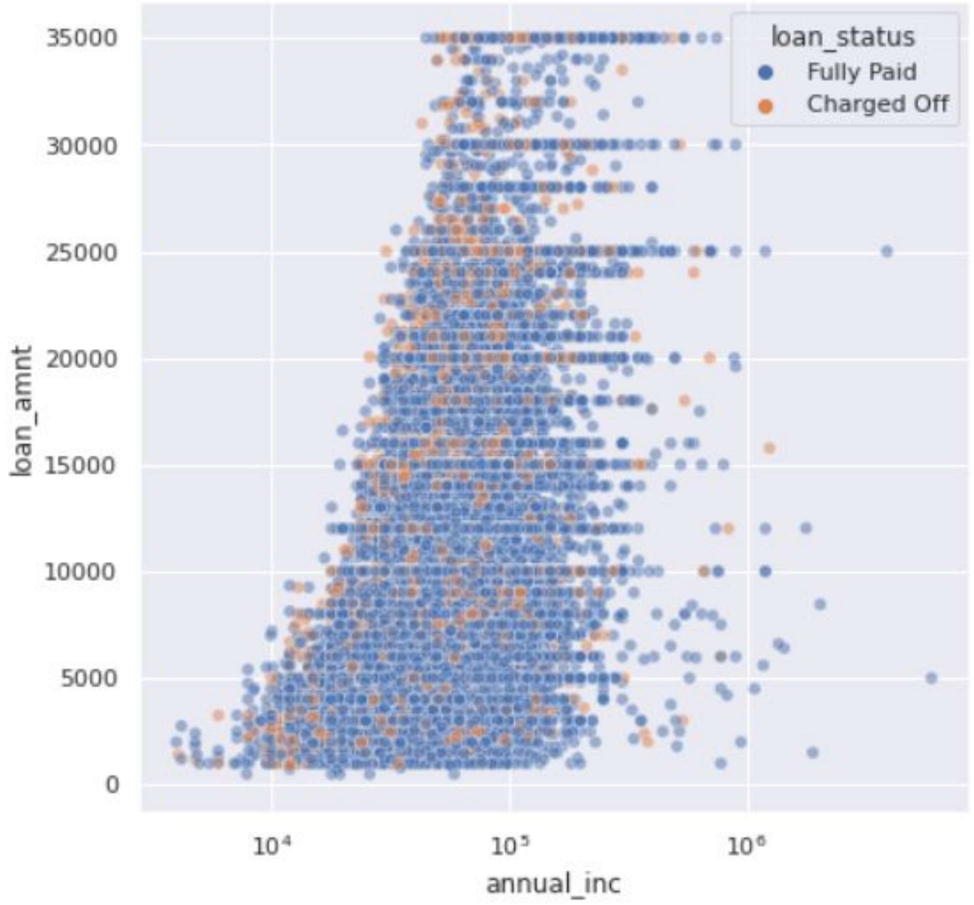
- Default Rate is high for Grade >='C’.
- Among them F5 and G3 stands out having default rate over 40%.
- A steep increasing trend in default rate can be seen for loans with interest more than 12.5%.
- For interest rates greater than 20%, the default rate goes beyond 30%.





Analysis

- Borrowers with higher Annual income go for higher loan amount



Recommendations

Our recommendation is to modify the loan approval/grant process based on these factors.

Stop High Risk Loans

- Borrower who declared bankruptcy more than once
- Borrower with Grade F
- Loans with interest rate more than 20%

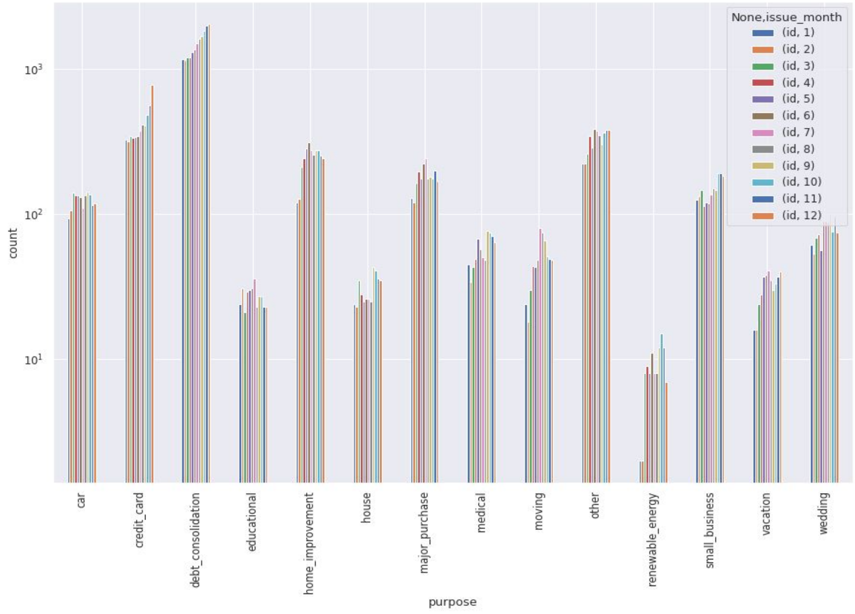
Reduce Medium Risk Loans

- Borrower who declared bankruptcy once
- Borrower with Grade > 'C' i.e.
- Loans with interest rate more than 12.5%
- Borrowers with annual income less than 15000
- State in (FL, NY, NV, CA, TX, NJ)
- Long term loans i.e. 60 months

Increase Low Risk Loans

- Borrowers with no record of bankruptcy
- Borrower with Grade 'A'
- Loans with interest rate 7.5-10%
- Short term loans i.e. 36 months
- Loans for credit card
- Lesser loan amount
- Borrower with lower debt-to-income ratio

Observations



- Safer investments leads to lower default rate as we have seen in the year of 2009
- Number of loans increase with the month of the year. Only two of the purpose of the loans can be seen having increasing trend with month which are credit_card & debt_consolidation and these are top 2 reasons for loans.

- Interest go higher with the Grades