Lending Club Case Study: Assignment

Lending Club: EDA Case Study – Problem Statement

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What is Lending Club?

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

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

Lending Club: EDA Case Study – Problem Statement

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If one is able to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss. Identification of such applicants using EDA is the aim of this case study.

In other words, the company wants to understand the **driving factors (or driver variables)** behind loan default, i.e. the variables which are strong indicators of default. The company can utilize this knowledge for its portfolio and risk assessment.

DATA ANALYSIS – OBSERVATIONS

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Listing out strong indicators of loan default.

- Applicants having house_ownership as 'RENT’
- Applicants who use the loan to clear other debts
- Applicants who receive interest at the rate of 13-17%
- Applicants who have an income of range 31201 - 58402
- Applicants who have 20-37 open_acc
- Applicants with employment length of 10 years
- When funded amount by the investor is between 5000-10000
- Loan amount is between 5429 - 10357

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- Dti is between 12-18
- When monthly installments are between 145-274
- When Loan Term is 36 months
- When the Income verification status is Not verified
- When the no of enquiries in the last 6 months is 0
- When the number of derogatory public records is 0
- When the loan purpose is 'debt_consolidation’
- When the loan Grade is 'B’ And a total grade of 'B5' level.
- The late months of the year indicated the high possibility of defaulting.

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- The high number of loan defaults in 2011 could be due to the financial crisis in USA (Assuming the data is of US origin)
- Applicants taking loan for 'home improvement' and have annual income of 60k - 70k
- Applicants whose home ownership is 'MORTGAGE and have annual income of 60-70k
- Applicants who receive interest at the rate of 21-24% and have annual income of 70k-80k
- Applicants who have taken a loan in the range 30k - 35k and are charged interest rate of 15-17.5 %
- Applicants who have taken a loan for small business and the loan amount is greater than 14k
- Applicants whose home ownership is 'MORTGAGE and have a loan amount of 12k

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- When loan grade is F and loan amount is between 15k-20k
- When employment length is 10yrs and loan amount is 12k-14k
- When the income is verified and the loan amount is above 14k
- For loan grade G and interest rate above 20%

Visualizations – Univariate Analysis

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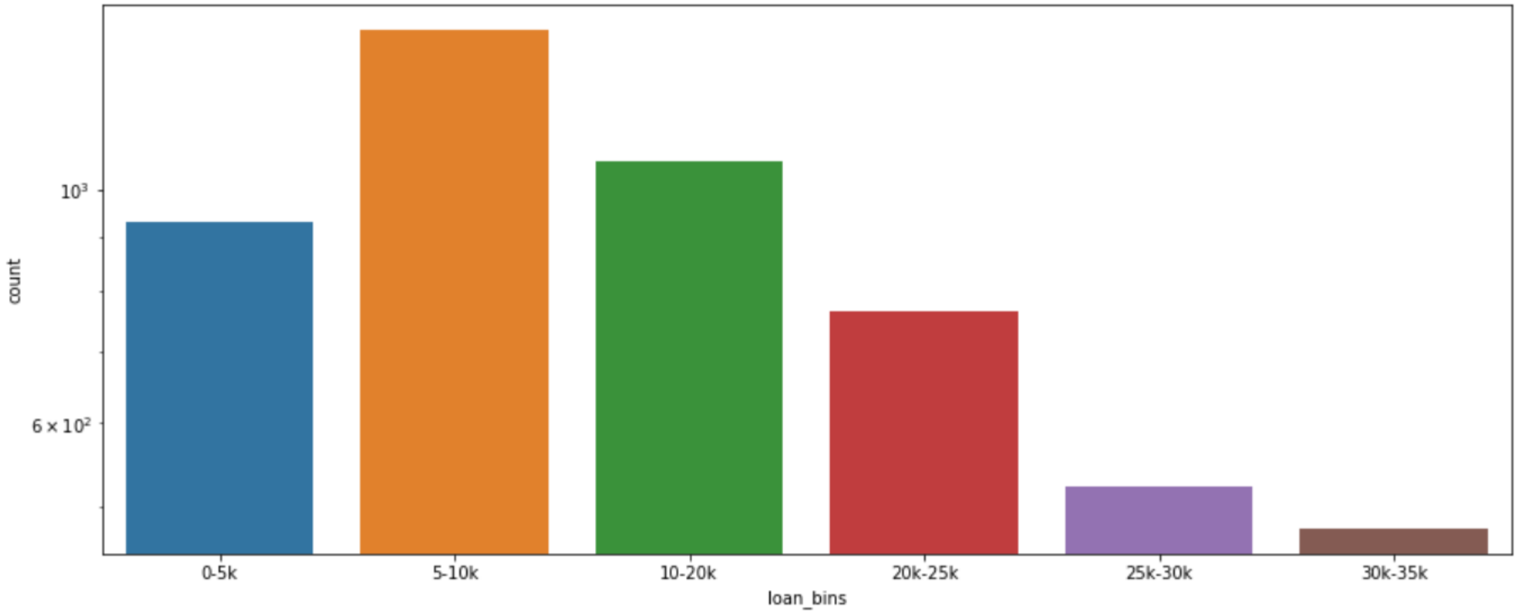
Loan Amount vs Charged off Loan Status



Maximum No of people to default on the loans are those given loan between 5-10k

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Loan grade of applicants who have defaulted on the loan

From the plot, it seems Loan Borrowers with Loan Grade B are prone to default loan

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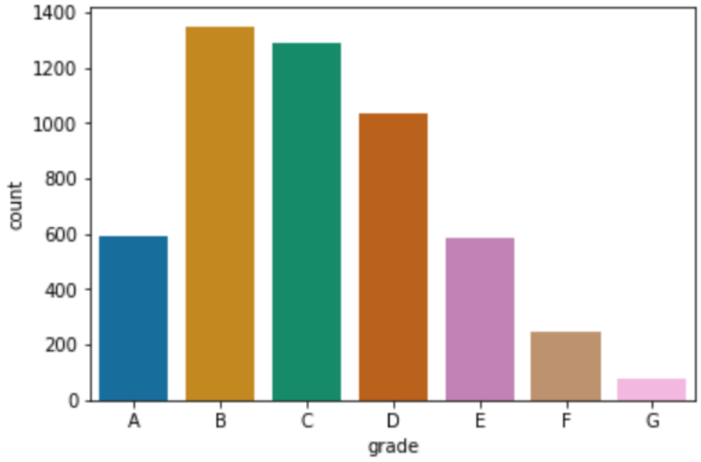
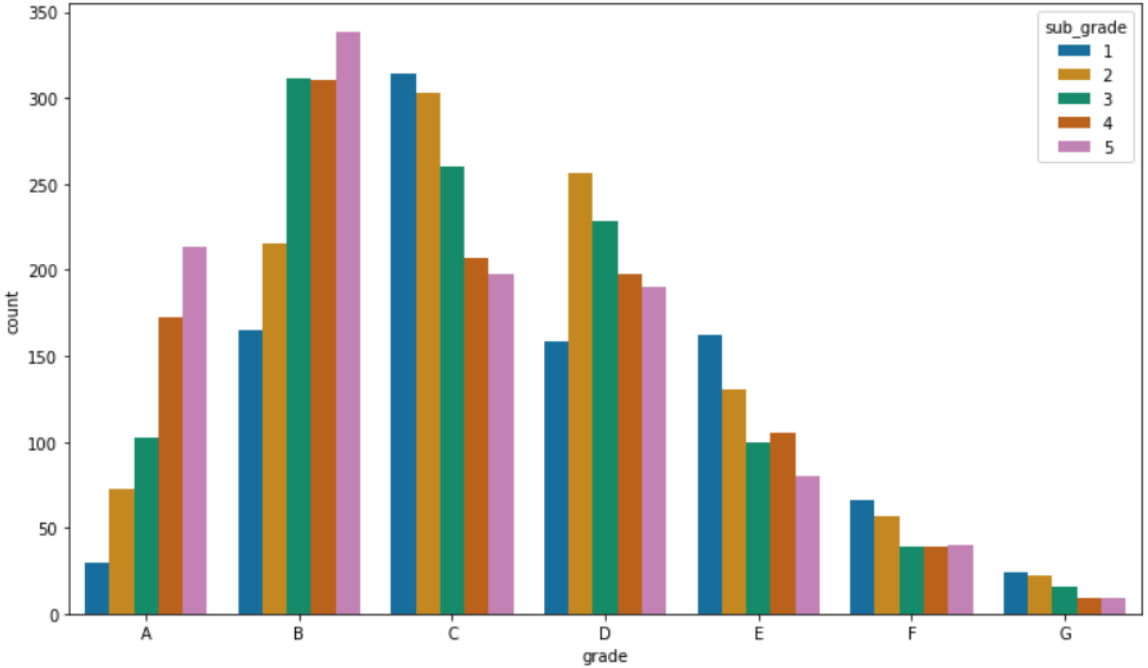


Loan sub grade of applicants who have defaulted on the loan

It seems Loan Borrowers with Loan Sub Grade 5 and total grade B5 are prone to default loan



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Distribution of Housing own and rent by charged-off loans

Applicants with rent house are unlikely to repay the loan

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Analyzing loan Issue date with charged-off loan status

The maximum number of defaults occurred when the loan was issued in Dec.

And for Loans issued in 2011

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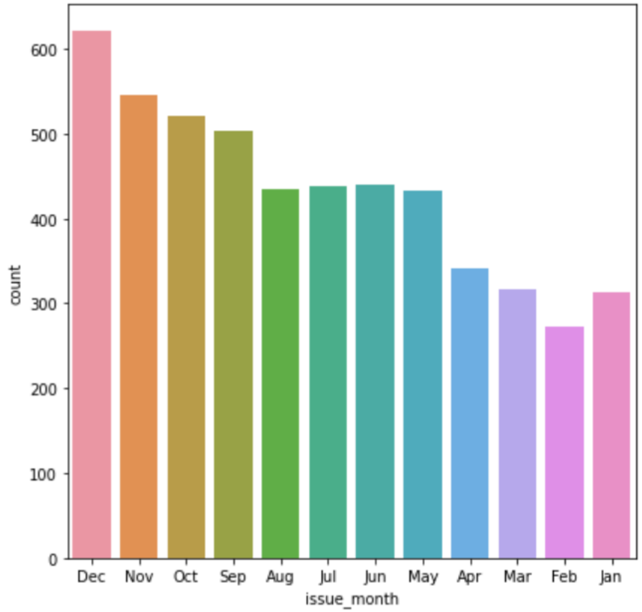

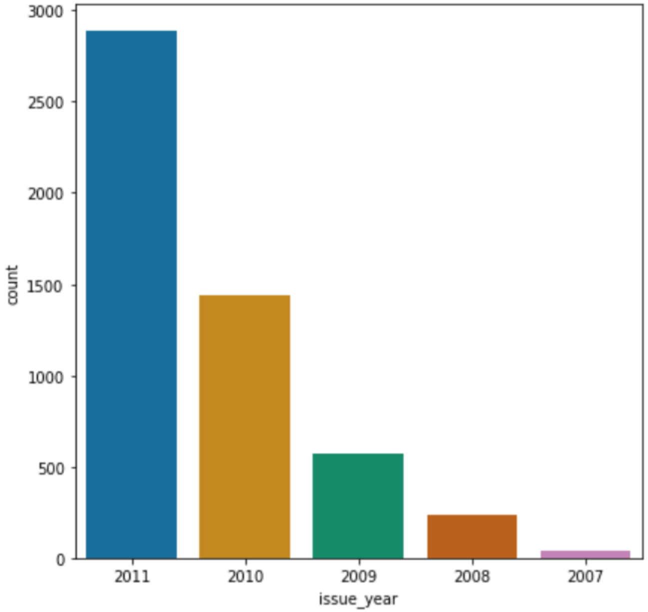

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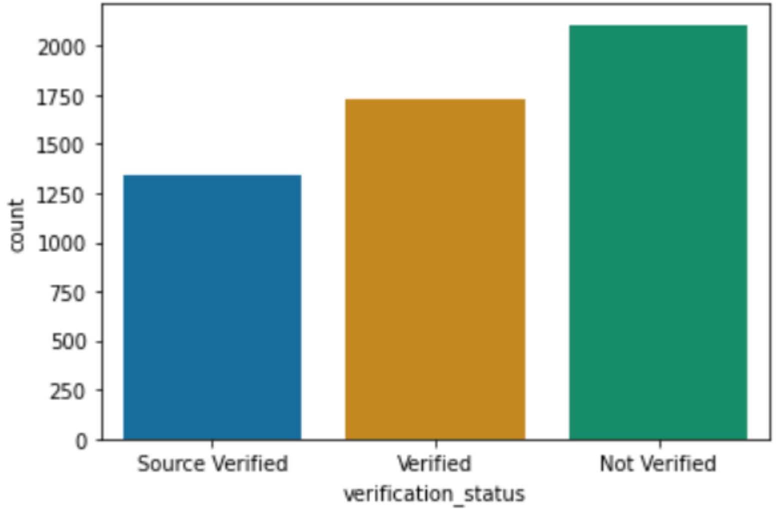
Income Verification Status Vs Charged-Off Loans

Applicants whose income is not verified are more prone to default loan



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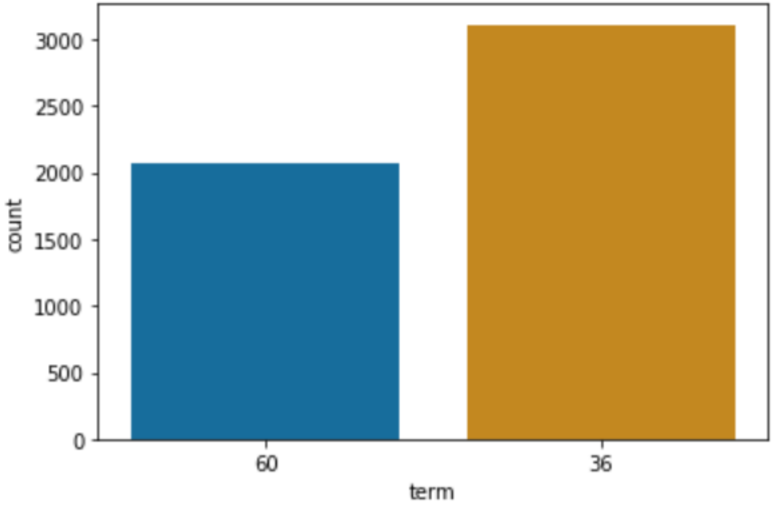
Effect of Loan term with charged off loan status

Applicants whose Loan term is 36 months are more prone to default the loan



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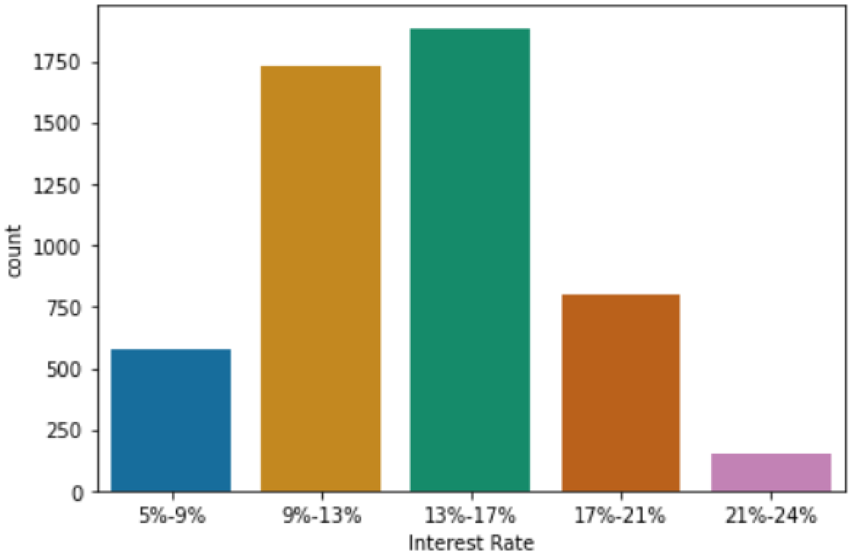
Plotting the interest rate of applicants who have charged-off loan status

Applicants with an interest rate of 13-17% are prone to default on the loan



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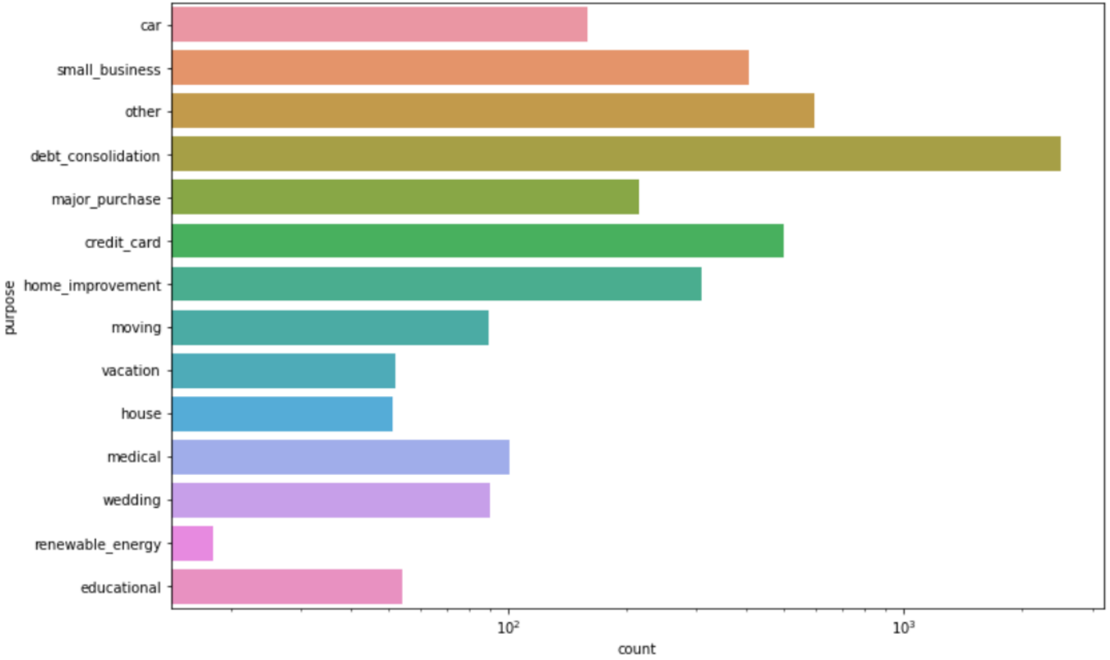
How Loan Purpose Effects Charged Off Loan Status

There are more chances to default loan if the loan purpose is debt_consolidation



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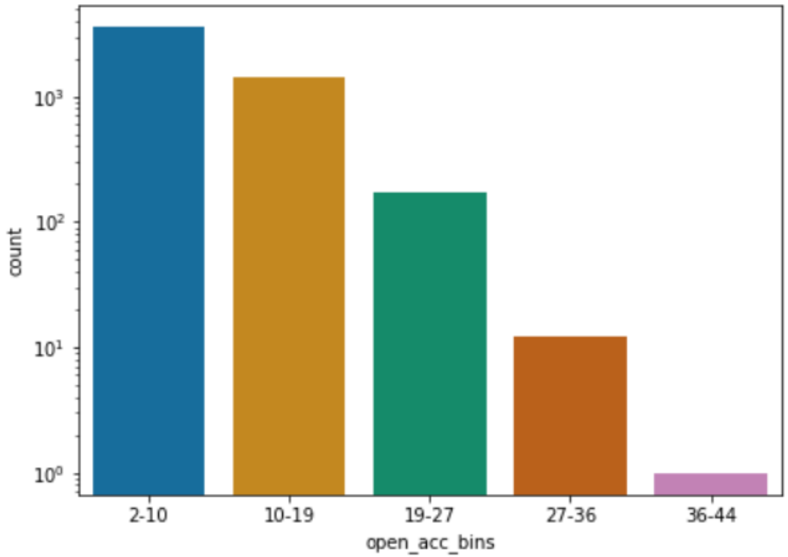
Applicants who have 2-10 open accounts are more prone to default



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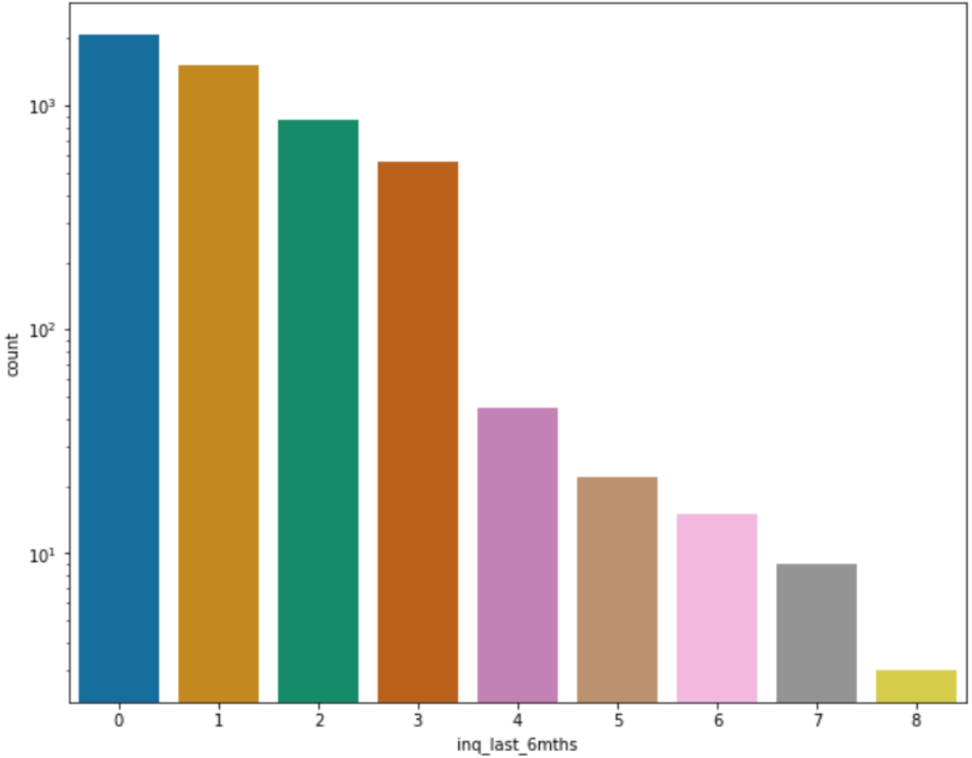
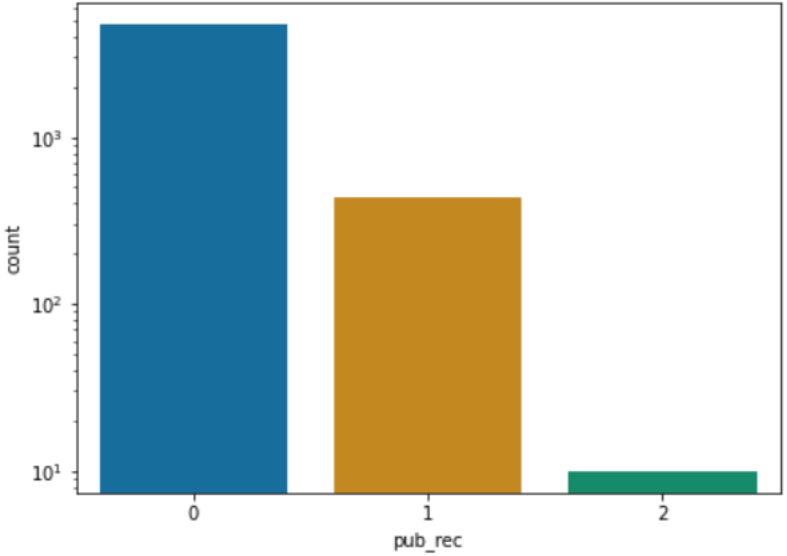
Applicants who have not inquired about loans in the past 6 months are more prone to default



Applicants with no derogatory public records are prone default loan



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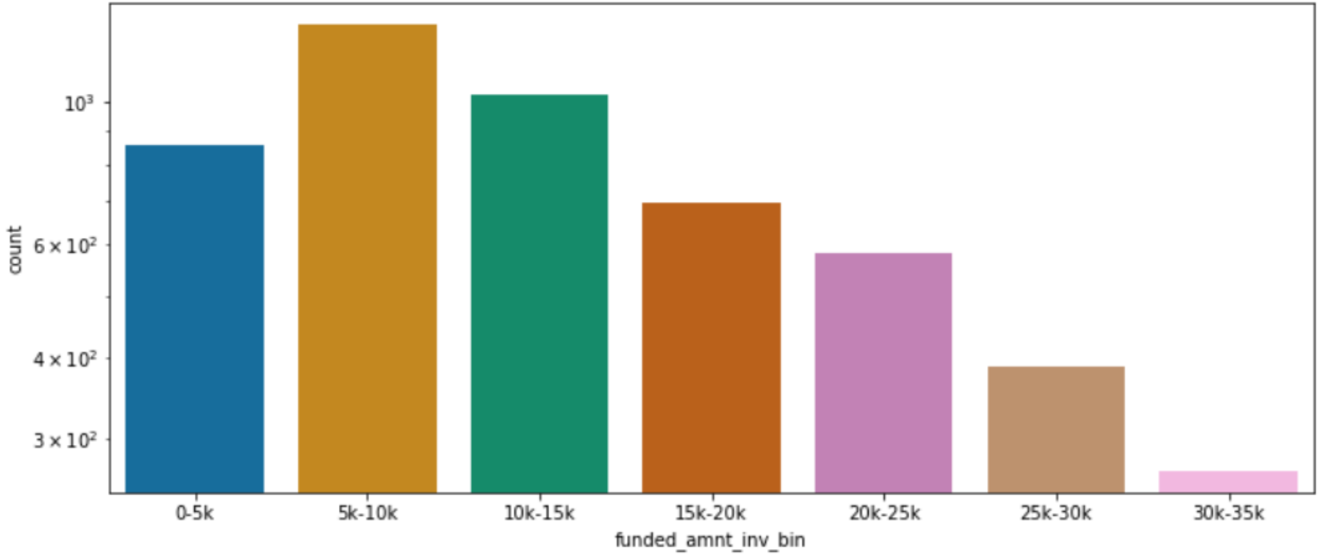
Applicants to whom the amount funded by the investor is between 5k-10k are more prone to default



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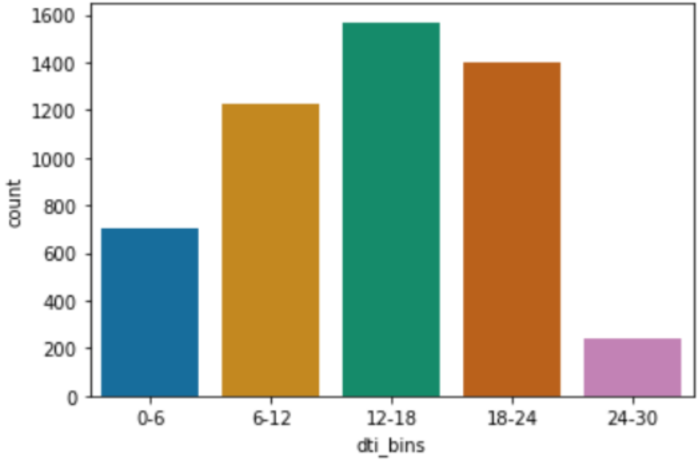
Applicants with Debt to Income between 12-18 have more chances to default



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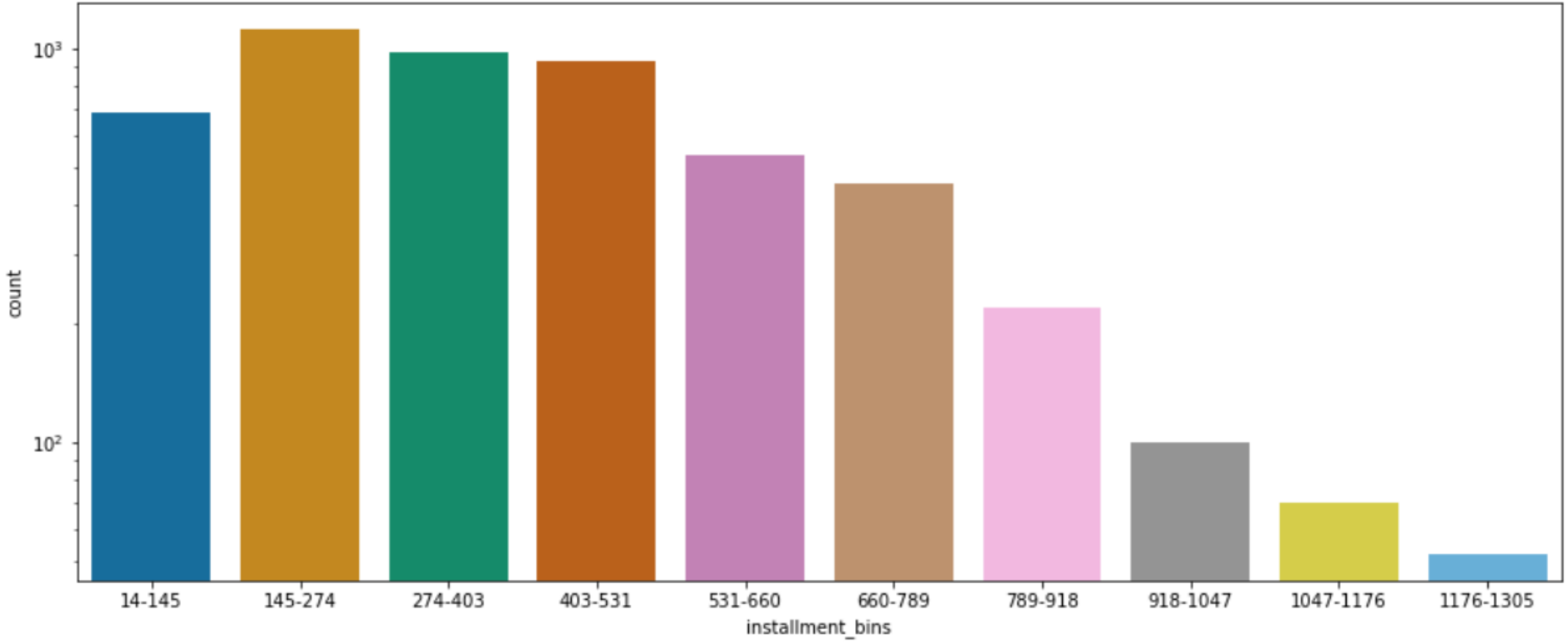
Applicants whose monthly installments are between 145-274 have more chances to default loan



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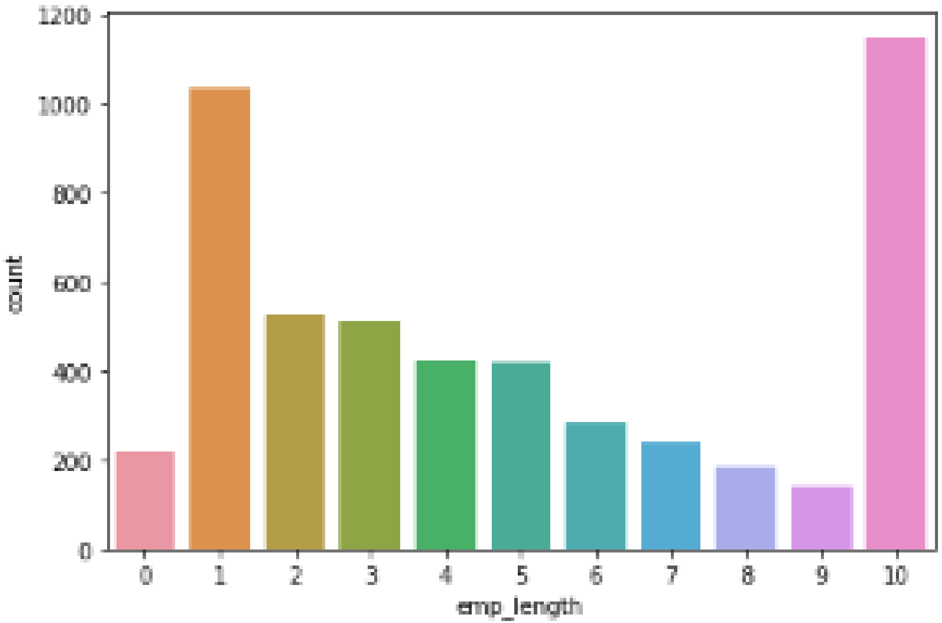
Applicants with employment length of 10 are prone to default



Visualizations – Bivariate Analysis

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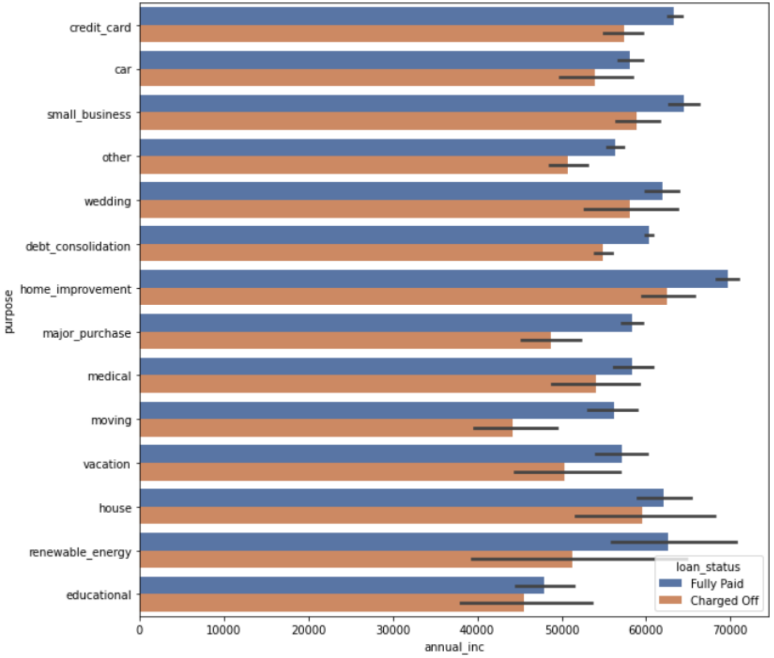
Applicants taking loan for home improvement and have an annual income of 60k-70k are more to default



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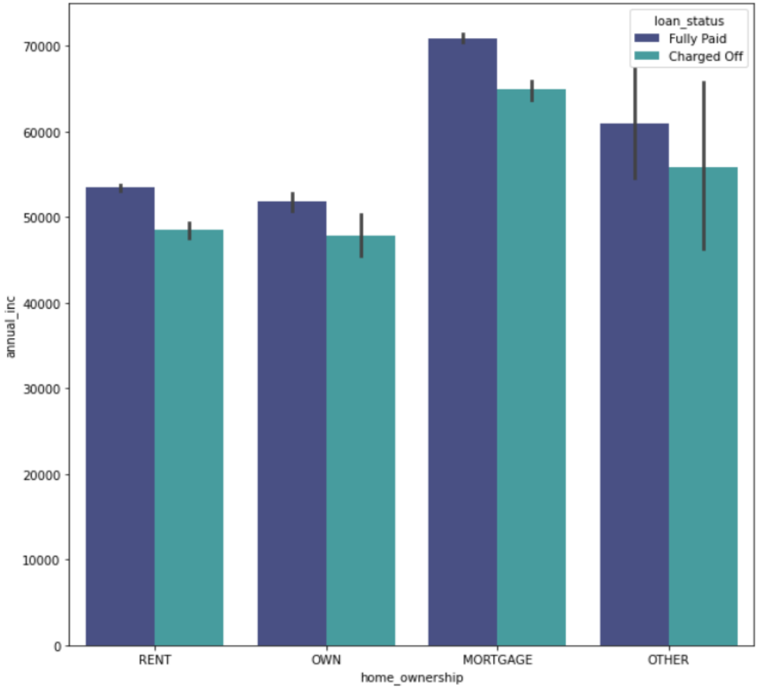
Applicants with Mortgage homes and have an annual income of about 60k-70k are more prone to default loan



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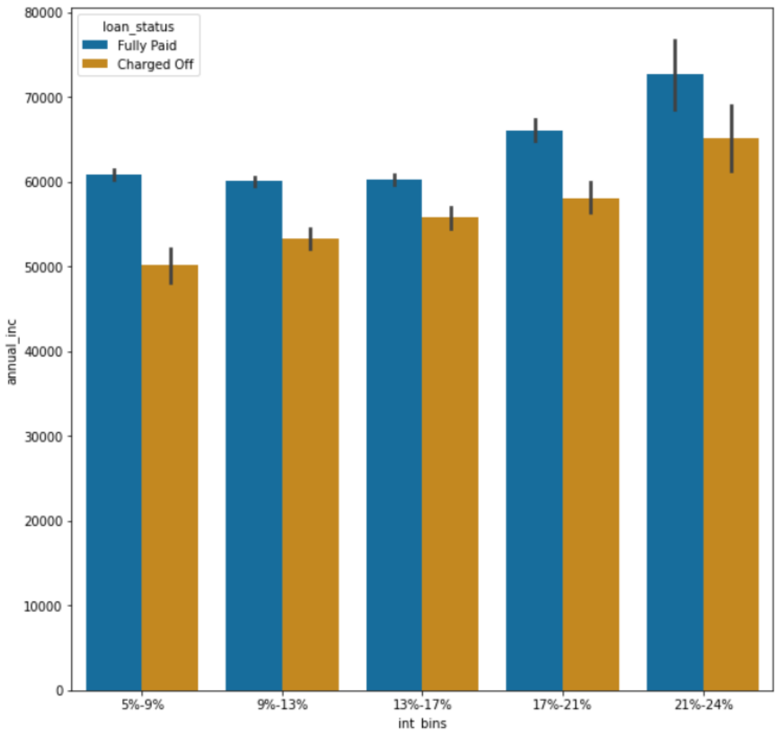
Applicants who have an interest rate of 21-24% and an annual income of 70-80k have more chances to default



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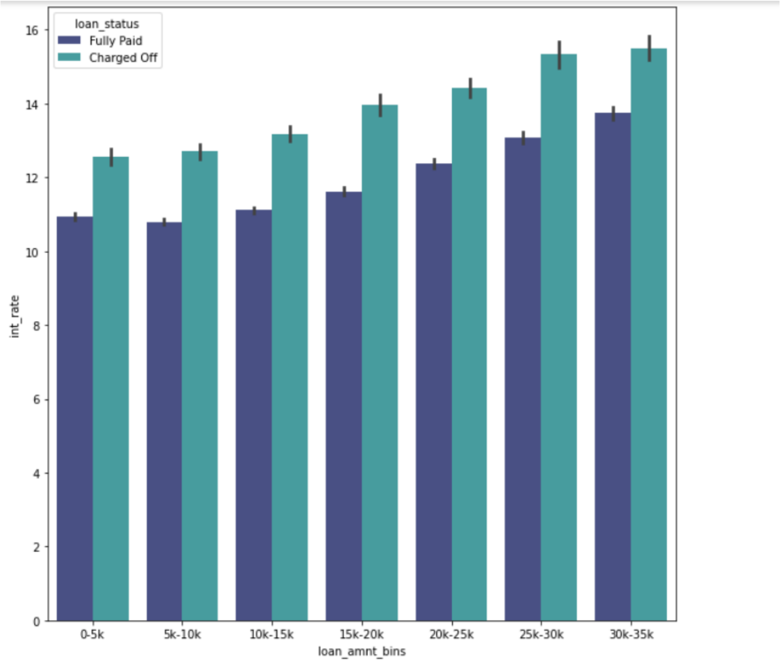
Applicants who have taken loans between 30k-40k and have an interest rate of 15-17.5% are more prone to default



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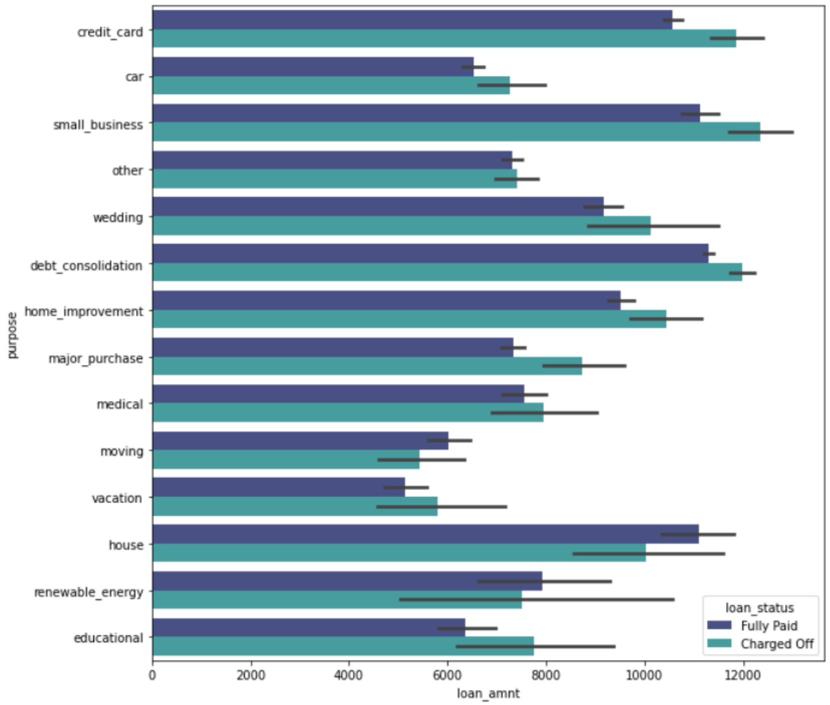
Applicants who have taken loan for small business and the loan amount is greater than 14k are prone to default



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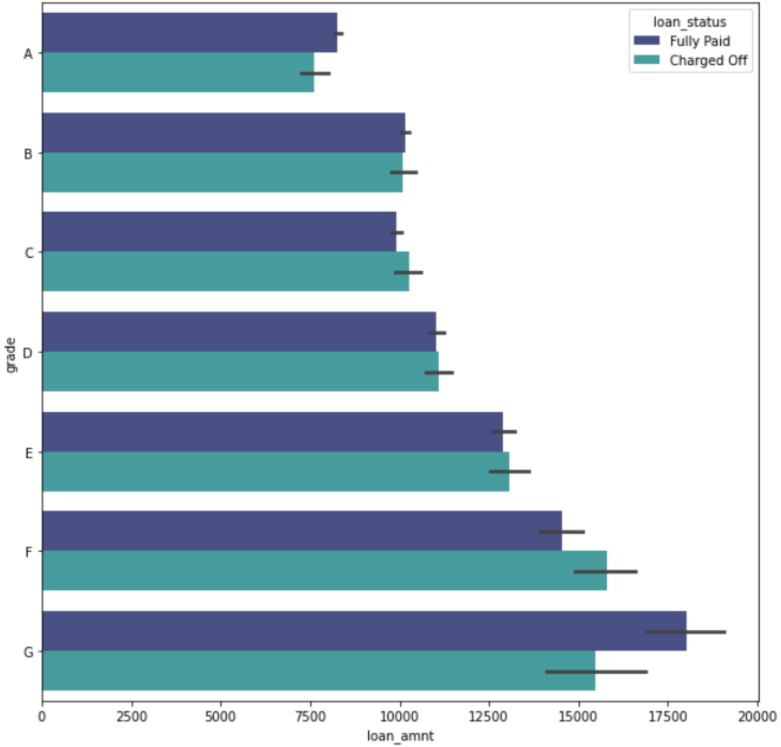
Applicants with loan grade F and loan amount between 15k-20k are more prone to default



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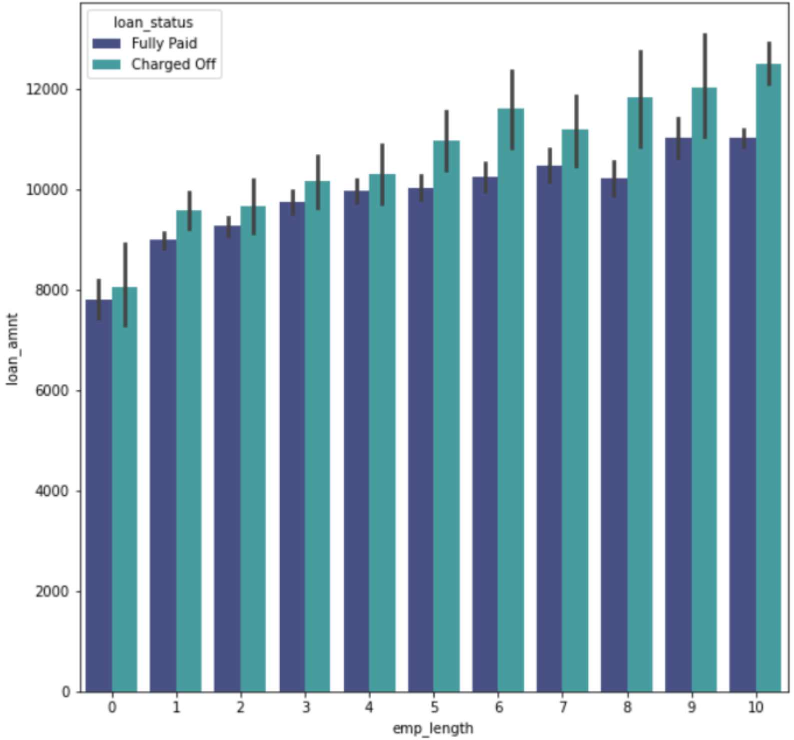
Applicants with 10 years of employment length and loan amount between 12k-14k are more prone to default



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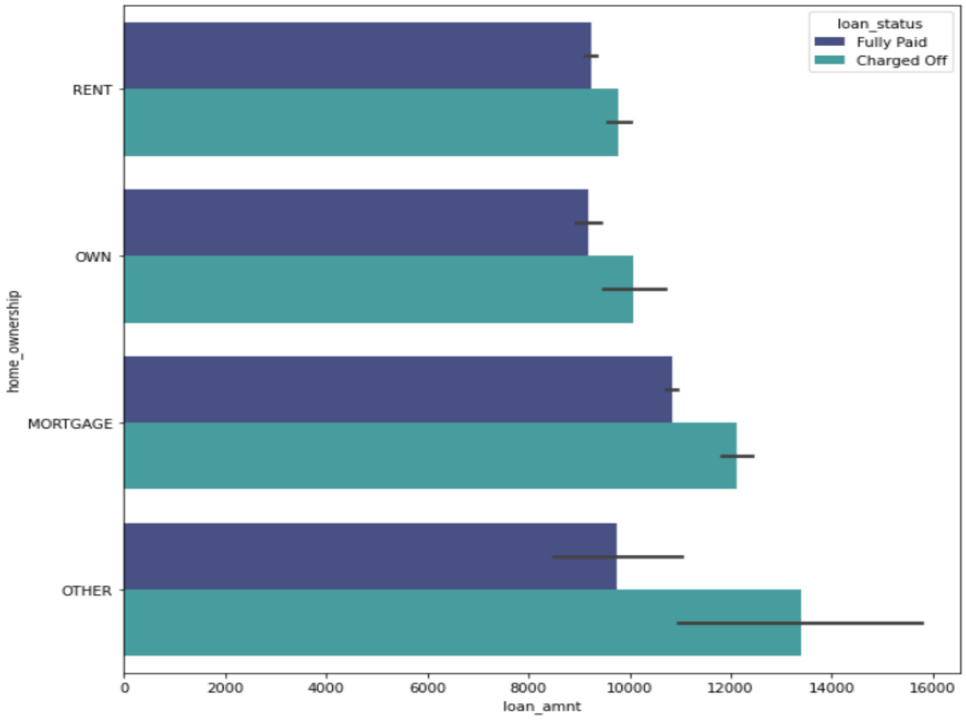
Applicants with Mortgage home and have a loan amount of 12k are more prone to default



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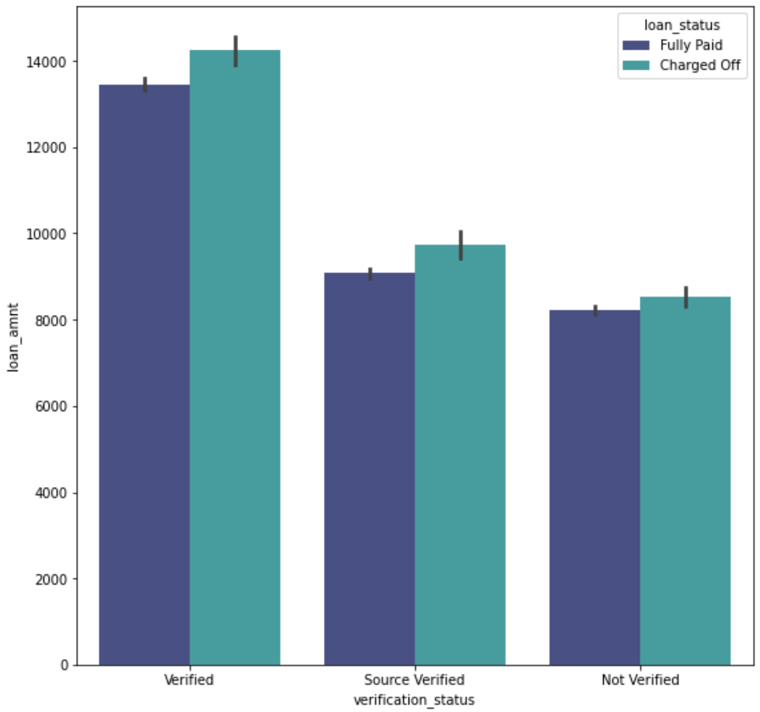
Applicants whose income is verified and whose loan amount is above 14k are prone to default



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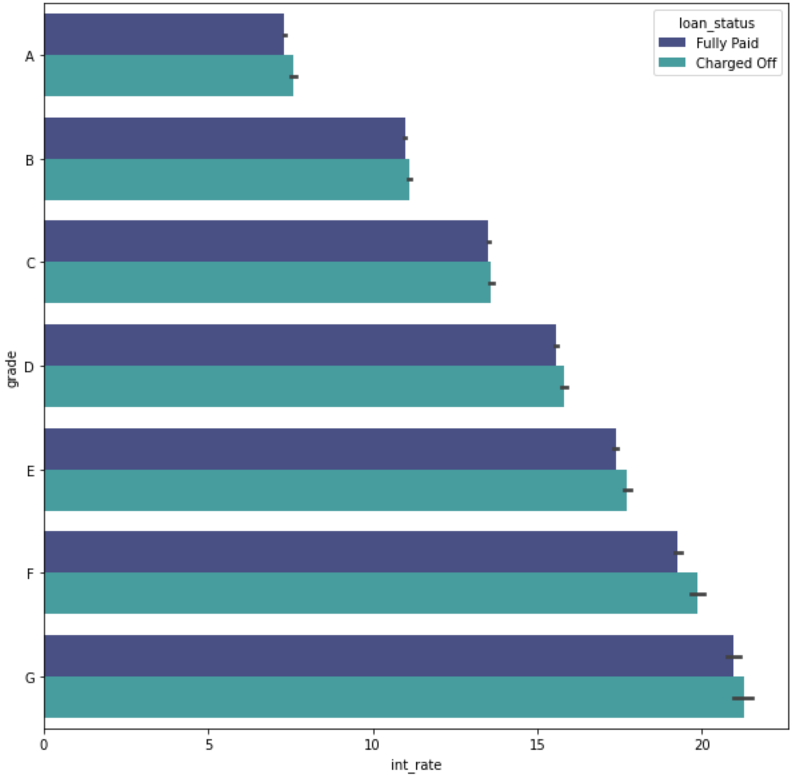
Applicants with loan grade G and interest rate above 20% are prone to default



Thank You!