

Lending Club Case Study Assignment

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Background and Objectives

Background:

- Lending Club is a peer-to-peer marketplace, which connects lenders and borrowers online. Borrowers apply via online platform and are assigned an internal grade, based on which interest rates are decided.
- Lenders can then decide on whether to lend based on the loan attributes including interest rates.
- The idea is to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss.

Objective:

- Leveraging EDA (Exploratory Data Analysis), identify additional fields for understanding the consumer and loan attributes that influence the loan default status.

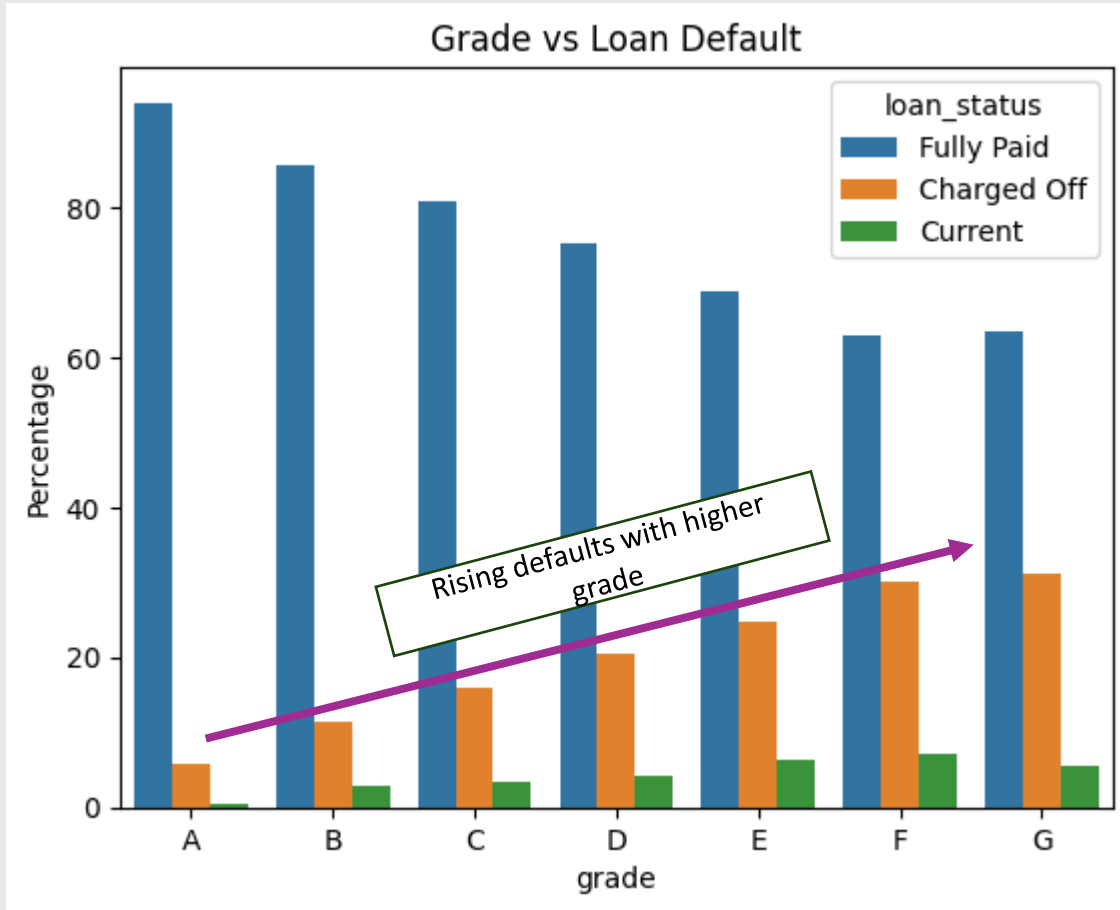


Analysis

Key fields where the impact on Loan
Default Status is highest

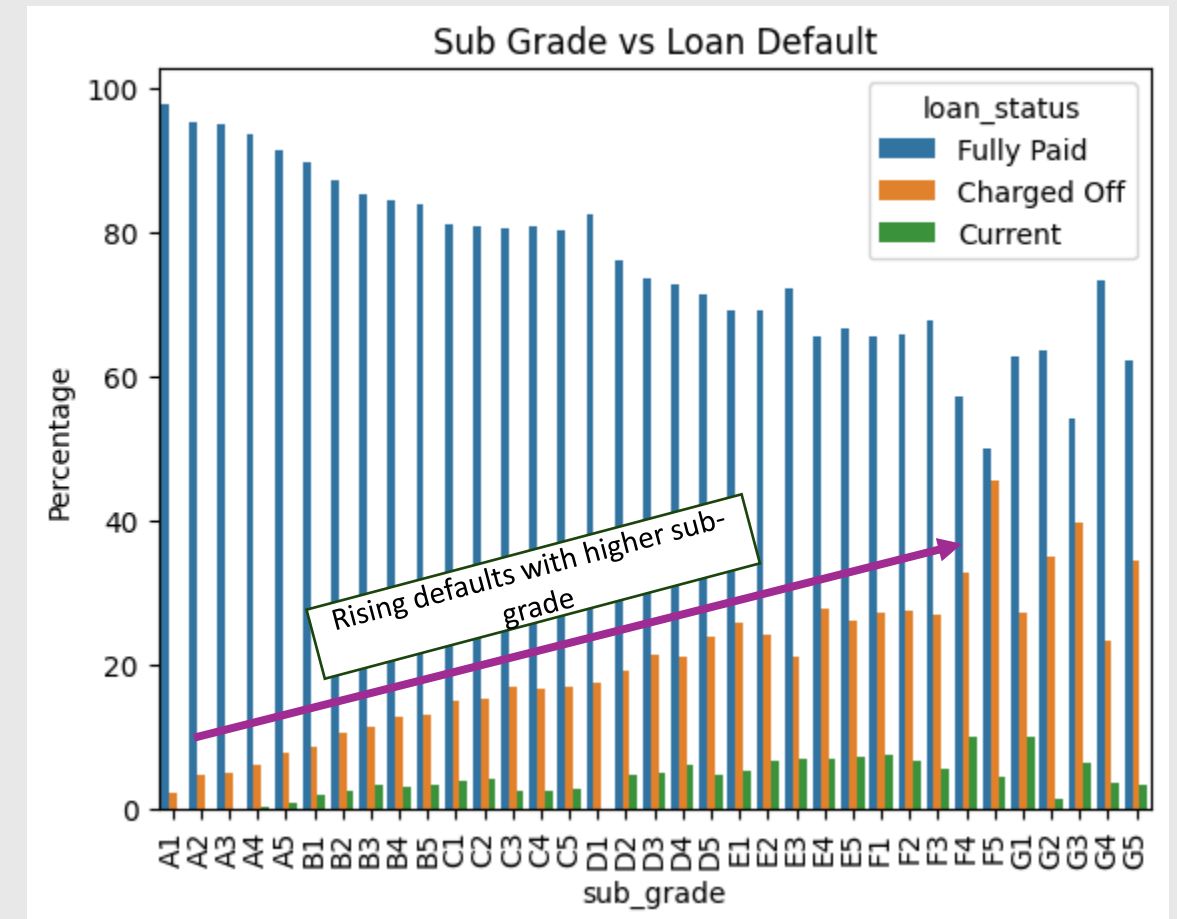


Impact of Grade & Sub-Grade on Loan Default

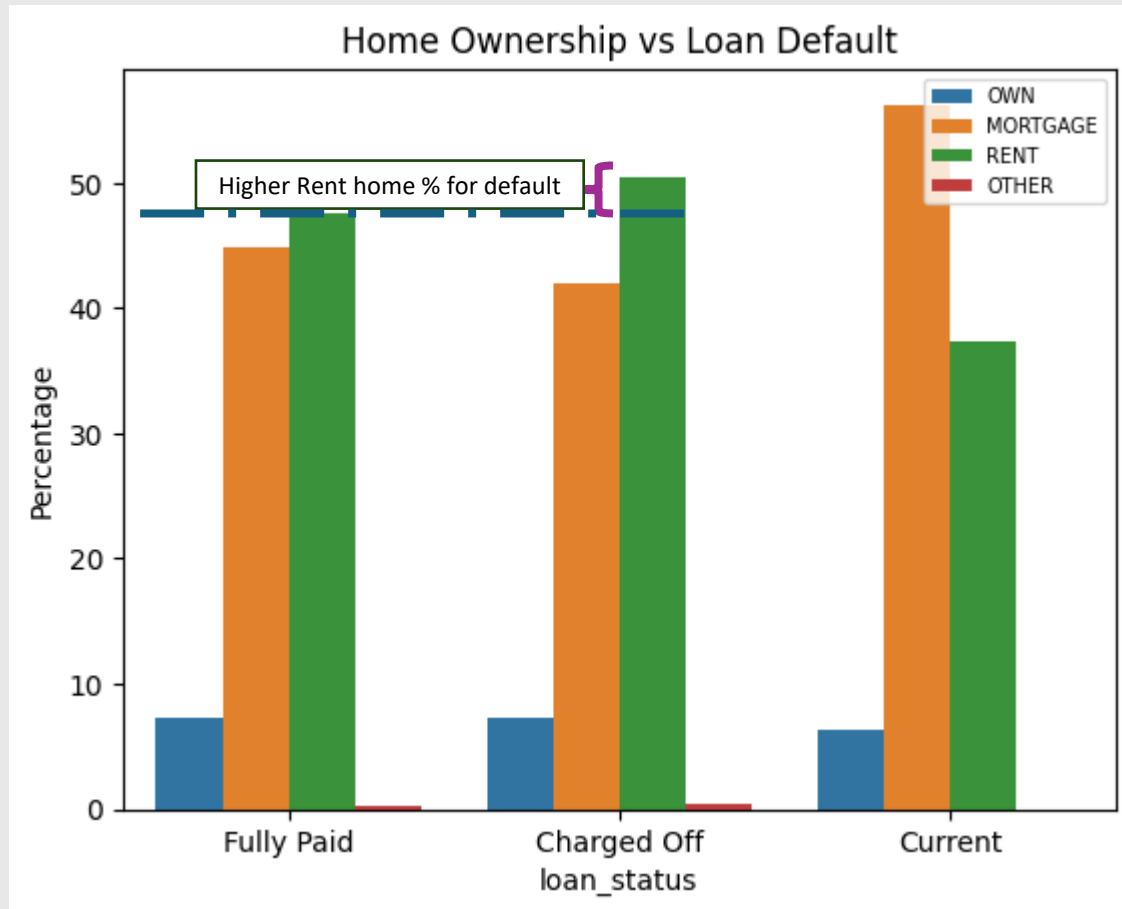


Interpretation:

- Grade and sub_grade: reflects LC assigned loan grade and sub grade
- As we can see, that the with grade and sub-grade increase the charged off % (loan default) is increasing
- So exiting system of grading is aligned to finding loan defaults, but can be improved

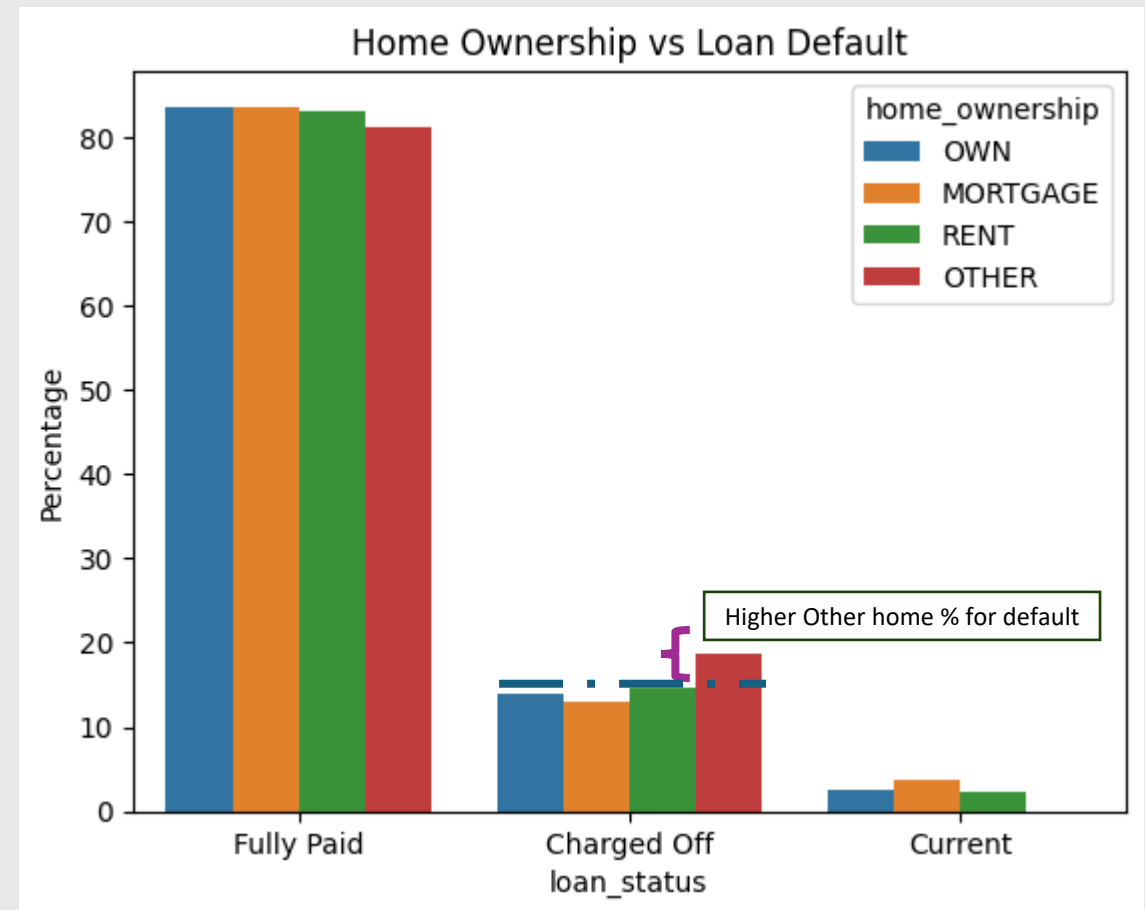


Impact of Home Ownership on Loan Default

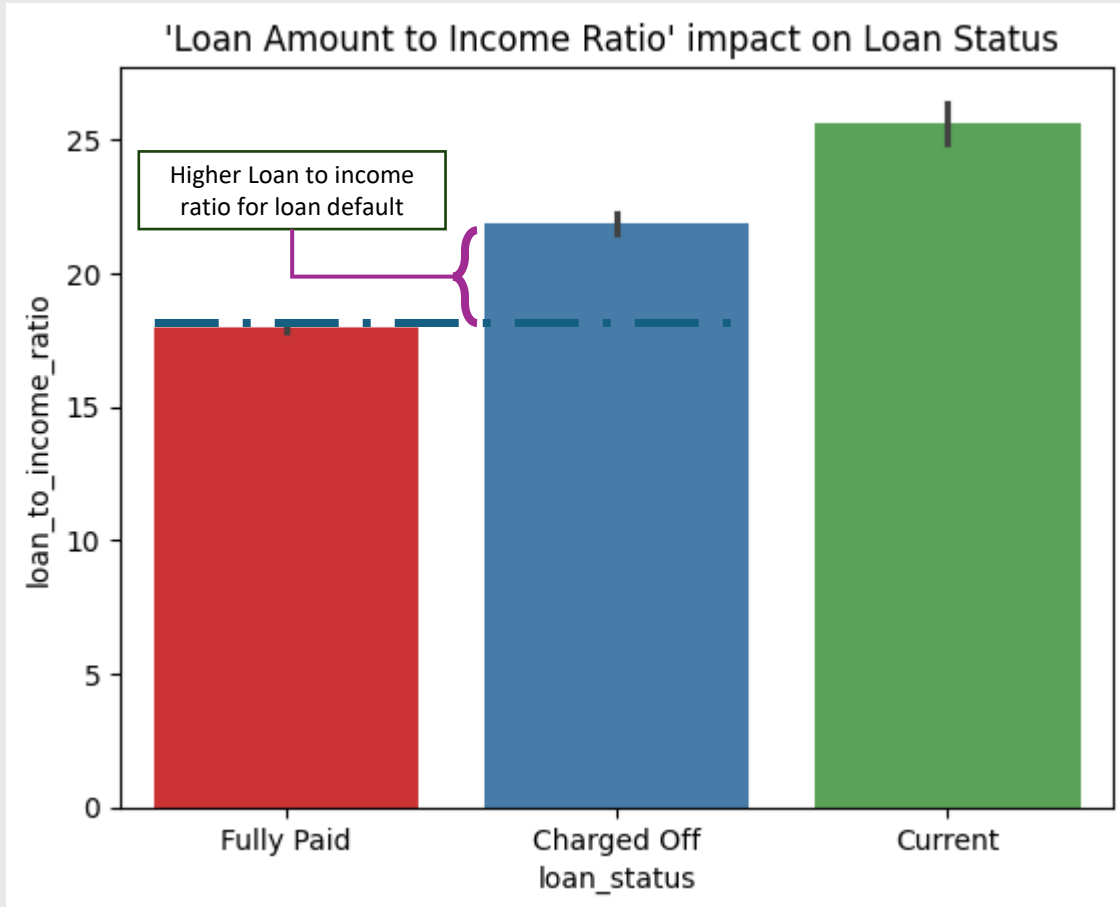


Interpretation:

- home_ownership field: reflects the type of home than the applicant has (owned, rented, mortgaged, others).
- This has some bearing to the Charged Off (Default) status where we see that **rental home application have a higher % in charged off (loan defaults)**
- Also, we notice that “Other” (which were the rows with empty value) have a high possibility of default



Impact of Loan Amount to Income Ratio and Revolving balance to income ratio

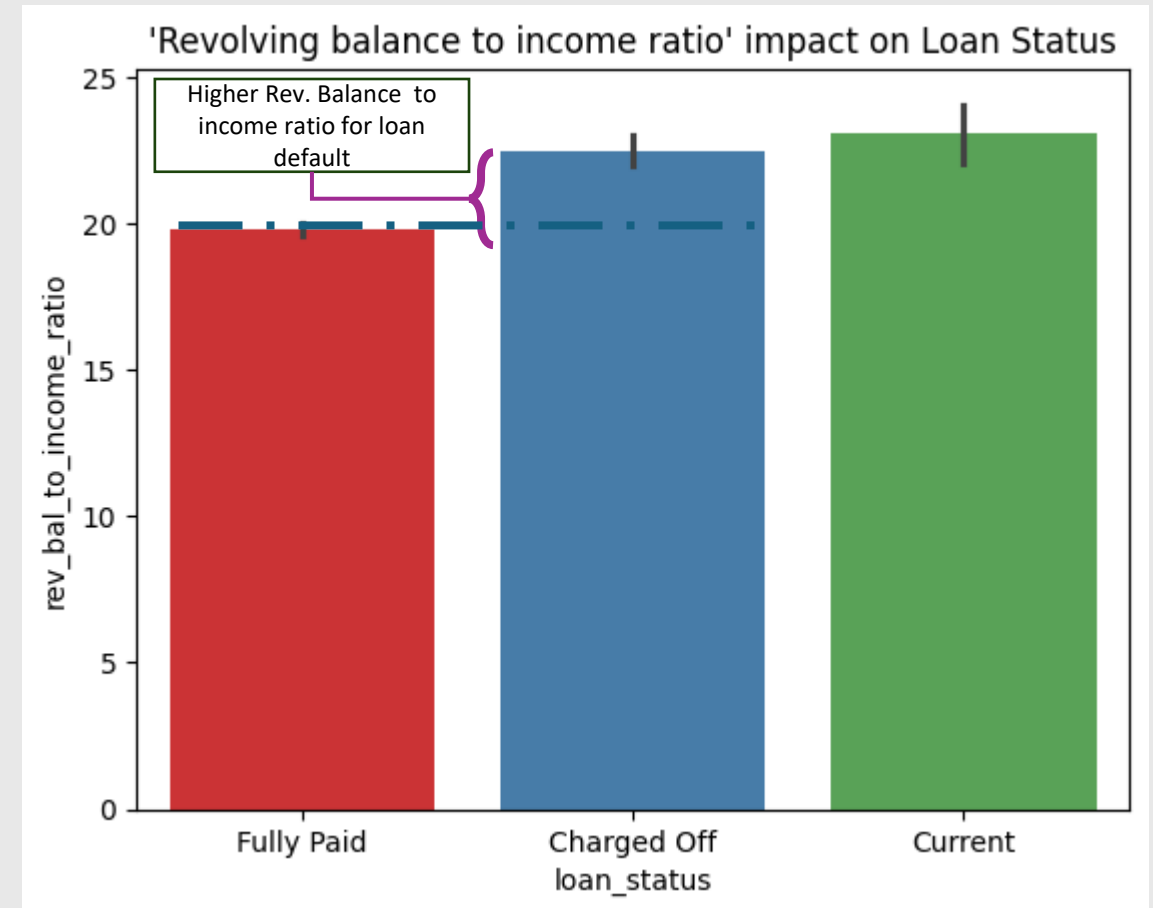


Interpretation:

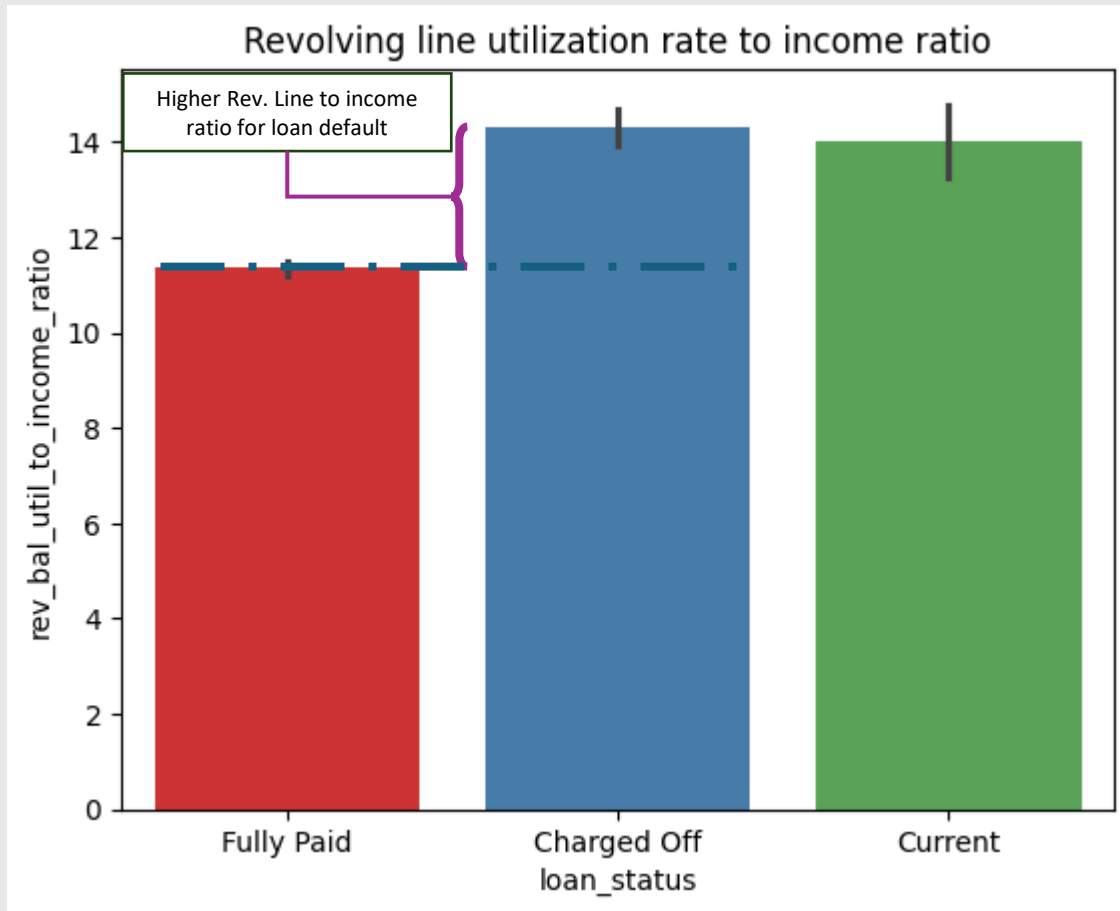
- Loan Amount to Income Ratio field: Reflects on the ability of the person to pay the loan amount in relation to the income
- We see that **this field has a strong bearing on the application having a higher % in charged off (loan defaults).**

Interpretation:

- Revolving balance to income ratio field: reflects on the ability of the person to pay the loan consider the "Total credit revolving balance" in relation to the income.
- We observe that **this field has a higher % in charged off (loan defaults)**



Impact of Revolving line utilization rate to income ratio and State impact

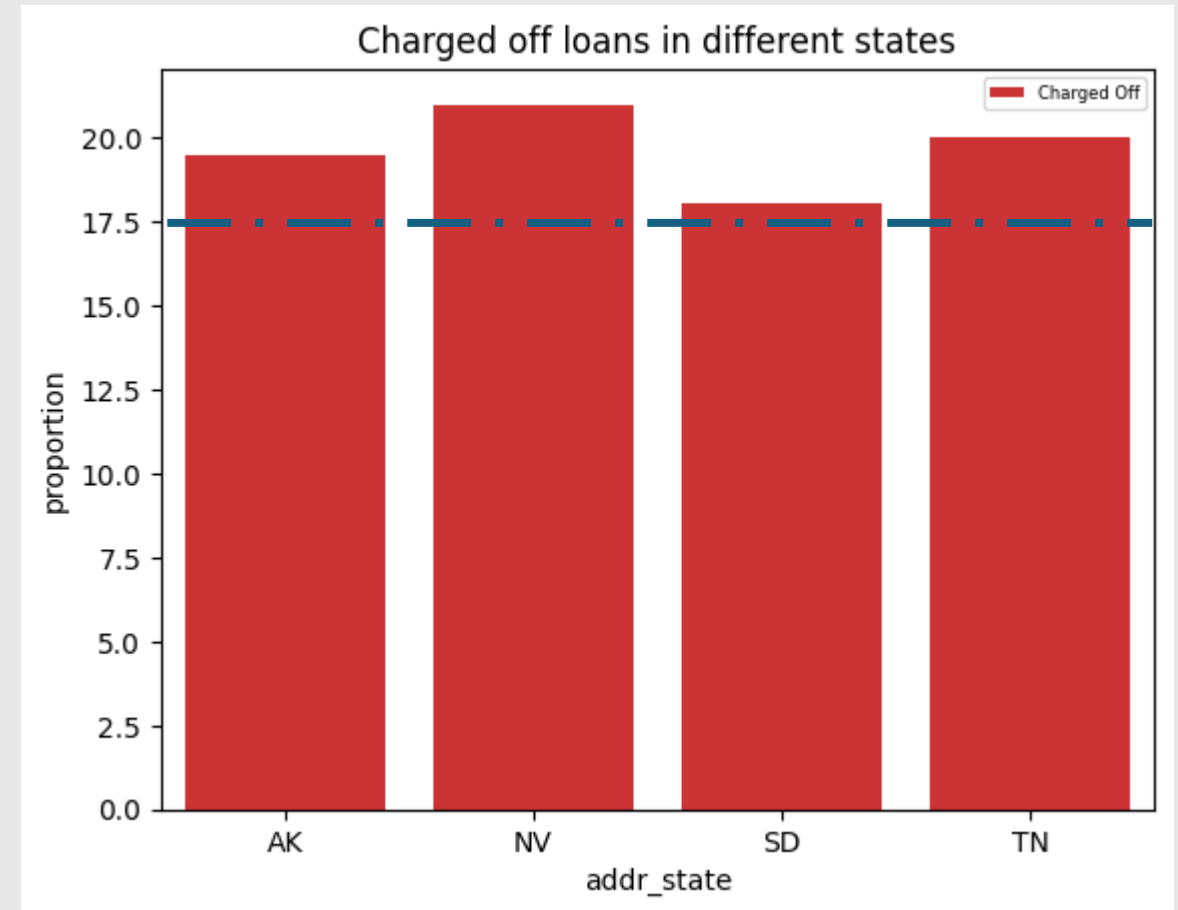


Interpretation:

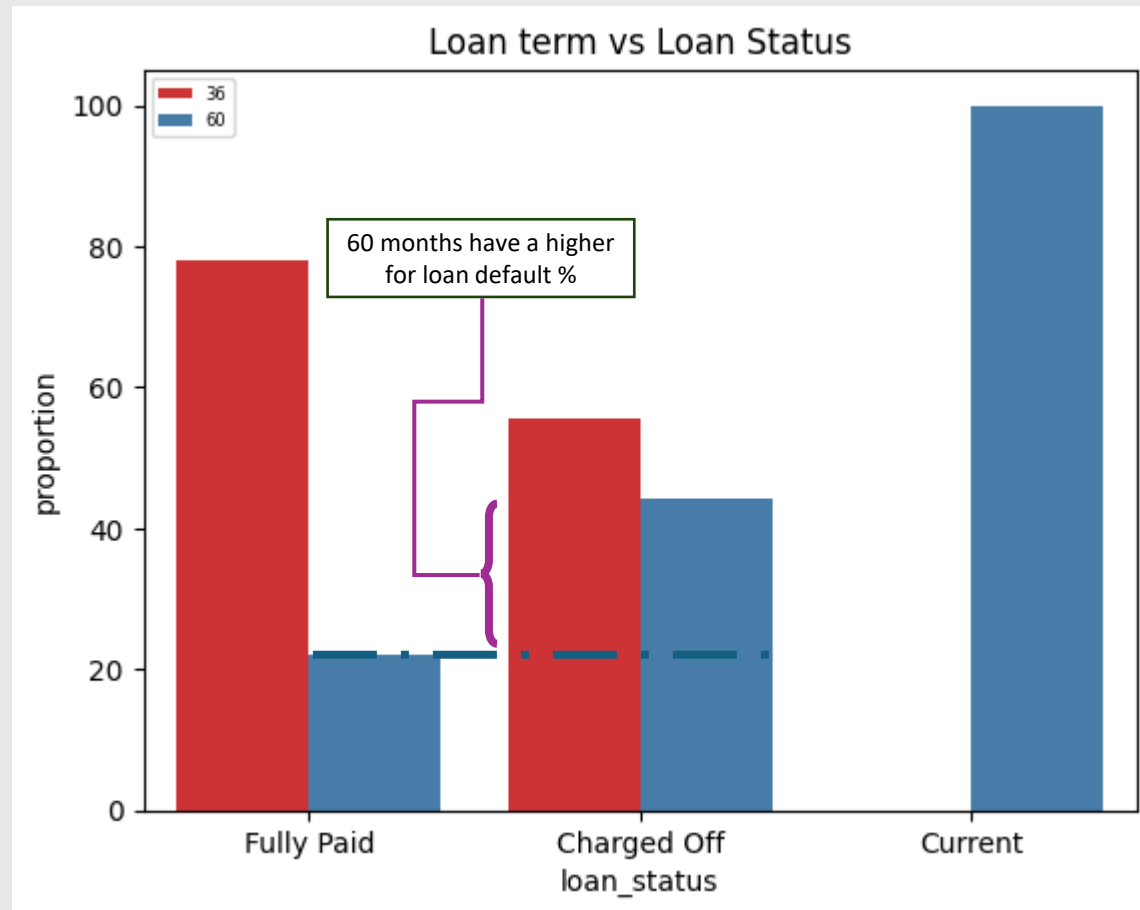
- Revolving line utilization rate to income ratio field: Reflects on the ability of the person to pay the loan consider the “Revolving line utilization rate” in relation to the balance and income.
- We see that **this field has a strong bearing on the application having a higher % in charged off (loan defaults).**

Interpretation:

- State field: Looks at the % of “charged off” across all states. The below reflect 4 states where the proportion of loan default is the highest.
- We observe that **AK, NV, SD and TN, the loan defaults is highest.**



Impact of Loan Term and Publicly available bankruptcies on Loan Default

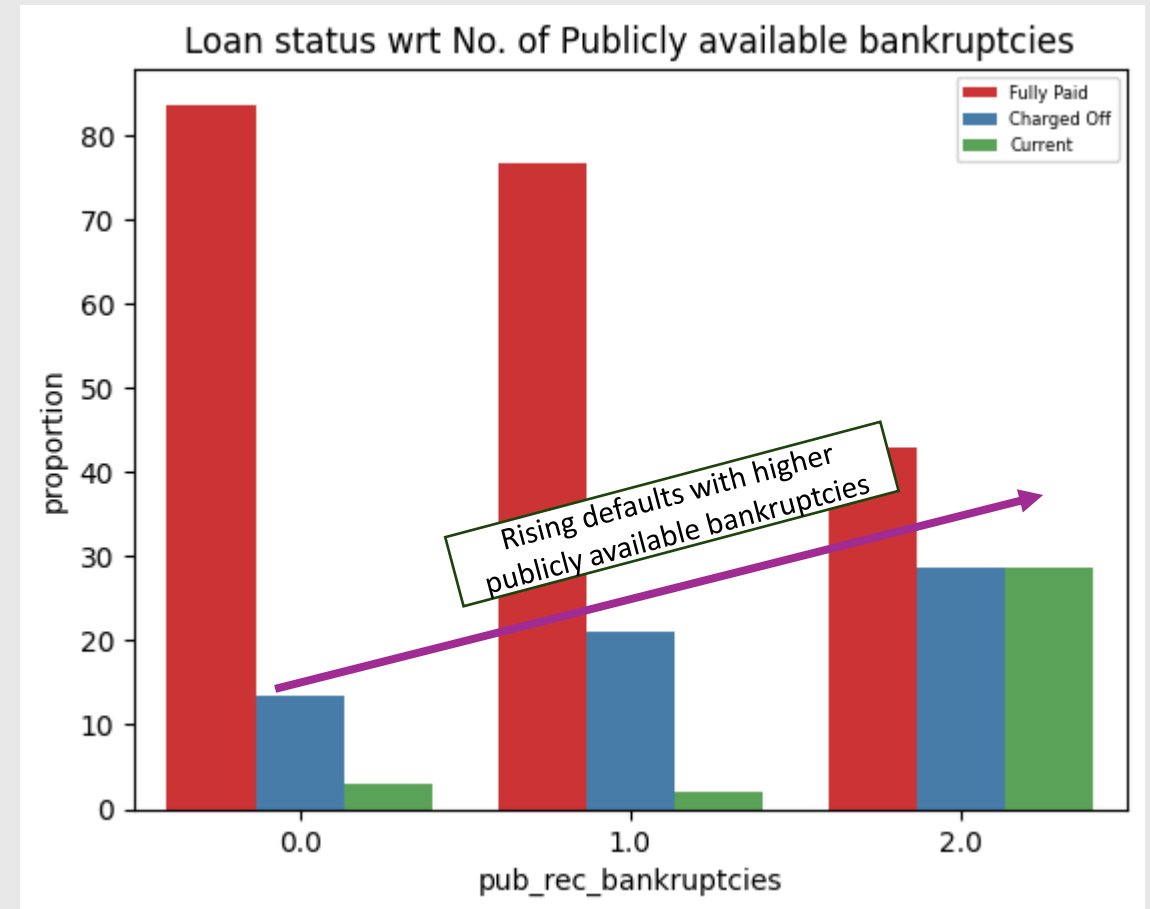


Interpretation:

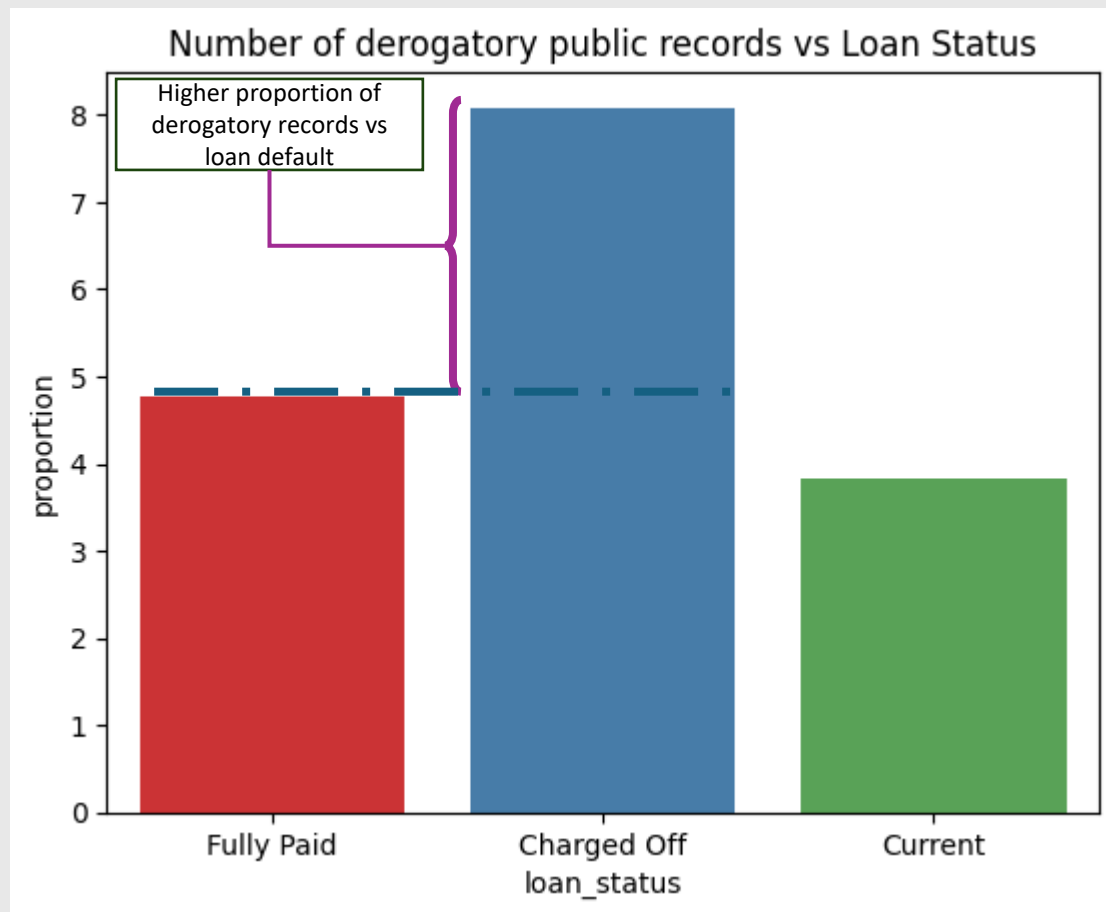
- Loan Term field: Reflects the duration of the loan
- Logically, longer it is, the probability of the loan default increases. We can observe that 36 months has a lower % of defaults (Charged Off Status). 60 months has a higher likelihood of loan default

Interpretation:

- Revolving balance to income ratio field: This field is publicly available bankruptcies details of the loan applicant
- We observe that this field has a higher % in charged off (loan defaults). Meaning as the public records are increase the loan default is increasing.



Impact of Derogatory public records and Inquiries in the last 6 months

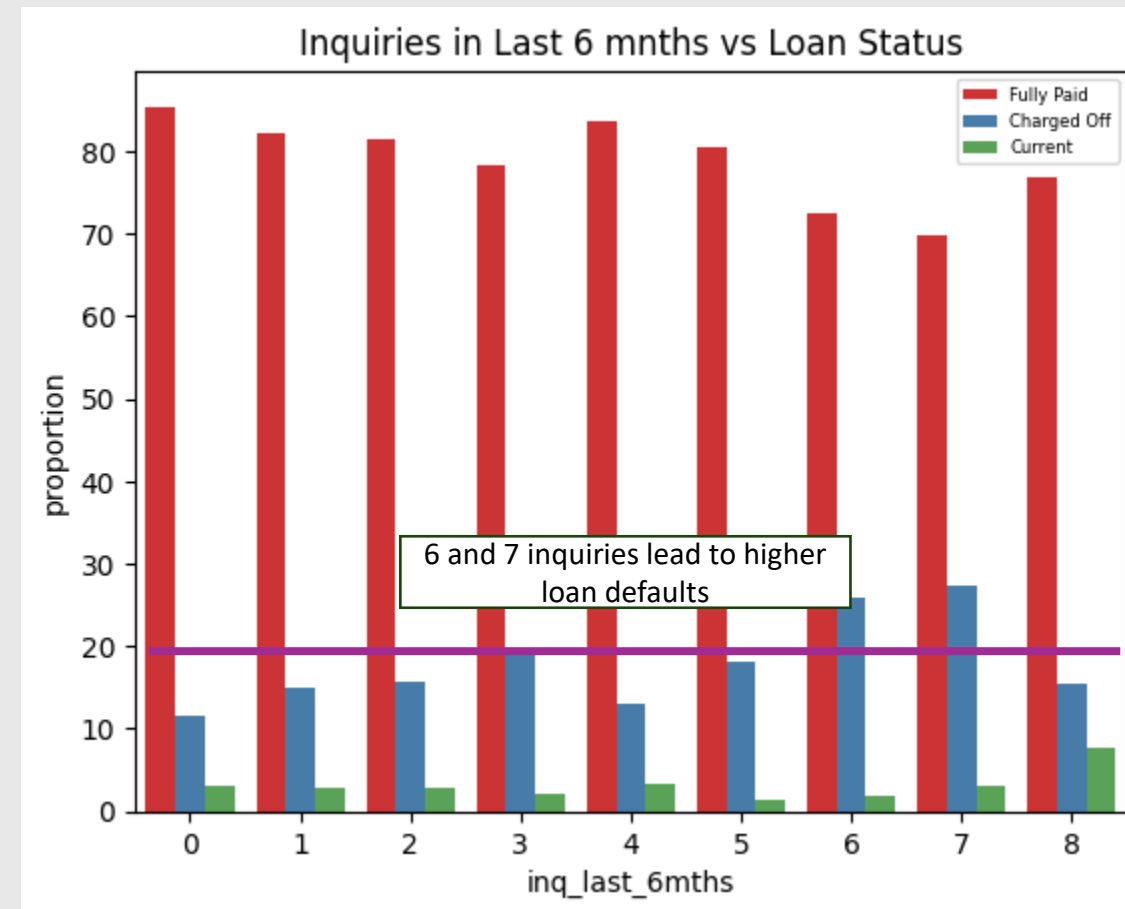


Interpretation:

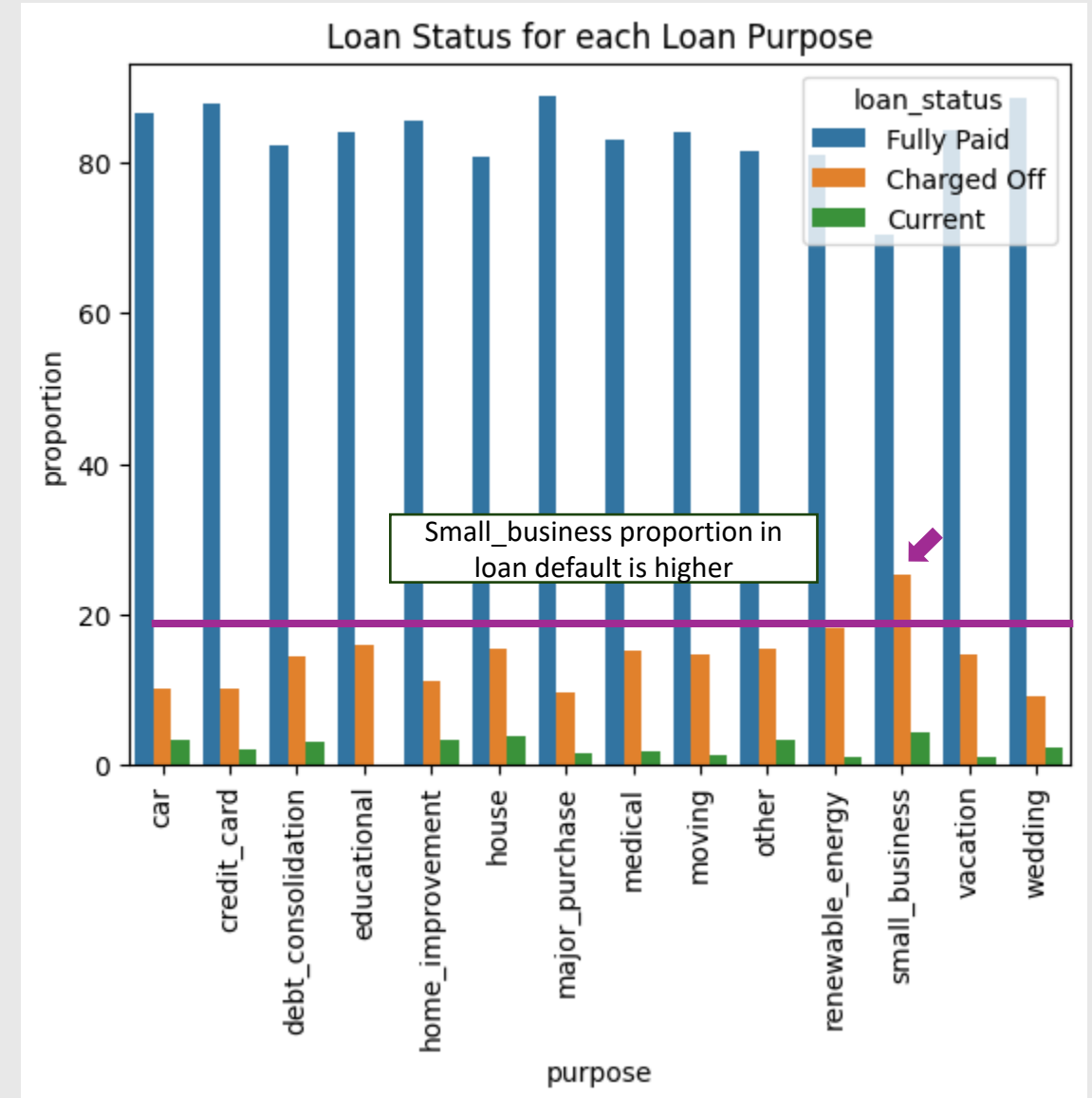
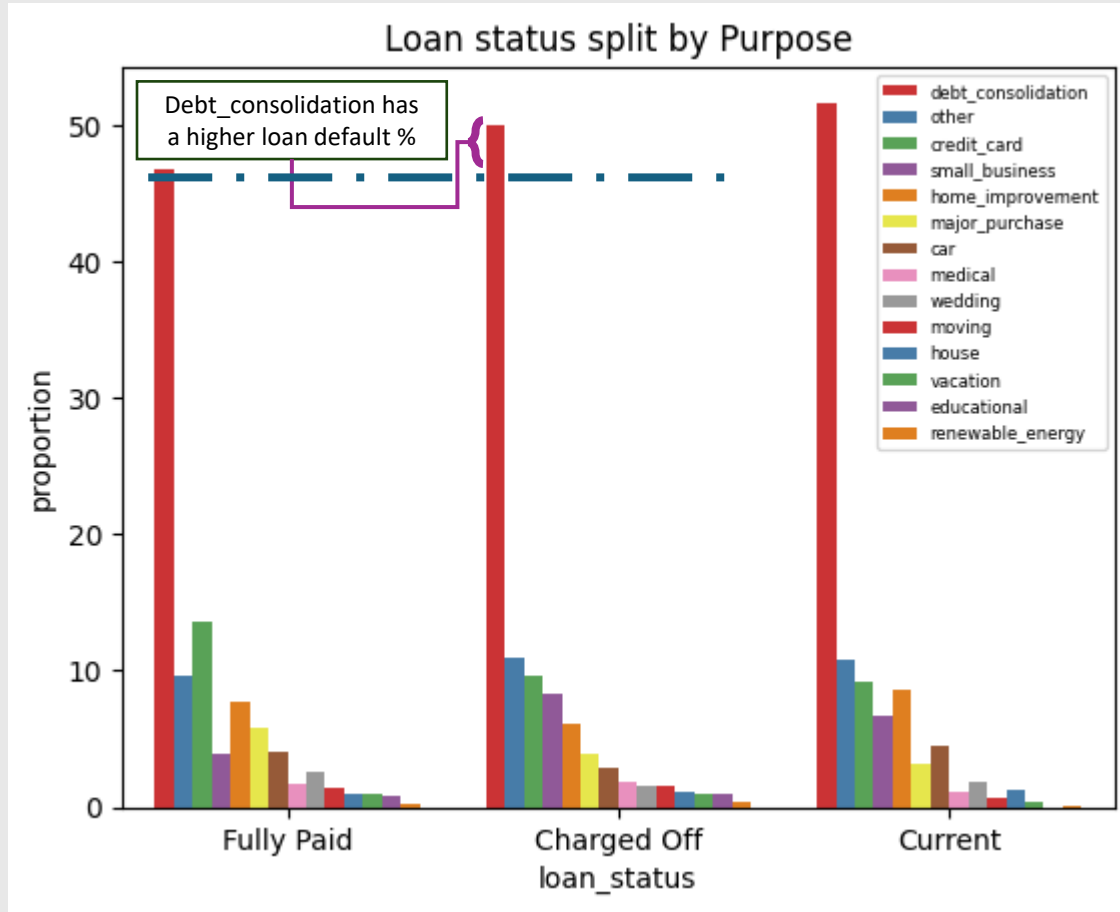
- pub_rec field: The number of Number of derogatory public records
- This higher proportion of this field means that loan default % is higher

Interpretation:

- inq_last_6mths field: This field is the number of inquiries made by applicant in past 6 month
- We observe that this field has a higher % in charged off (loan defaults) especially after 5 enquiries.



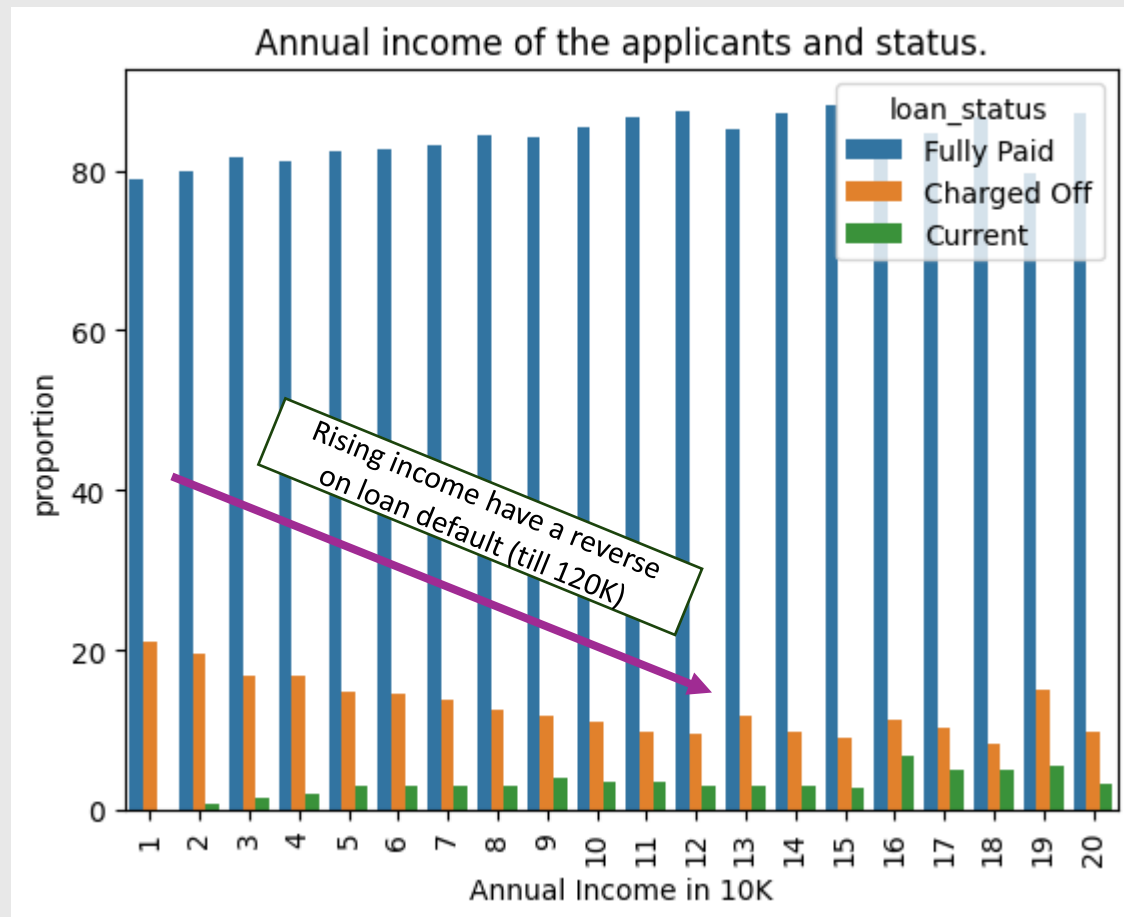
Impact of Purpose on Loan Default



Interpretation:

- Purpose field: This shows the purpose for which the loan was taken
- Debt consolidation is a high % of the Charged Off Status. Meaning if the purpose is Debt Consolidation, it has a higher default probability.
- In the right-hand graph, we observe that 'small_business' has a higher % of the Loan Defaults. This means that this category is to be flagged.

Impact of Annual Income and Open Credit Line in the last 6 months

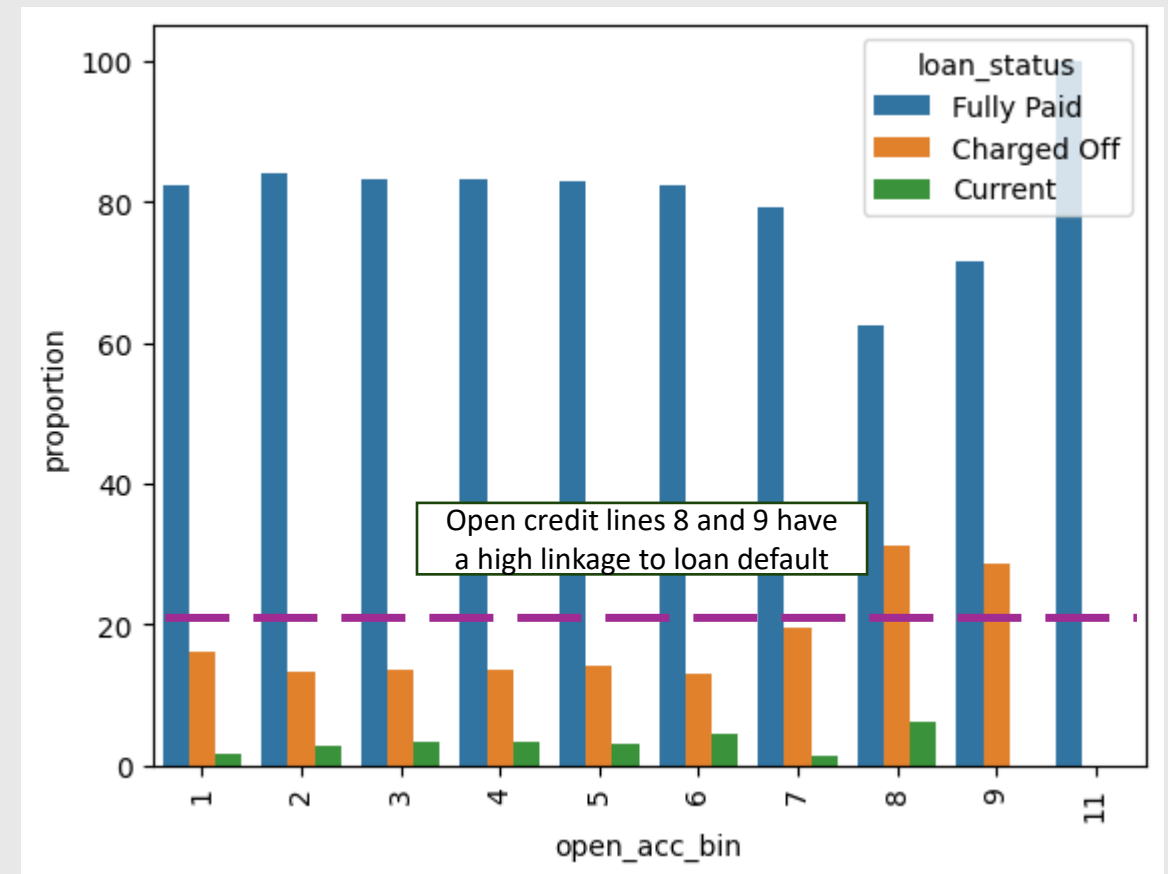


Interpretation:

- Annual Income field: The number of Annual Income of the applicant
- Observation is that loan defaults are decreasing with higher income till 120K i.e. default is Higher at lower income

Interpretation:

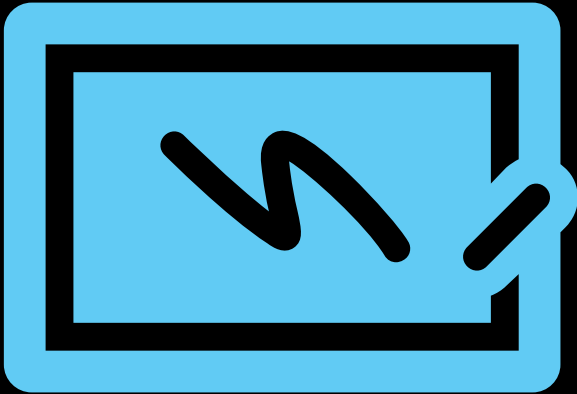
- Open Credit Line field: This field is the number of open credit lines in the borrower's credit file.
- We observe that after 7 open credit lines the default % rises sharply.





Recommendations

- Key Recommendations based on the above analysis



Recommendations: Consider the below additional parameters

- ✍ **Existing grading system** that the company is aligned to an extend to Loan Defaults. However, this can be **improved further**. So that the loan is either denied to based on additional criteria or the interest rate is increased in proportion to the risk.
- ✍ **Home ownership** has a clear bearing on the Loan Defaults with “**Rental**” home application have a higher % in charged off (loan defaults). Also, we notice that “**Other**” (which were the rows with empty value) have a high possibility of default
- ✍ Impact of “**Loan Amount to Income Ratio**”, “**Revolving balance to income ratio**” and “**Impact of Revolving line utilization rate**” on Loan default is very high. This need to be factored in while planning whether to give loans or interest rate charged.
- ✍ If the applicant is from **AK, NV, SD and TN states, the loan defaults is highest**. Hence the higher loan interest or higher rejection should be planned around that.
- ✍ Annual Income: Observation is that loan defaults are **decreasing with higher income** i.e., **defaults are Higher at lower income**
- ✍ Impact of Purpose on Loan Default:
 - ✍ Debt consolidation is a high % of the Charged Off Status. Meaning if **the purpose is Debt Consolidation, it has a higher default probability**.
 - ✍ We observe that ‘**small business**’ has a higher % of the Loan Defaults. This means that this category is to be flagged.
- ✍ Impact of Loan Term: Logically, longer it is, the probability of the loan default increases. We can observe that 36 months has a lower % of defaults (Charged Off Status). **60 months has a higher likeliness of loan default.**
- ✍ **Open Credit Line in the last 6 months, Publicly available bankruptcies on Loan Default, Impact of Derogatory public records and Inquiries in the last 6 months** have a high bearing on the loan default. We need to consider these parameters to either plan for lower grade or reject the application.



Presentation End

Thank you.