Lending Club Case Study

Sai Satwik Kuppili
Mallikarjuna Manne

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Problem Definition

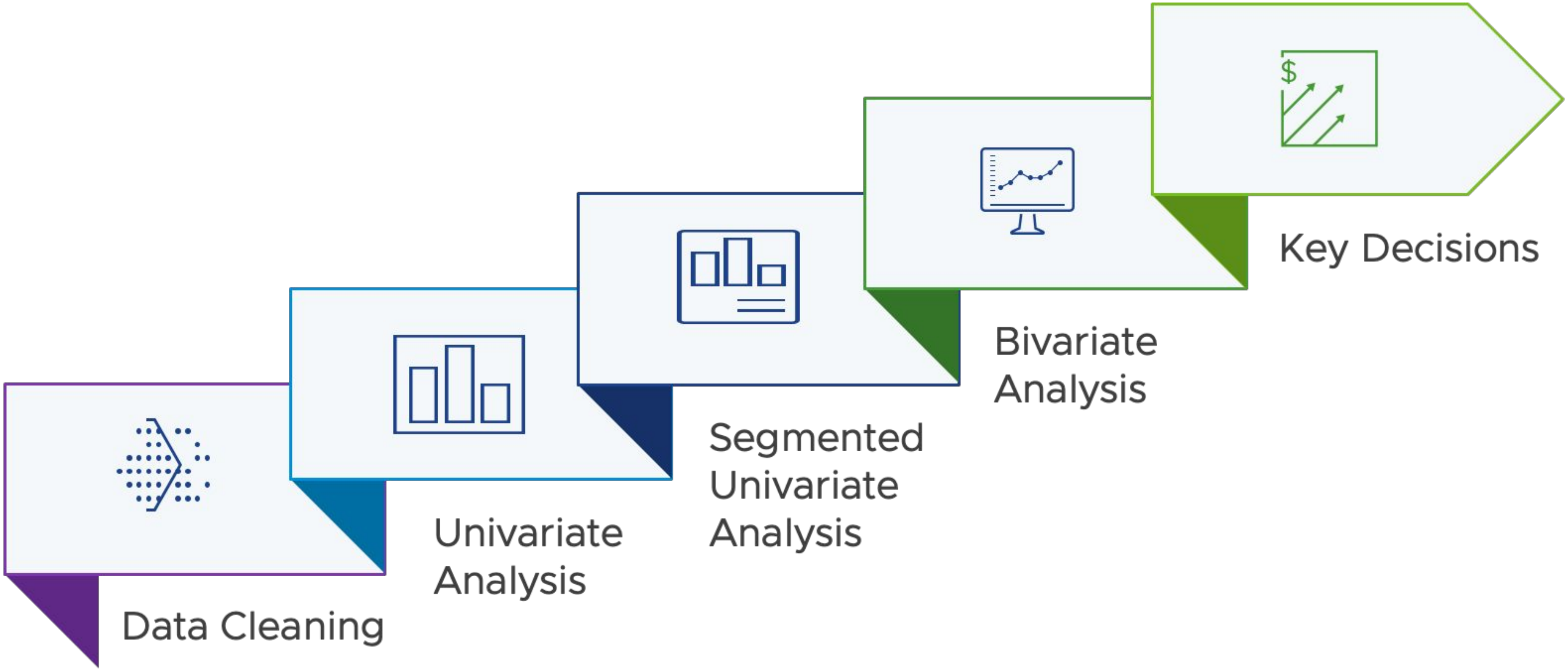
Lending Club want to understand the driving factors for loan defaults based on their previous loan data. These driving factors should be the strong indicators of default.

At the end, company would use our recommendations to reduce the risk of default.

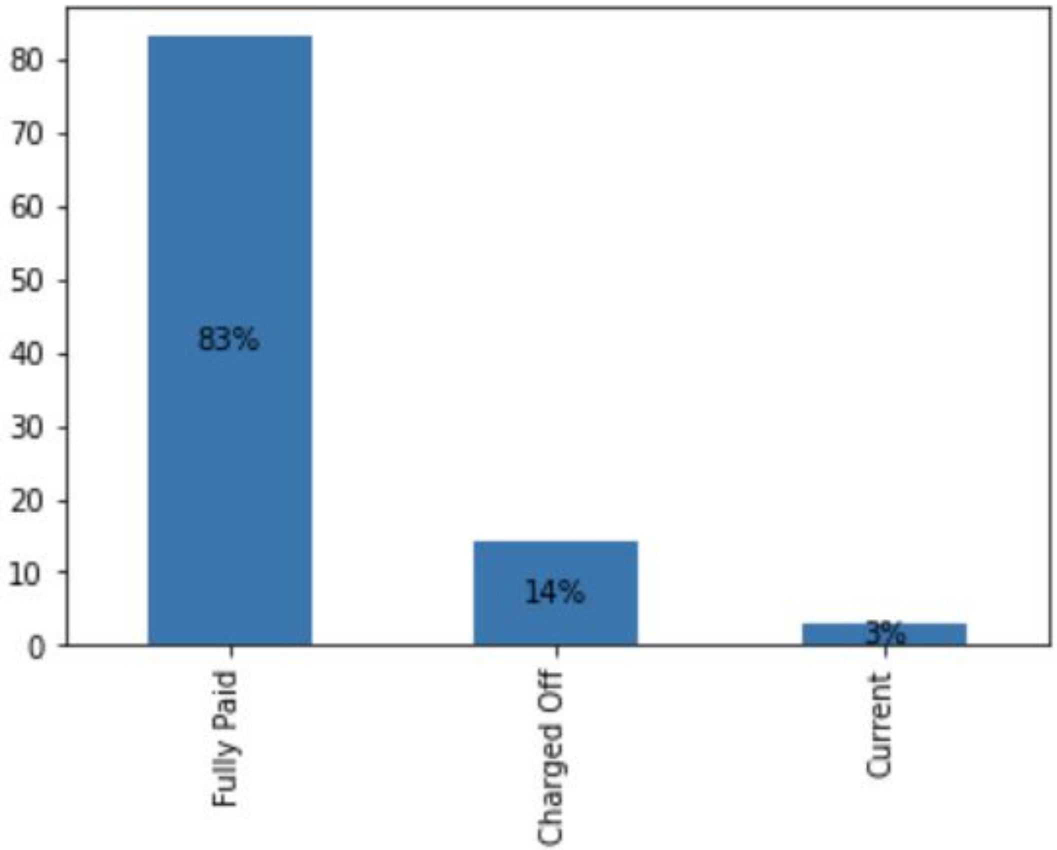
Goal:

The goal is to identify patterns from past dataset which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, lending (to risky applicants) at a higher interest rate, etc.

Analysis Steps

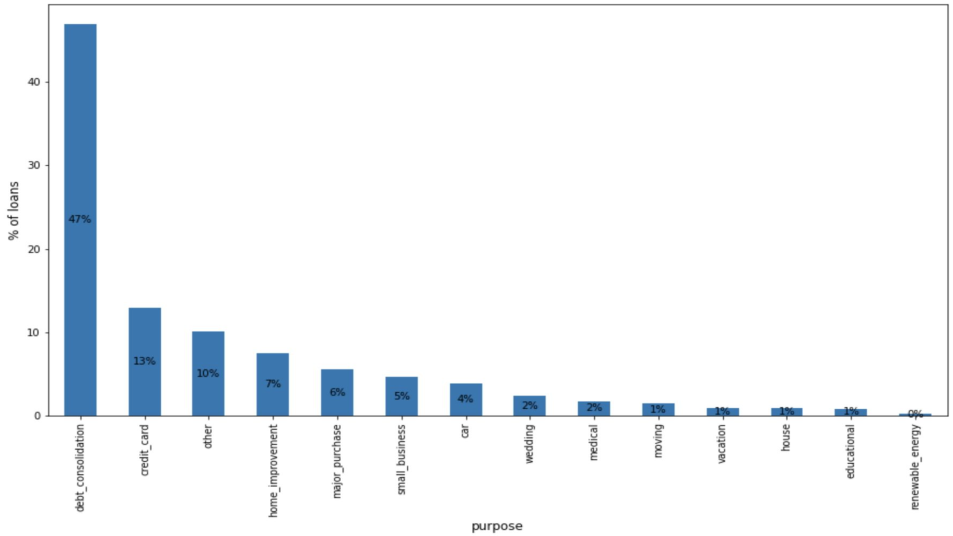


Analysis on Loan status

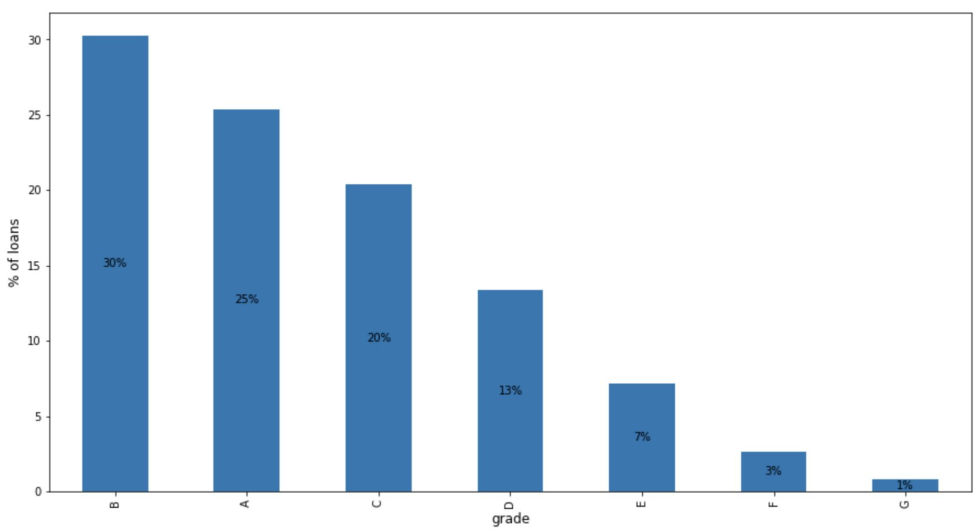


Approximately 14% of loans are defaulted in the given data

Analysis on Data Understanding

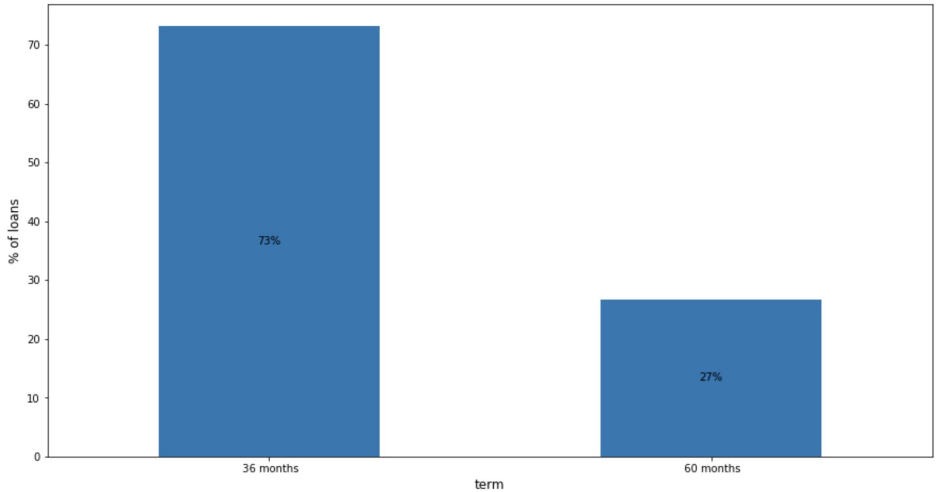


Maximum number of loans are for debt_consolidation followed by creadit_card

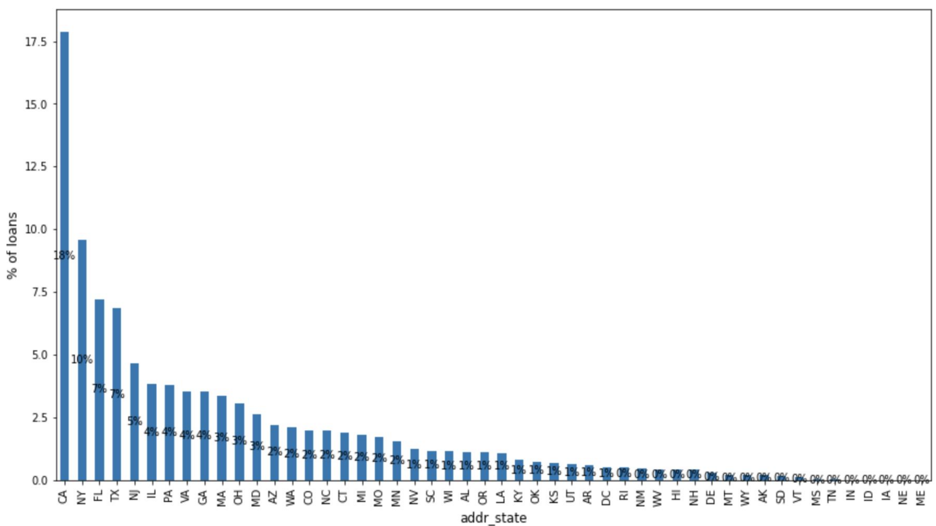


Maximum number of loans are with grade of A and B

Analysis on data Understanding cont..

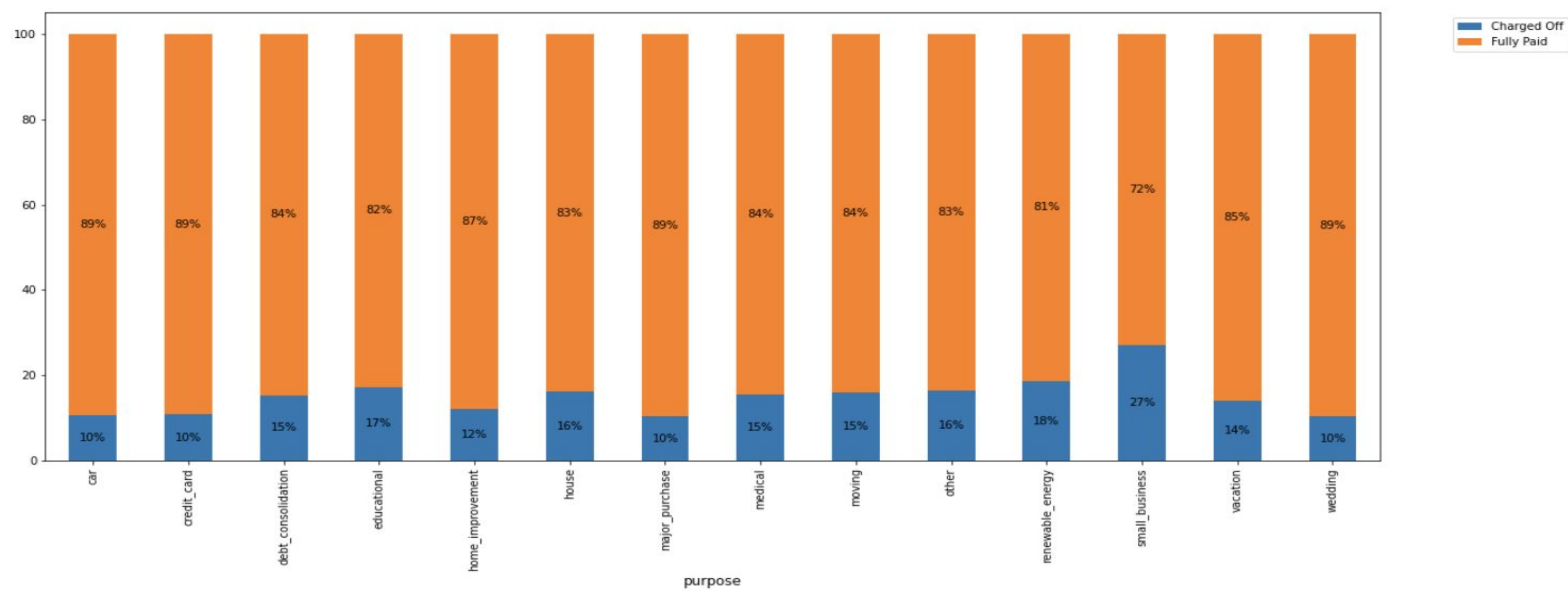


Maximum number of loans are granted for a term of 3 years



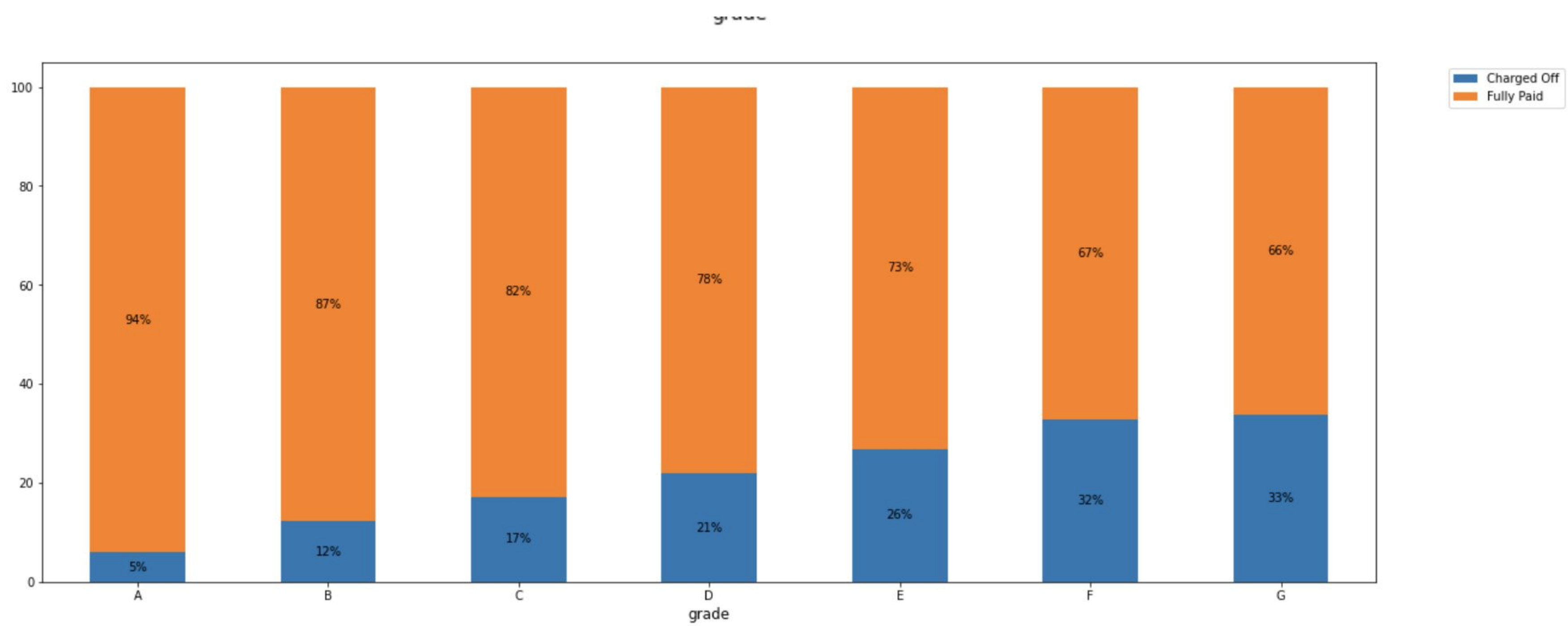
Maximum number of loans are issued in coastal and most populous cities like CA, NY, FL and TX.

Analysis on defaults by loan purpose



Around 25% of loans taken for small business has been charged off

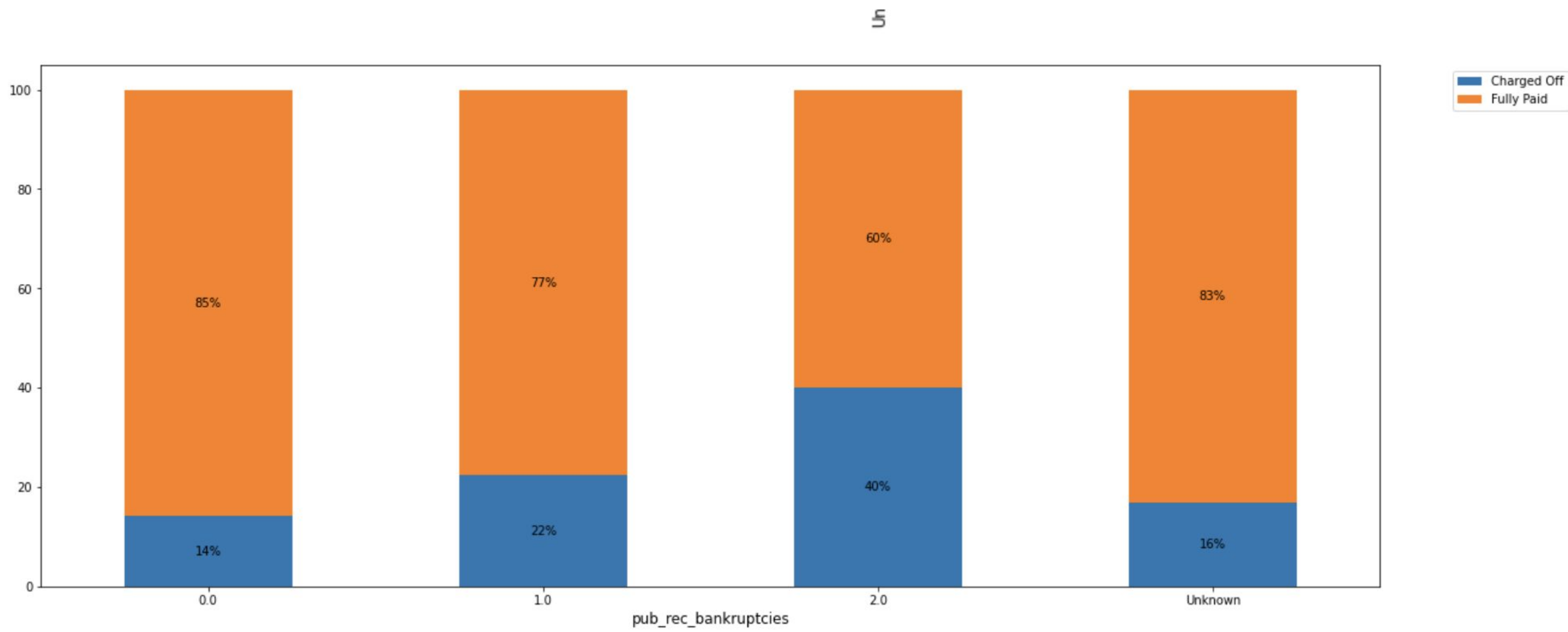
Analysis on defaults by grade



Grade A and Grade B looks safe. Even though the percentage of applicants from grades A and B are higher, charge off percentage is low.

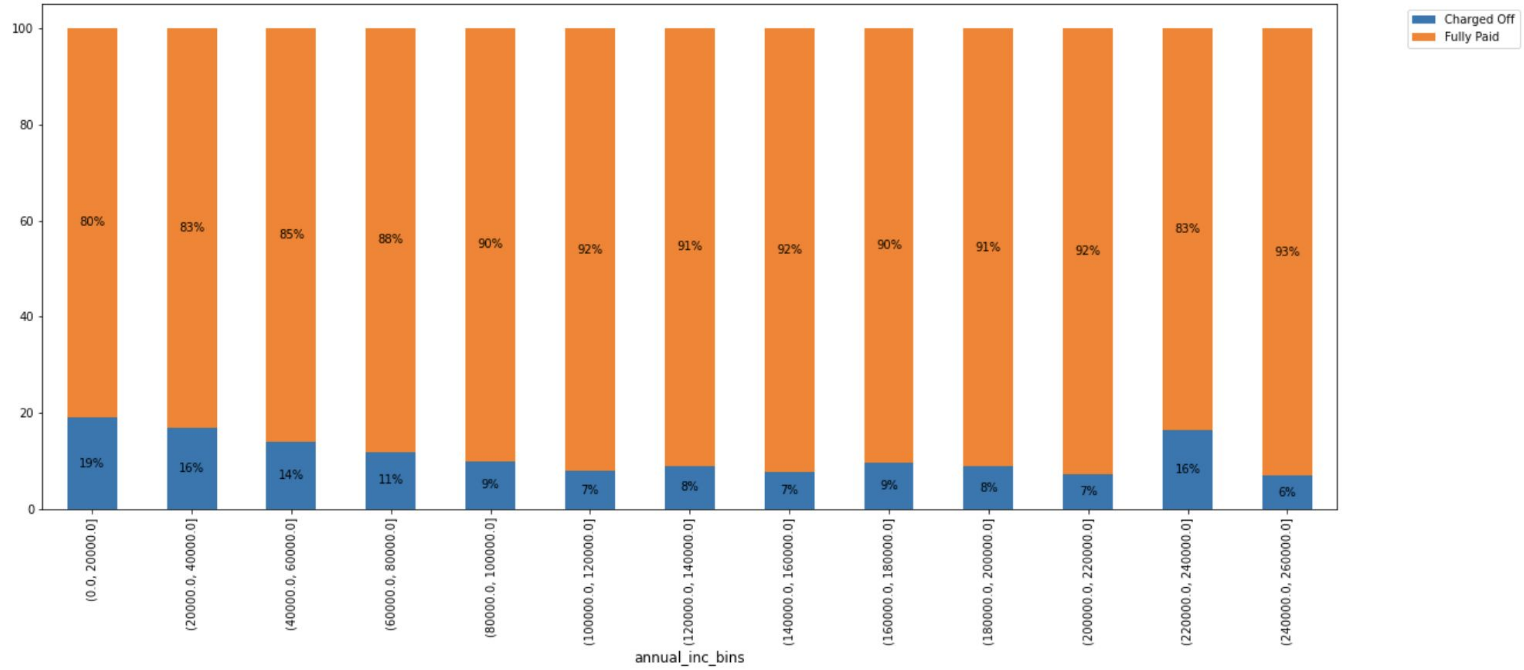
Almost 33% of loans of Grade F and Grade G are default and less in number as well. Loans falling under these grades seems very risky.

Analysis on defaults by prior records



Default percentage increases with increase in bankruptcies records. It is always preferable to avoid issuing loans with applicants having bankruptcies.

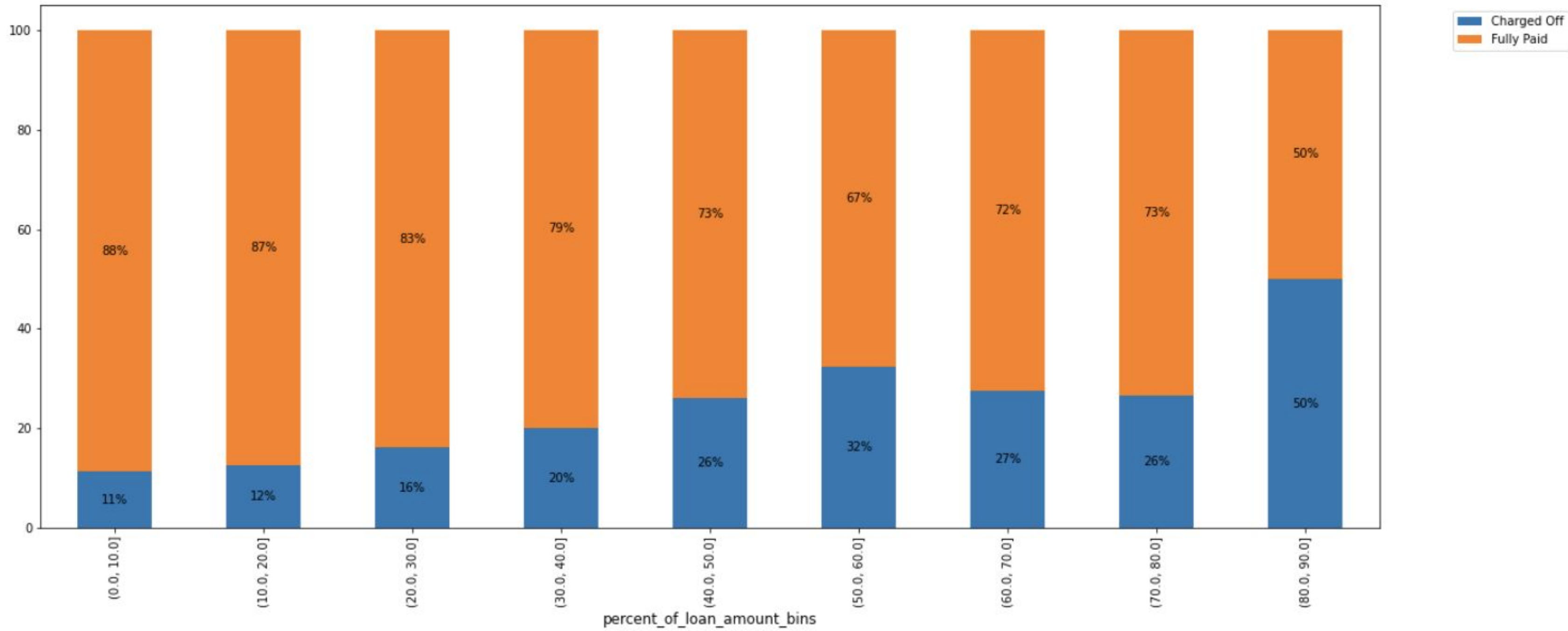
Analysis on defaults by annual income



Default rate is decreasing with increase in annual income. There is an anomaly at 2.2L to 2.4L bin because of less number of applicants from this category.

Ratio of loan amount to annual income will play an important role in default percentage.

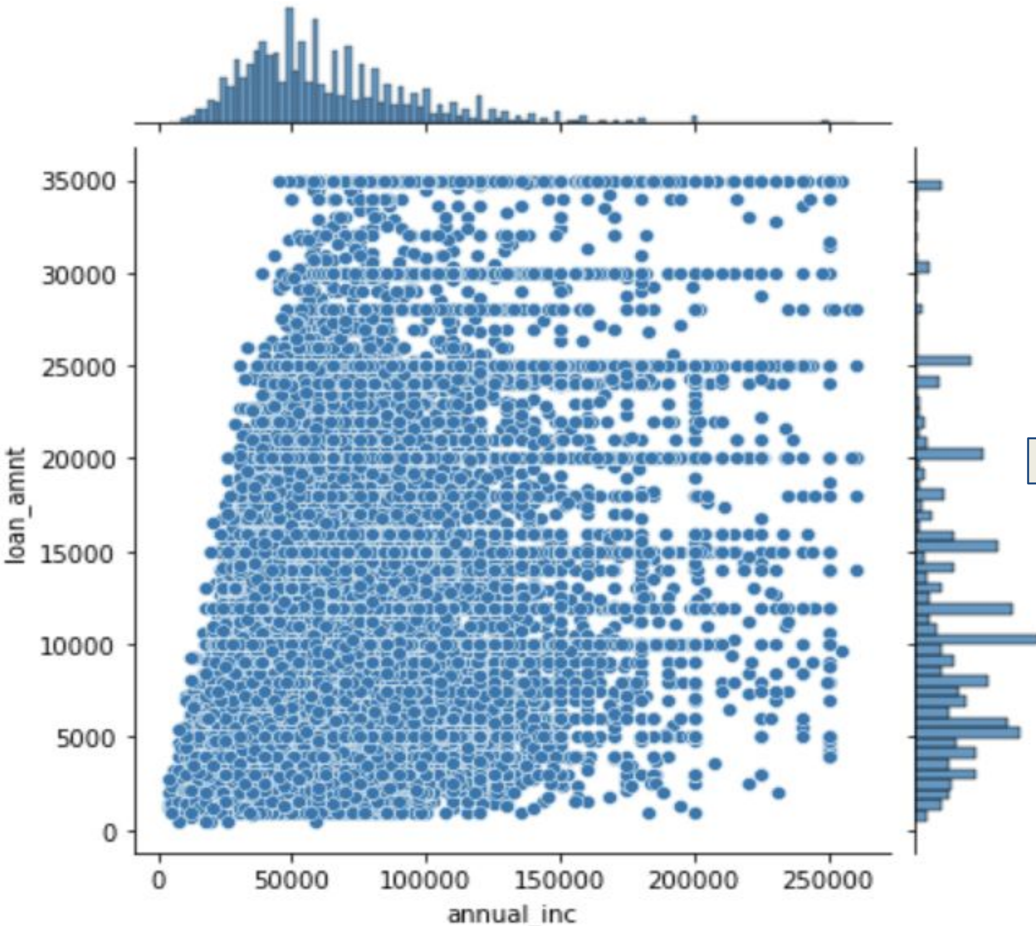
Analysis on defaults by % of loan amount in annual income



Defaults are low for loan amount less than 20% of annual income

Loan amount >= 30% of annual income can mostly lead to default

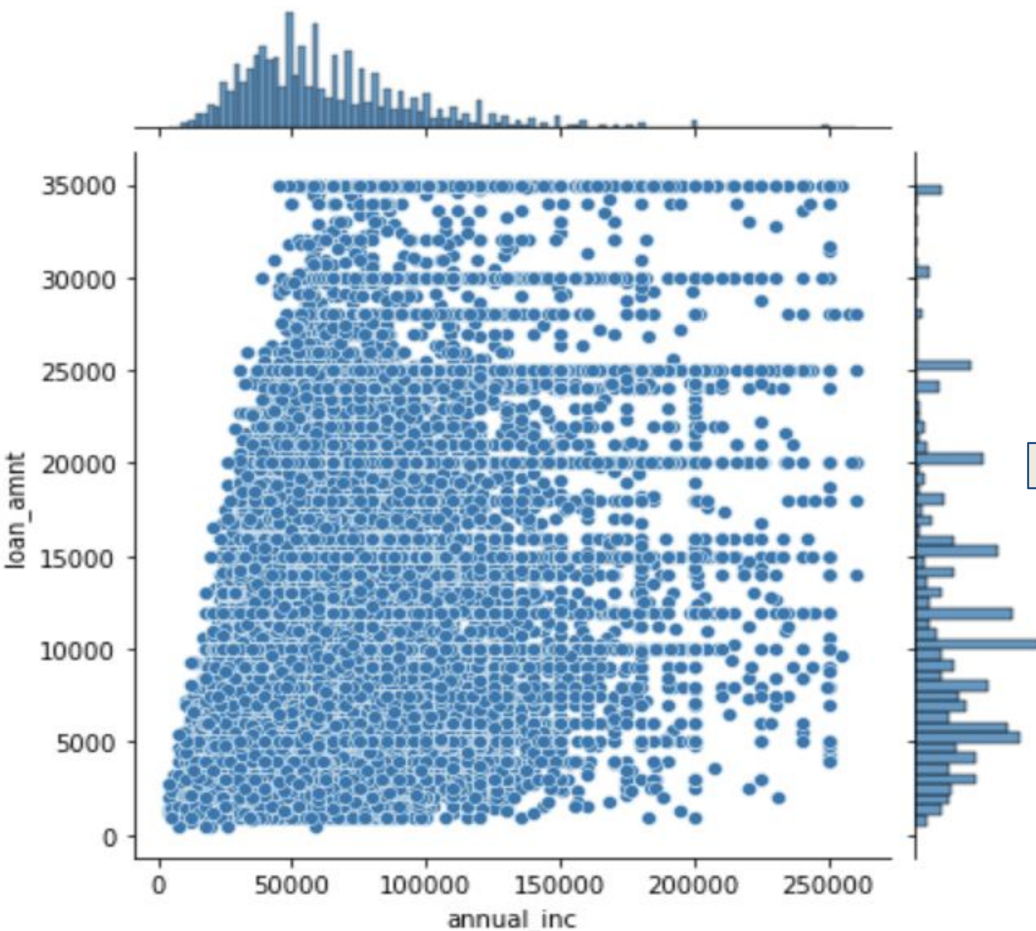
Analysis - Defaults by % of loan amount in annual income cont…



In the Lending Club dataset, loans of high amount is given for the people having low income.

We can see that the for the people having annual income < 50000 has loan amounts around 25000

Analysis - Defaults by % of loan amount in annual income cont…



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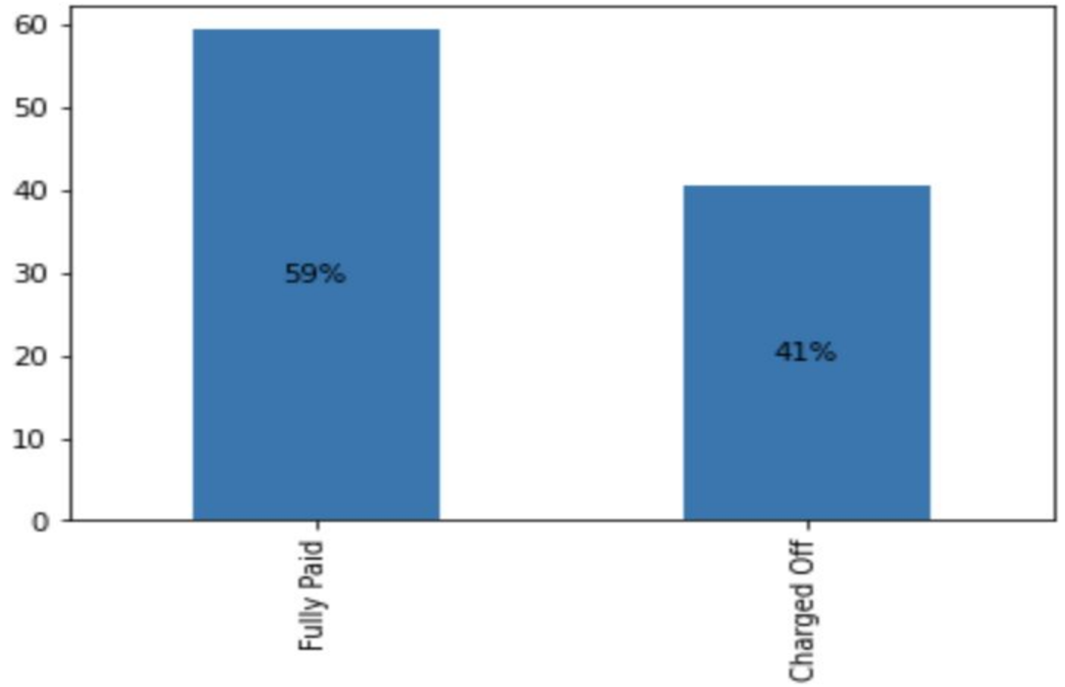
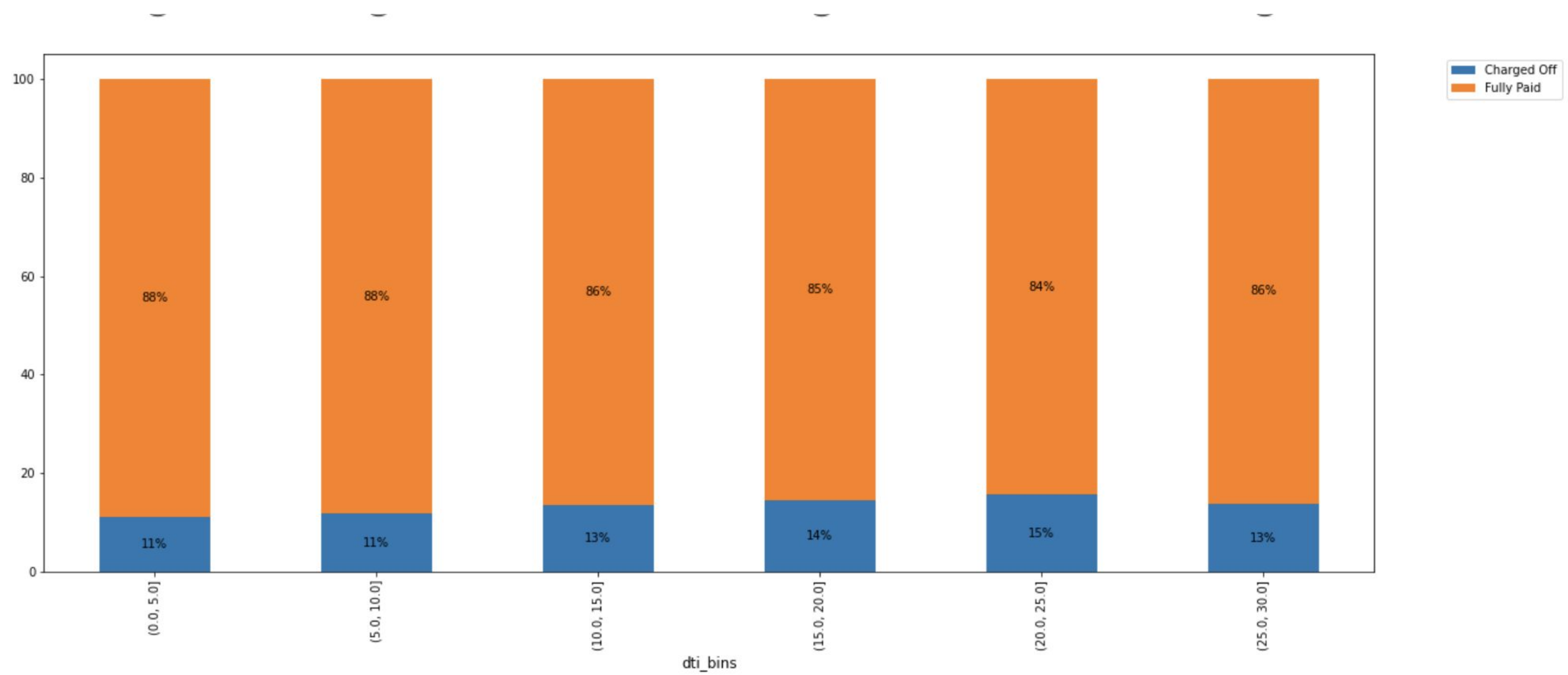
Analysis - Defaults by % of loan amount in annual income cont…



Above graph is for loans where loan amount is >= 25k and annual income <= 50k. We can clearly observe that default rate is very high for this category. From the previous scatter plot, we can see descent no. of loan applicants falls under this category which is very risky.

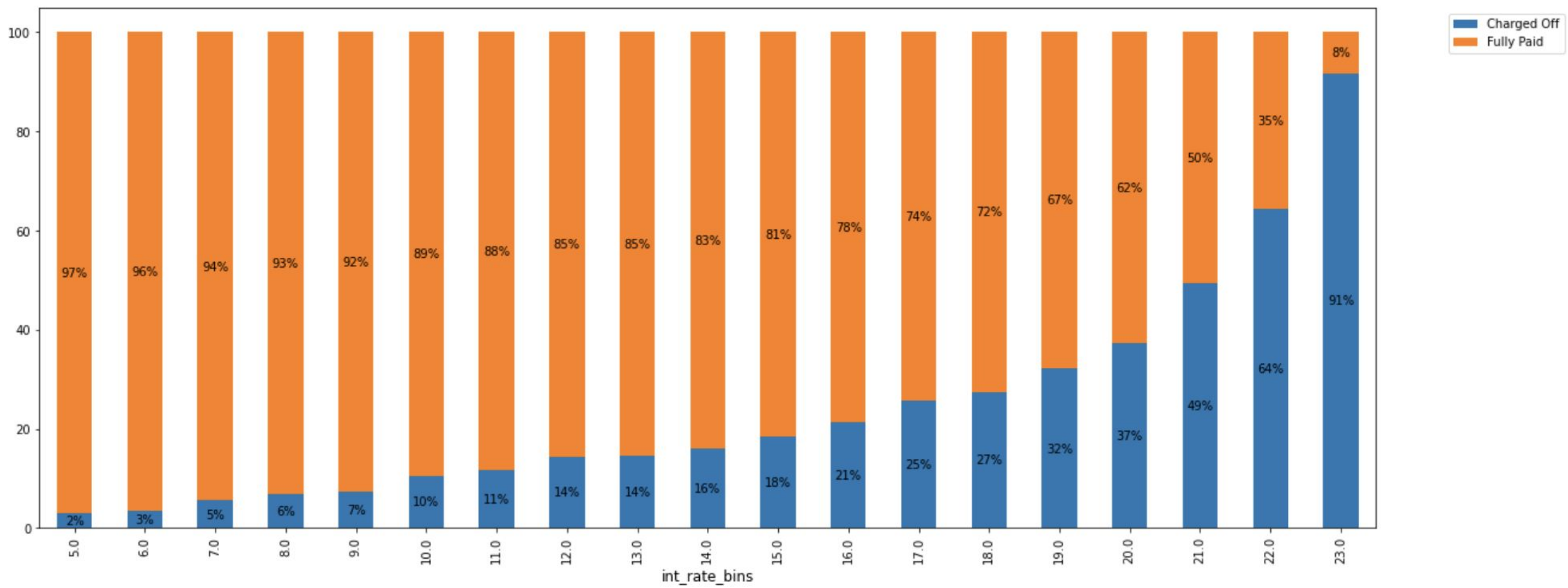
Analysis on defaults by DTI ratio



Percentage of defaults increases with increase in DTI.

We could consider 20 as threshold value for DTI, and loans above this value could be more risky.

Analysis on defaults by Interest rate



As expected, interest rate on charged off applicants is more when compared to fully paid. This should happen as the default rate or risk increases interest rate should also increase. This shows that the company is moving in right direction.

Recommendations

- Minimize issuing loans to small business.
- Avoid issuing loans where loan amount to annual income ratio is > 30%.
- LC should avoid considering loans with DTI > 20 or atleast should impose high interest rate so that number of applicants would be less.
- Reduce approving loans to applicants having previous bankruptcy records.