

# Lending Club Case Study

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# Agenda

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**01.** Problem Statement

**02.** Analysis Approach

**03.** Summary

# Problem Statement

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This company is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures. Borrowers can easily access lower-interest-rate loans through a fast online interface.

Like most other lending companies, lending loans to 'risky' applicants is the largest source of financial loss (called credit loss). Credit loss is the amount of money lost by the lender when the borrower refuses to pay or runs away with the money owed. In other words, borrowers who **default** cause the largest amount of loss to the lenders. In this case, the customers labelled as 'charged-off' are the 'defaulters'.

If one is able to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss.



# Business Objective

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To be able to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss. Identification of such applicant's 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 utilise this knowledge for its portfolio and risk assessment.



# Analysis Approach

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1. Data cleaning
2. Univariate analysis
3. Segmented univariate analysis
4. Bivariate analysis



# Date Cleaning

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1. Removed the duplicate values
2. Cleaned data with null values
3. Removed columns which had only single values in all the rows
4. Removed certain columns which did not add any value for defaulter analysis
5. To find out if the current user would default or not, we do not need the data of users whose loan is currently running. So we removed the rows with loan status as current



# Date Cleaning

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6. Made the term and emp\_length column to have only numbers.
7. Removed % sign from int\_rate and revol\_util column
8. Converted 'loan\_amnt', 'int\_rate', 'emp\_length' to numeric data type



# Observations

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- Around 85% is fully paid and 15% is charged off
- Most of the loans were taken for debt consolidation(47%) and Credit card bill payments. Other is also one of the main areas where loans were taken.





# Observations

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- When Annual income is low then dti is high and vice versa
- Annual income increases by employment length
- The loan amount also increases with an increase in annual\_inc and also the installment increases with annual\_inc
- Most of the Loan amounts are in the range of 5000 – 10000
- Most of the Interest Rates on loans are in range of 12% - 15%



# Observations

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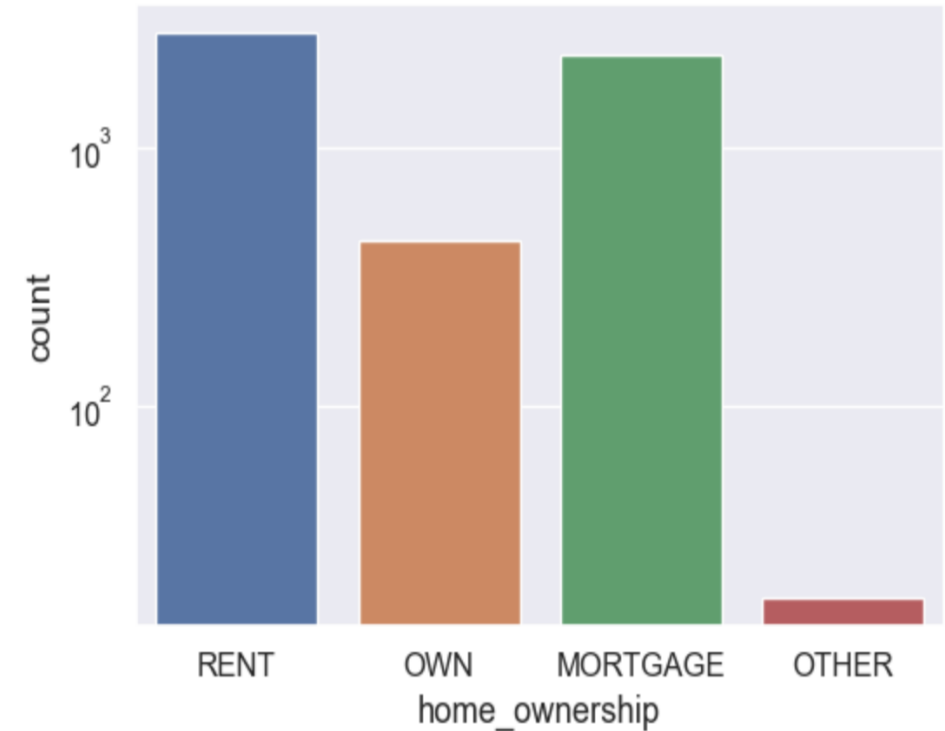
- Most of the borrower's Annual incomes are in the range of 60000- 80000
- Annual income increases by employment length
- The loan amount also increases with an increase in annual\_inc and also the installment increases with annual\_inc
- Most of the Loan amounts are in the range of 5000 – 10000
- Most of the Interest Rates on loans are in the range of 12% - 15%



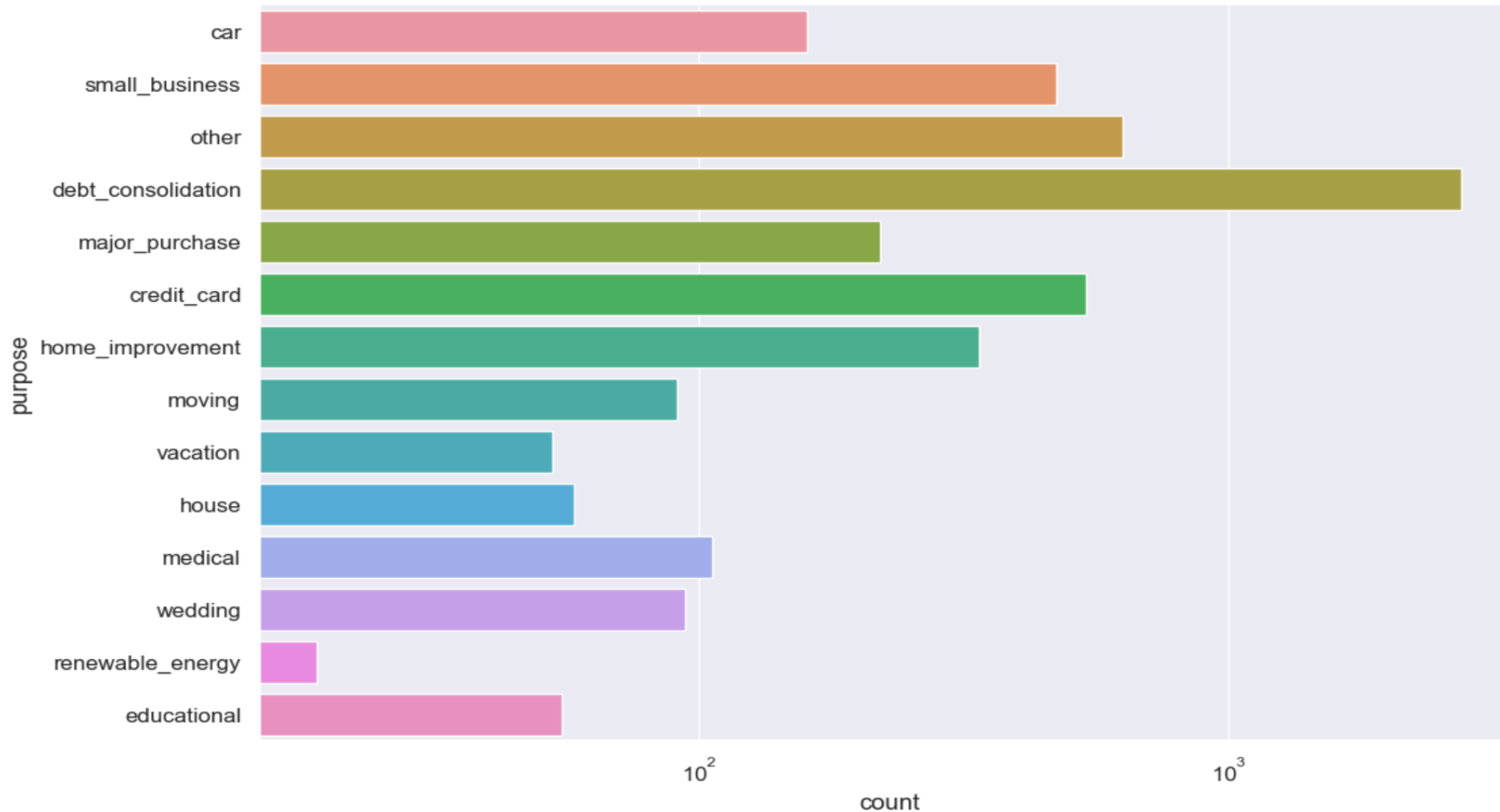
# Observations

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- It is observed that Mortgage and Rent homeowners contribute towards the defaulter

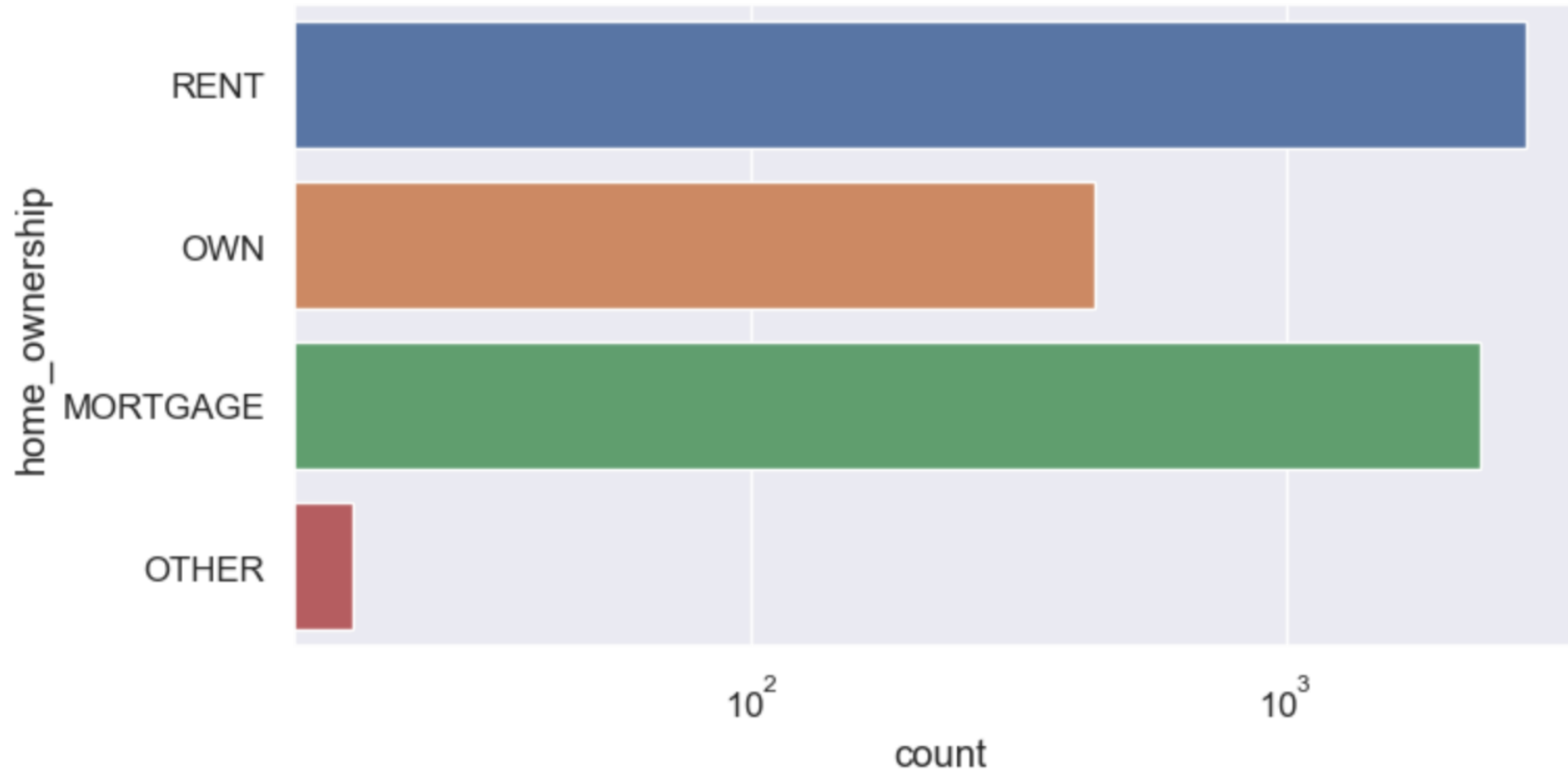


# Observations



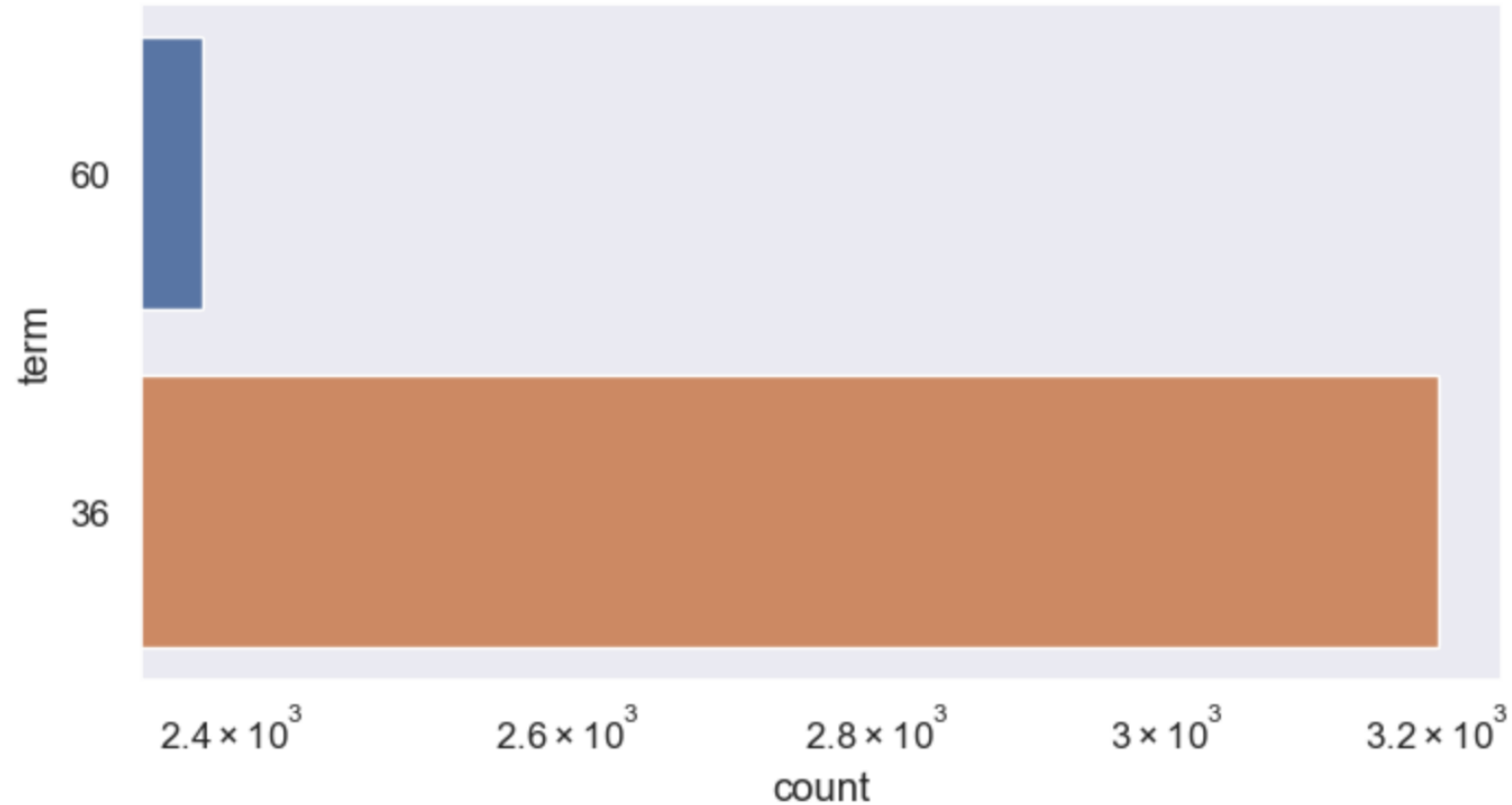
- Most of the loans were taken for the purpose of debt consolidation & paying credit card bill.
- Number of charged off count also high too for these loans.

# Observations



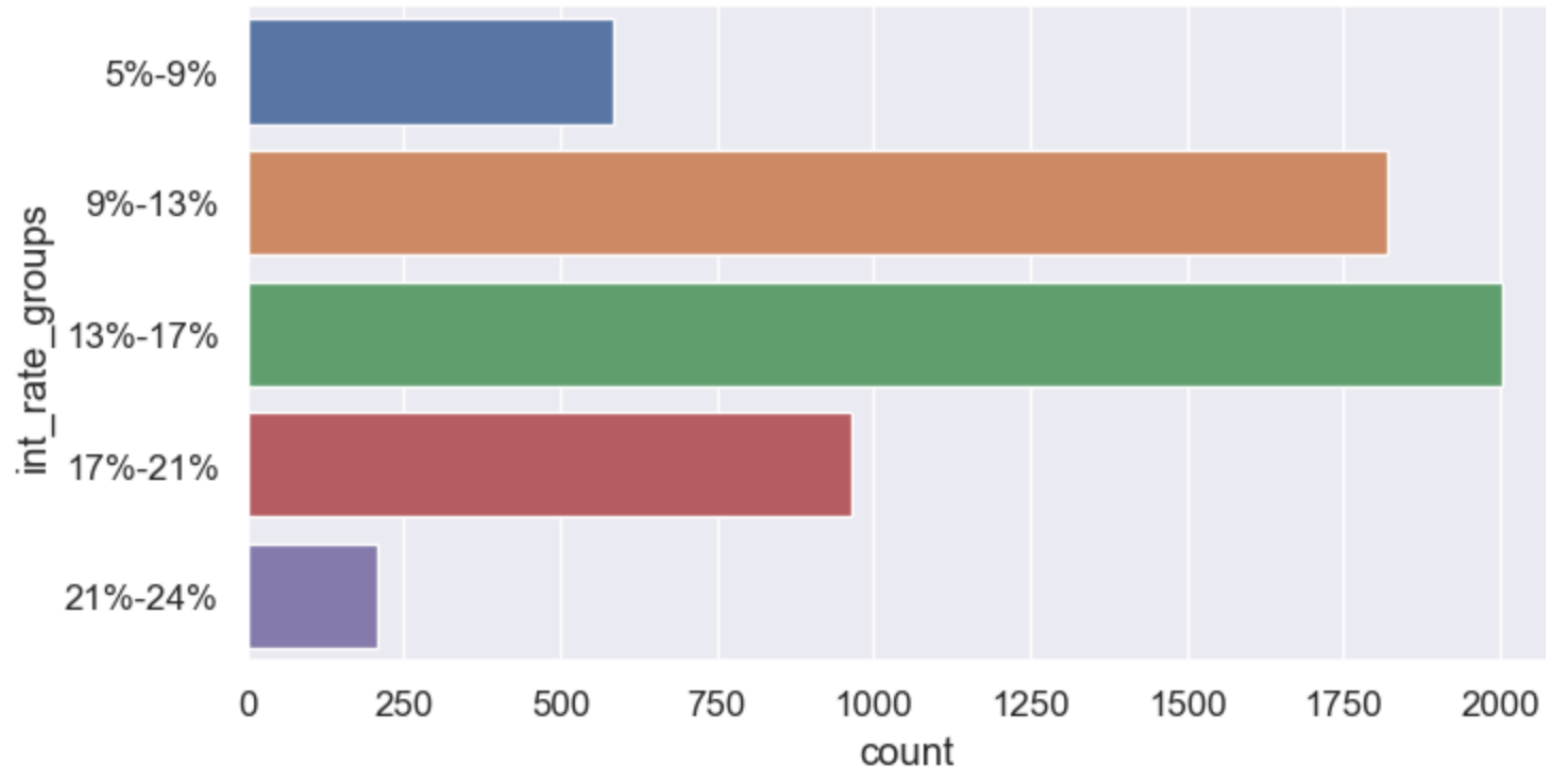
- Most of the applicants stay in rented home or mortgaged their home. Applicant numbers are high from these categories so charged off is high too.

# Observations



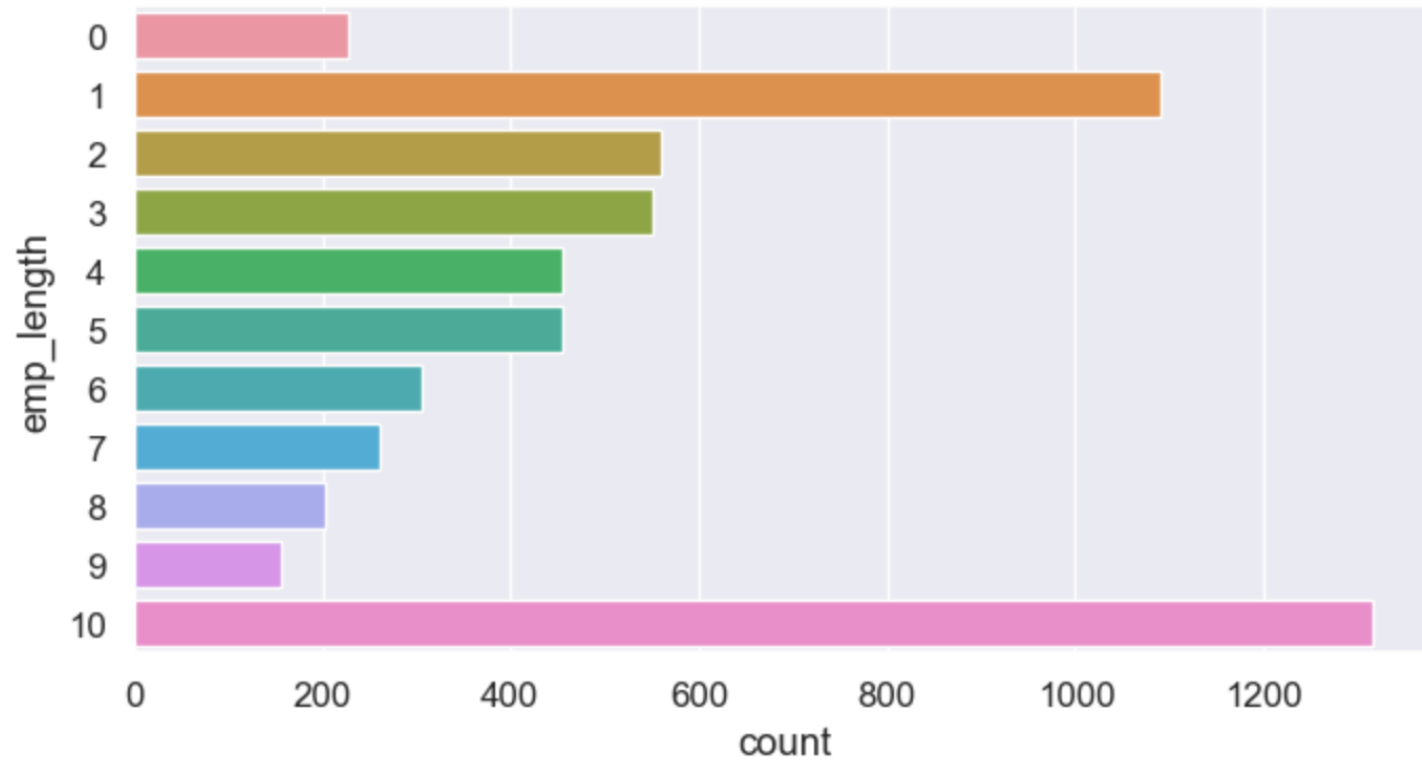
- Those who had taken a loan to repay in 36 months had more % of the number of applicants getting charged off as compared to applicants who had taken a loan for 60 months.

# Observations



- Charged off is seen more when the interest rates are between 13-17% and 9-13%

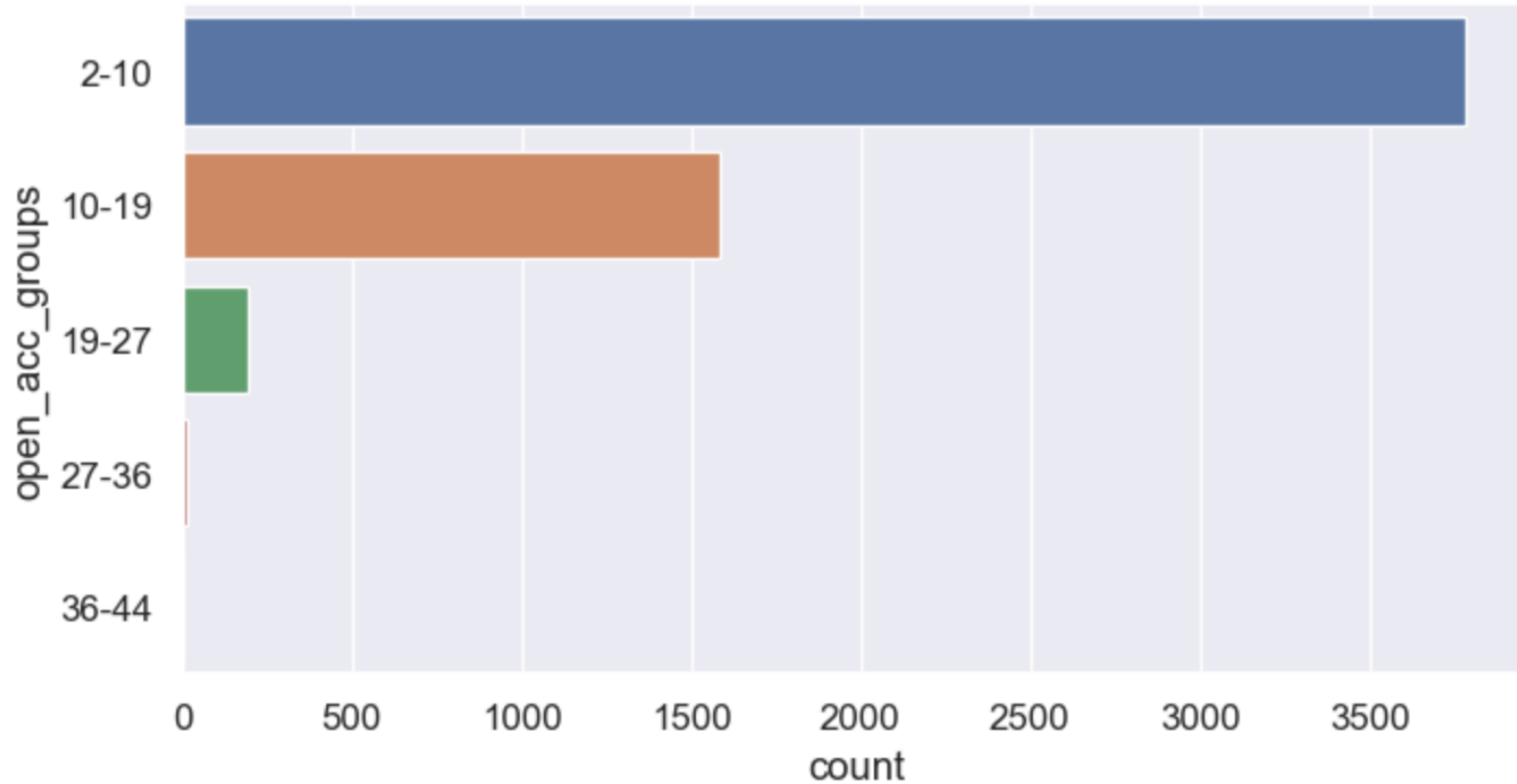
# Observations



- Charged off is more for people with work experience 10 years or with people with experience of 1 year

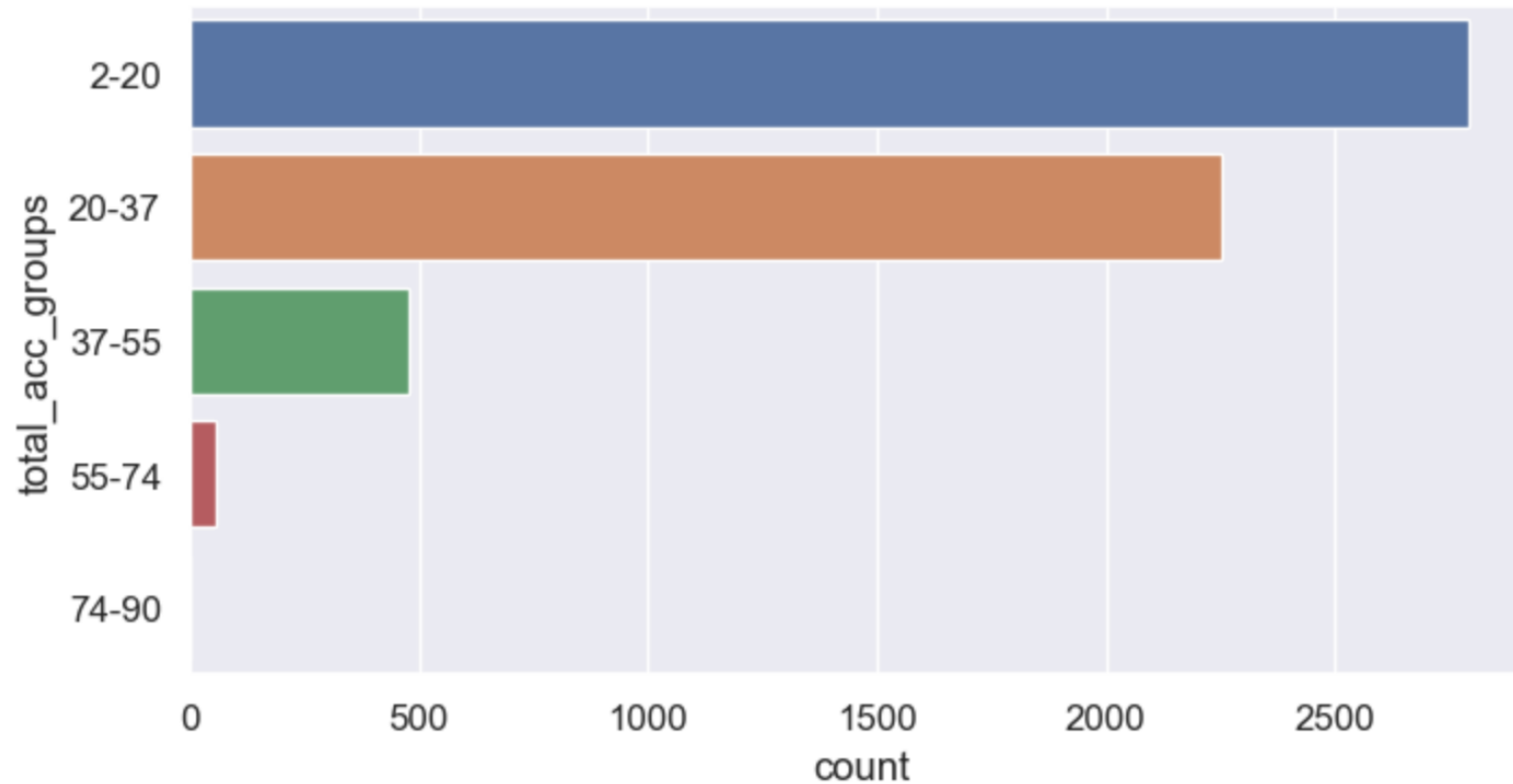


# Observations



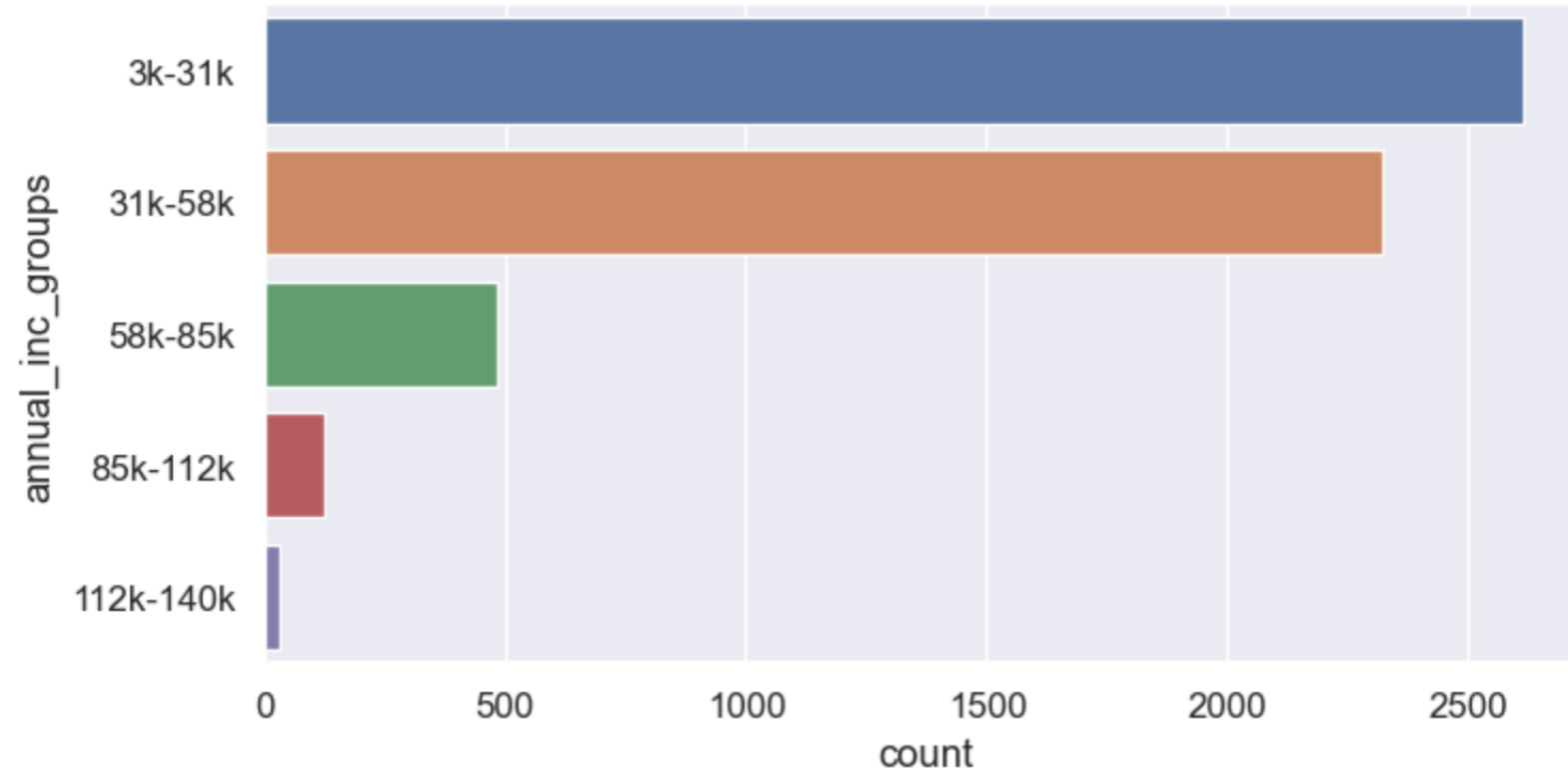
- charged off is seen more when the open acc groups (The number of open credit lines in the borrower's credit file) is between 2-10

# Observations



- charged off is seen more when the total\_acc (The total number of credit lines currently in the borrower's credit file) is between 2-20 and then 20-37

# Observations

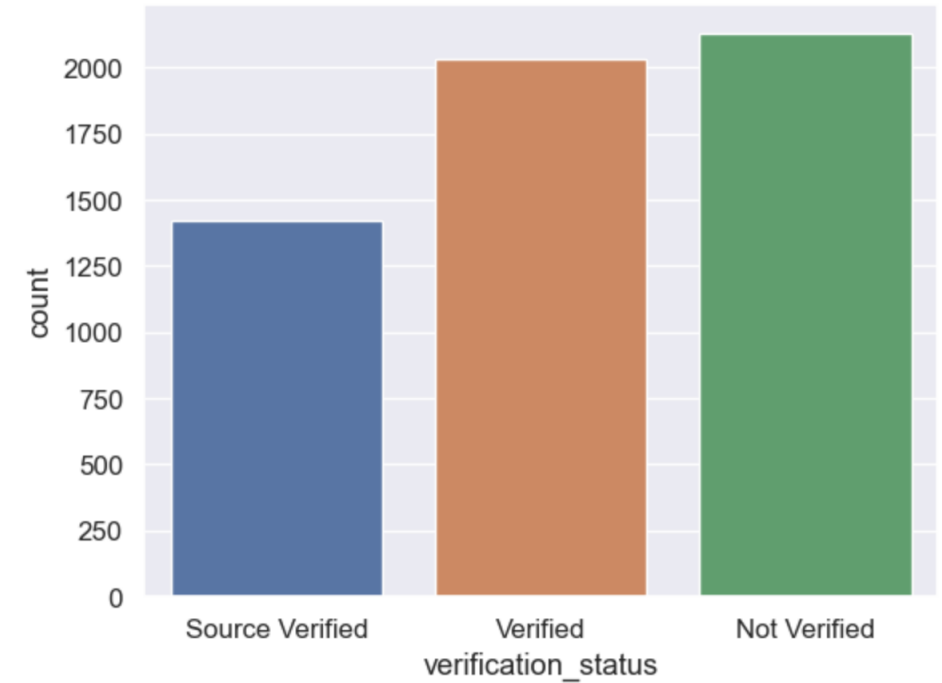


- charged off is seen more when the annual inc is between 3k to 58k. More defaulters are seen in the annula income between 3K - 31K

# Observations

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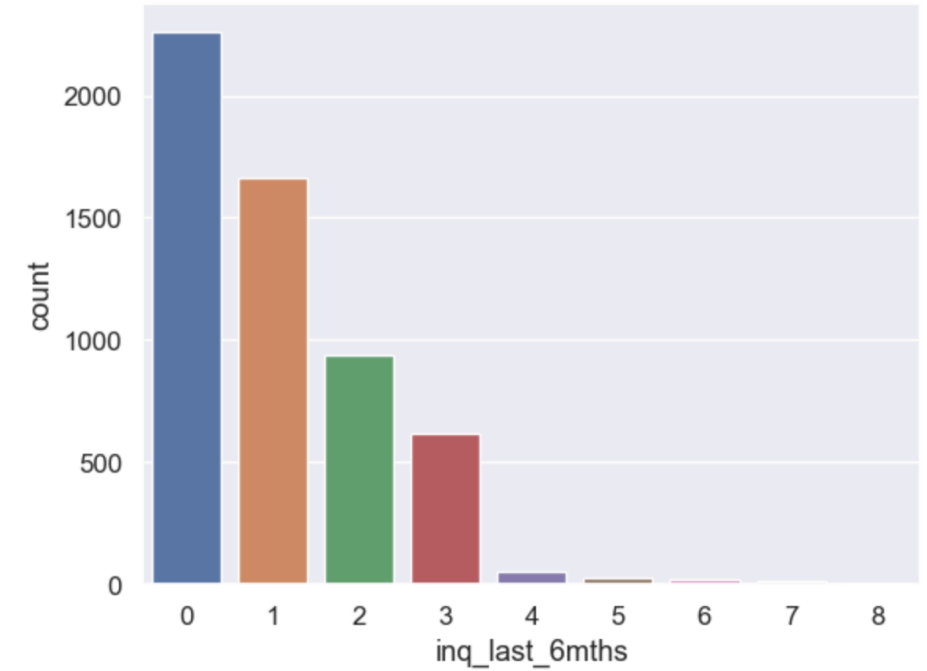
- More defaulters are seen when the application is not verified and also for verified application



# Observations

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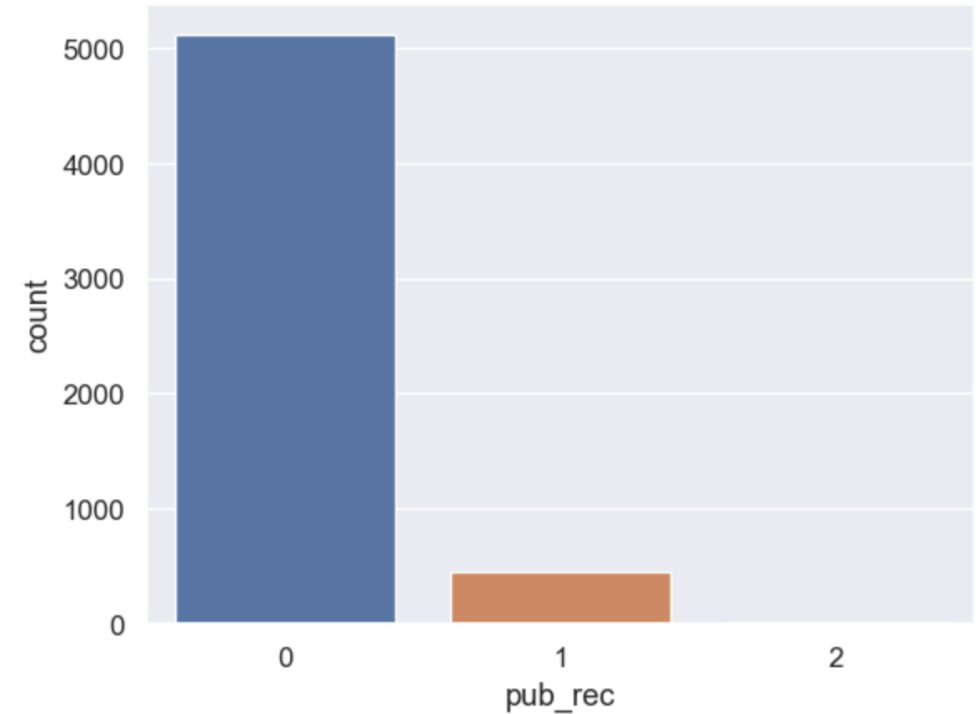
- More defaulters are seen when the inquiries in last 6 months is between 0-3

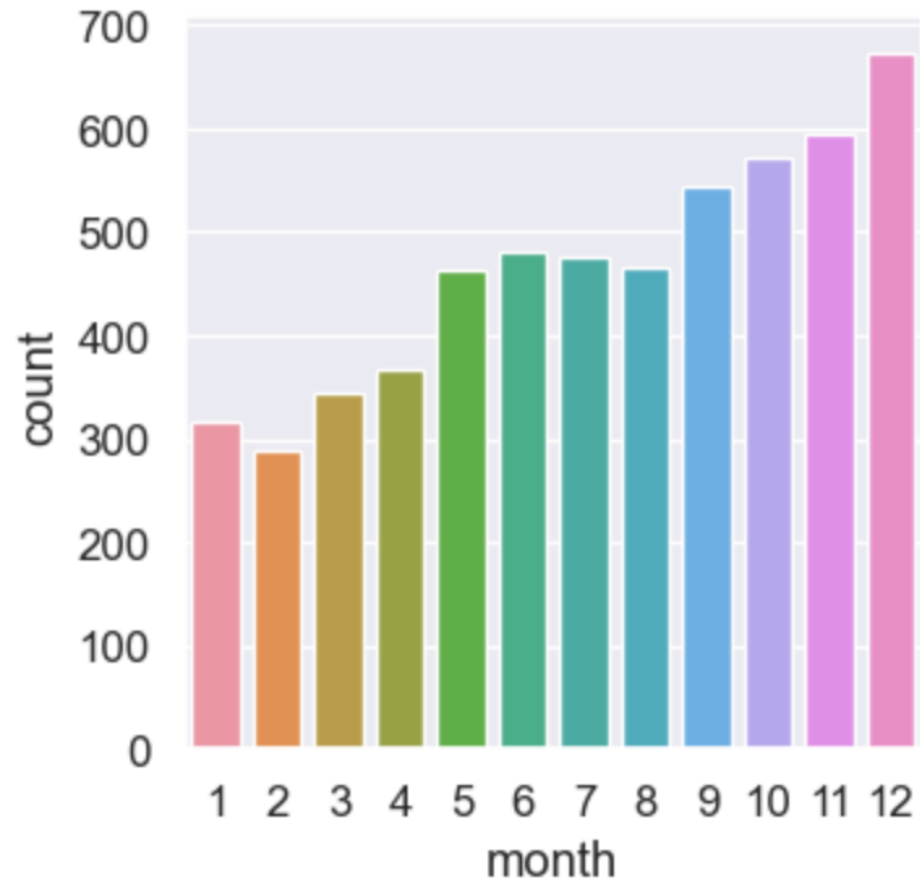


# Observations

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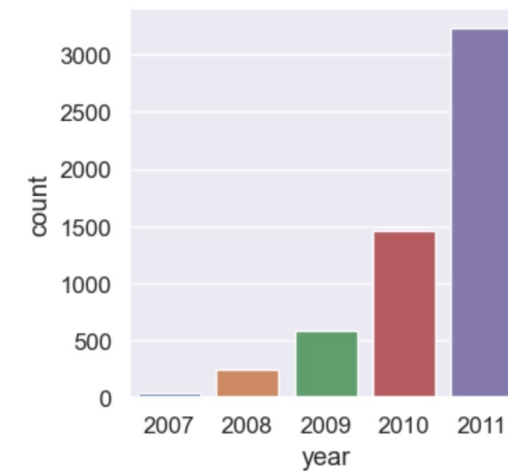
- More defaulters are seen when the Number of derogatory public records is 0





# Observations

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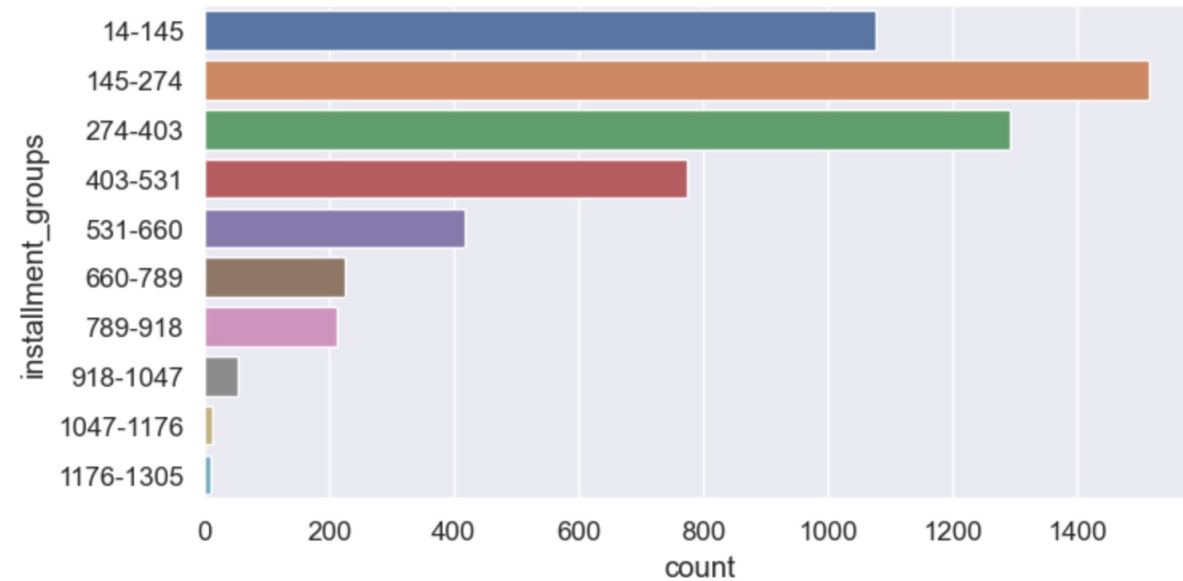


- Charged off is seen more in dec 2011

# Observations

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- More defaulters are seen for 145-274 installment group

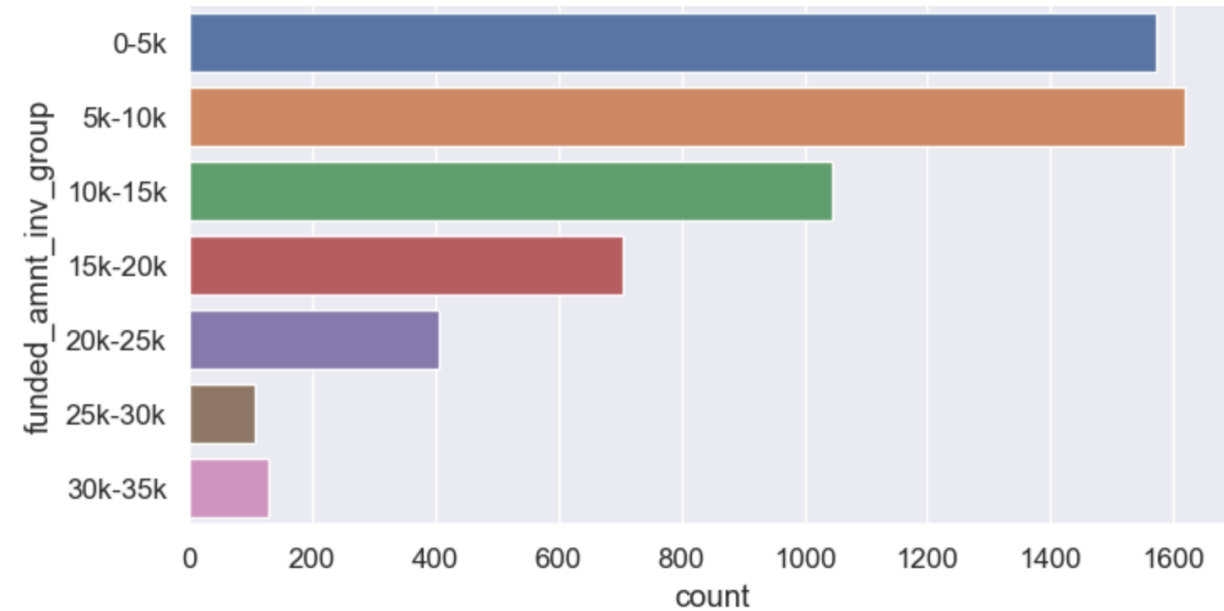




# Observations

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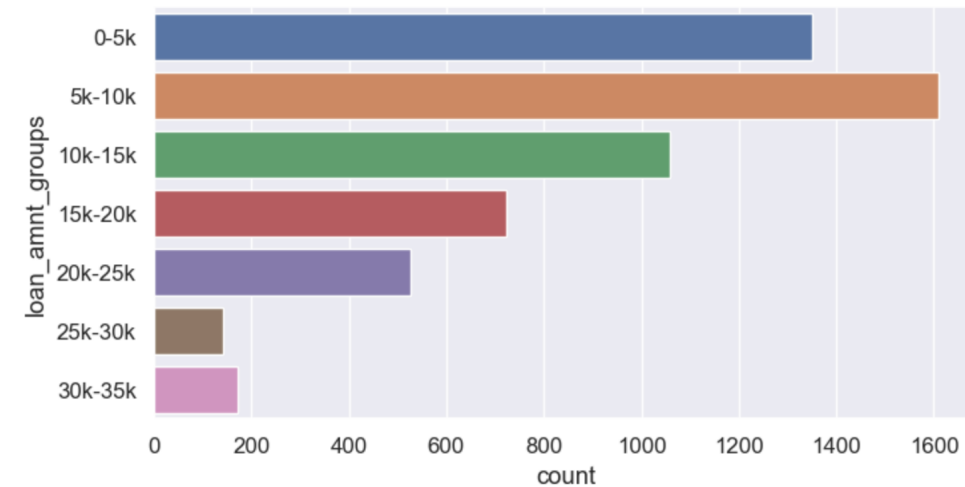
- More defaulters are seen for funded\_amt\_inv amount between 5k-10k



# Observations

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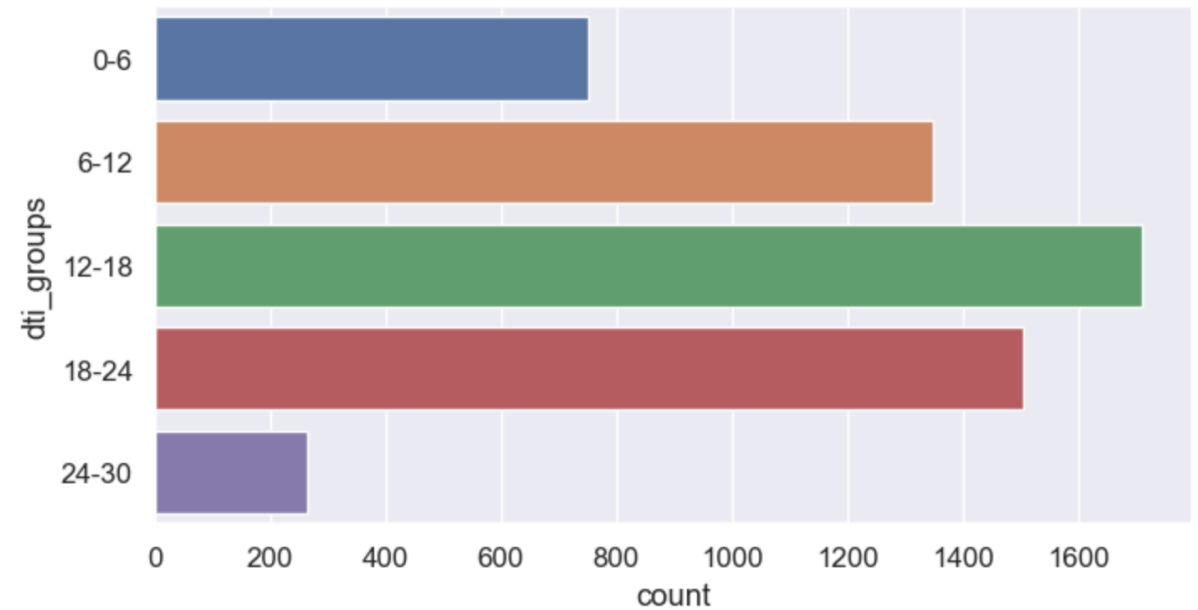
- more defaulters are seen for 5k-10k loan amount



# Observations

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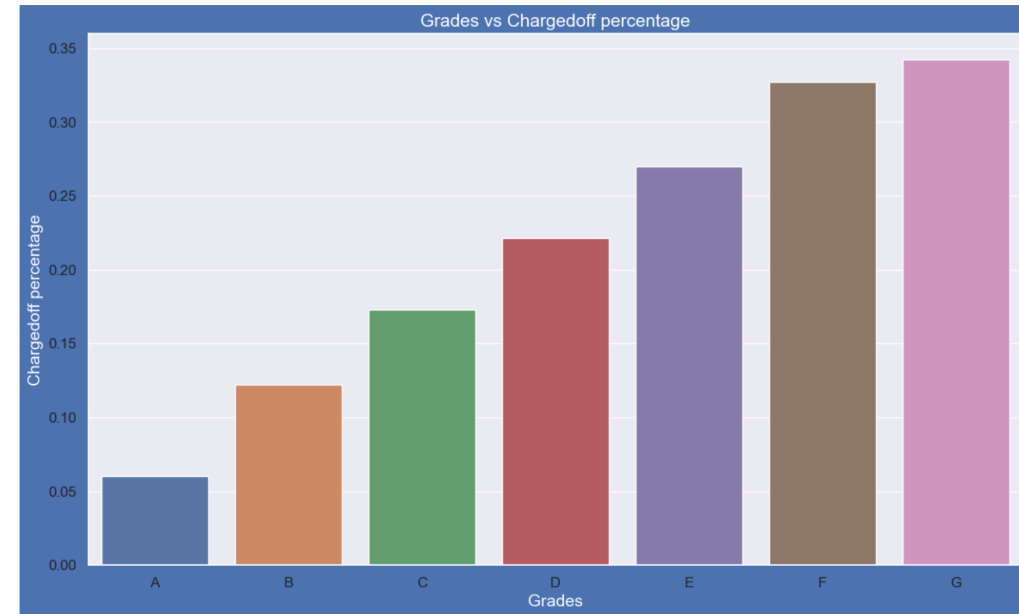
- more defaulters are seen for 12-18 dti group, however more defaulters are seen from 6-24 dti with 12-18 dti is the highest.



# Observations

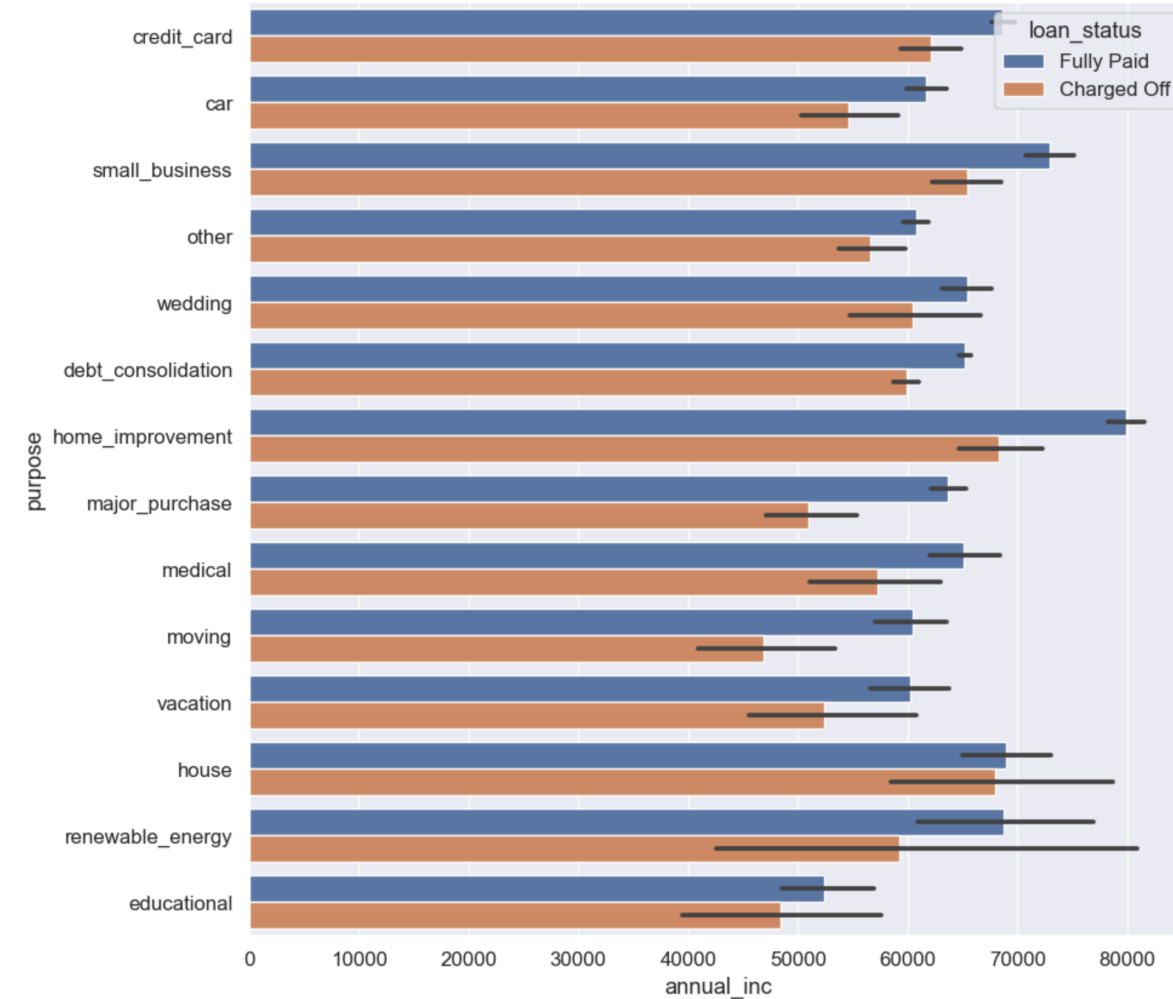
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- Grade "F" and "G" have very high chances of charged off. Chances of charged off is increasing with grade moving from "A" towards "G"



# Observations

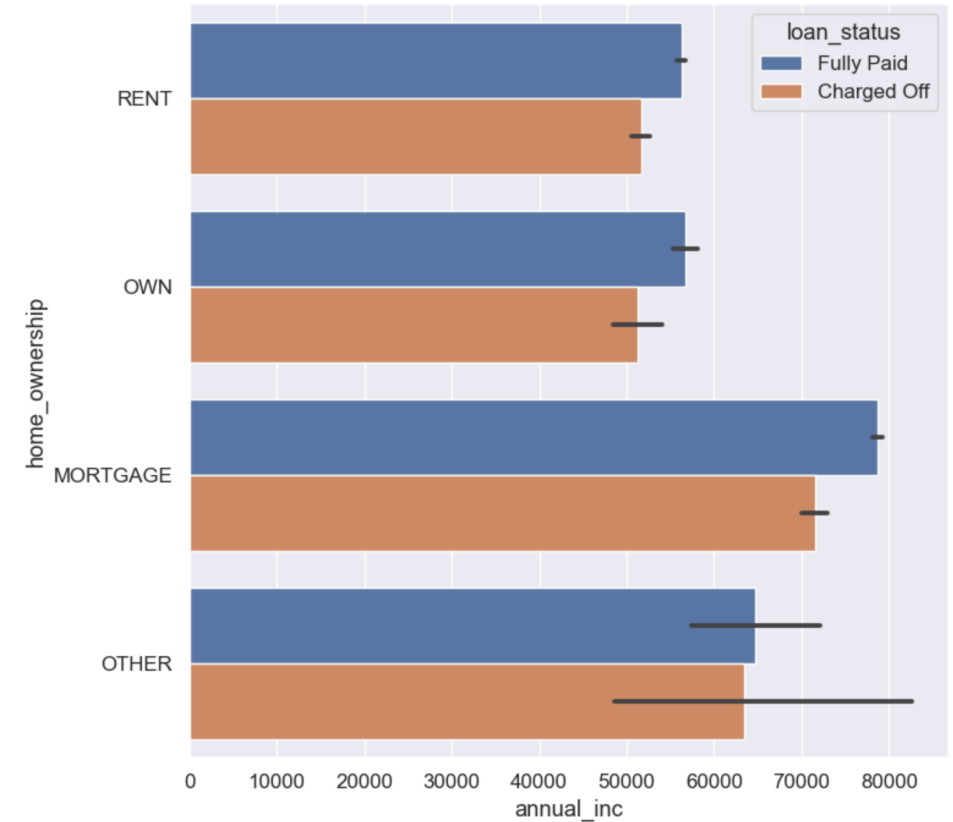
- charge off is seen more in home\_improvement and house and these people had low income in that purpose than the people who fully paid
- Applicants with higher salary mostly applied loans for "home\_improvement", "house", "renewable\_energy", "credit\_card" and "small\_businesses"



# Observations

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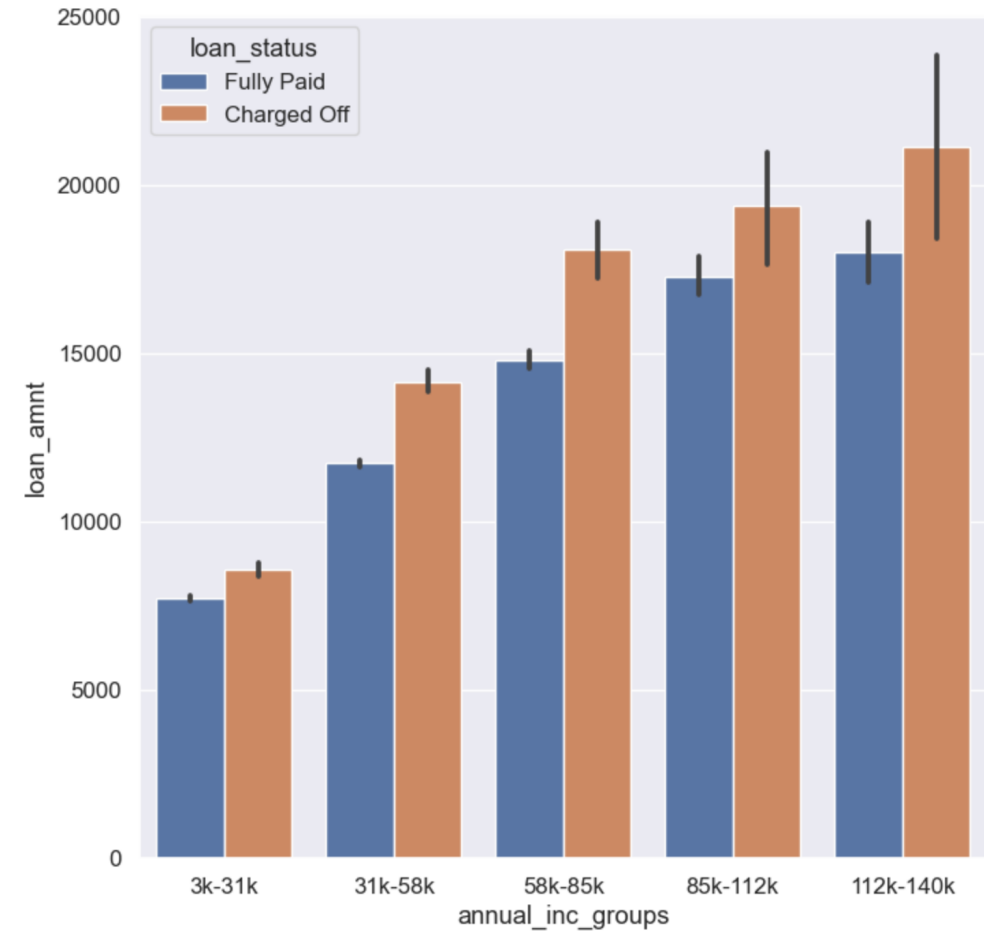
- charged off is seen high for mortgage home\_ownership with lower annual income



# Observations

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- Across all the income groups, the defaulters are those who took higher loan amount



# Observations

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- across all the interest rate the charge off is higher for low annual inc and is most charge off is seen in interest rate of 21-24%

