Lending Club Case Study

Group Members:

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Abstract

LendingClub is a financial services company headquartered in San Francisco, California. It was the first peer-to-peer lender to register its offerings as securities with the Securities and Exchange Commission, and to offer loan trading on a secondary market. so When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile.

Loan Term Countplot

Count plot for loan term (Charged off)
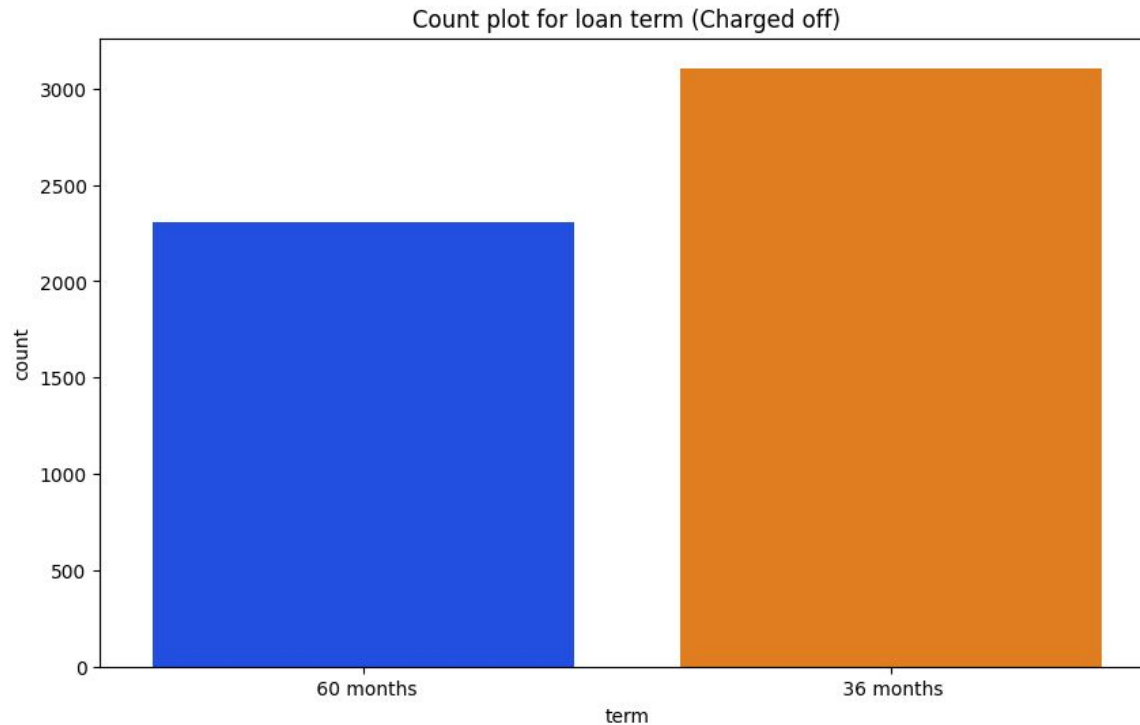
Number of Loans charged off is considerably greater for Loans with tenure as 36 months

Income Source Verification Status Countplot

Count plot for Income source verification status (Charged off)
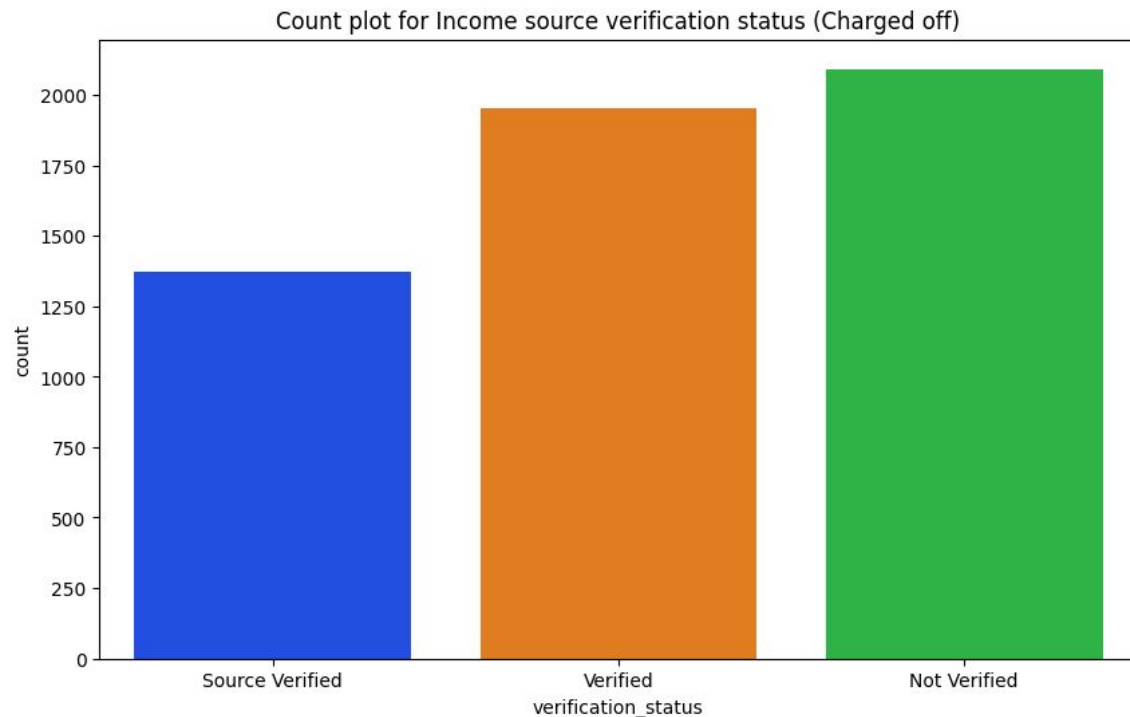
Among all loans charged off, the ones with source as unverified are more in number than verified counterparts

# Loan Purpose Countplot

Count plot for loan purpose (Charged off)
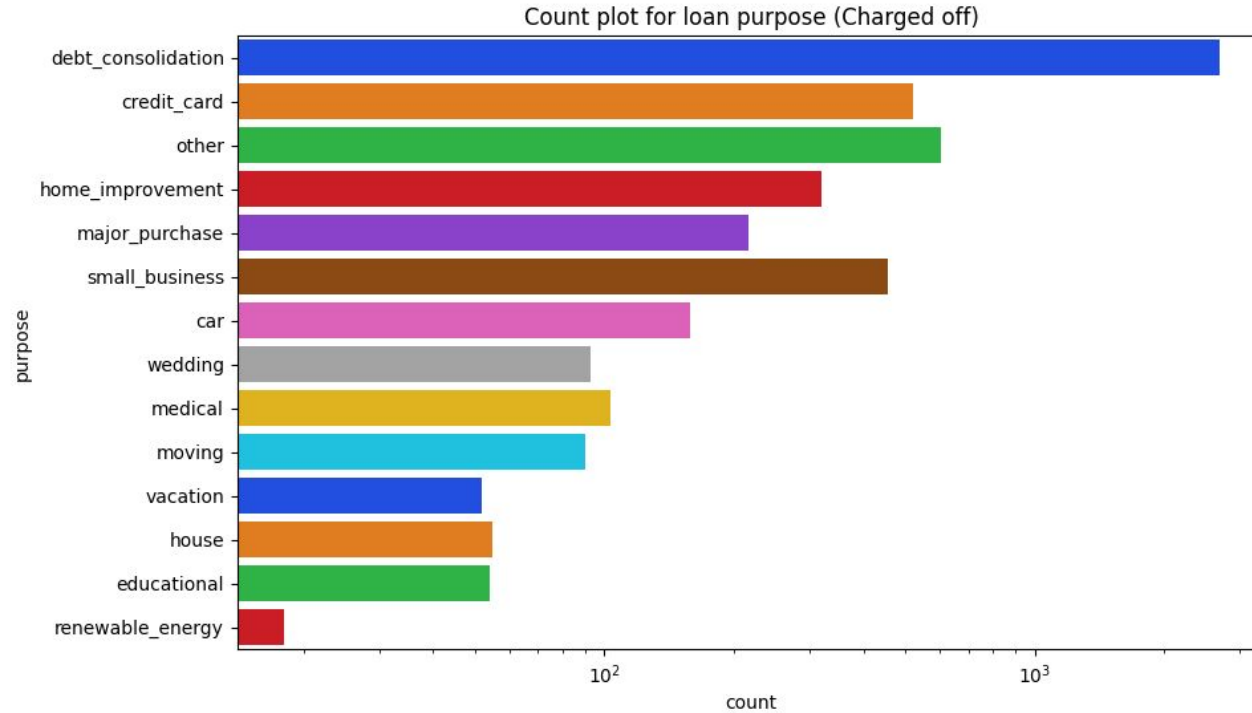
Among all loans charged off, the ones intended for debt consolidation are higher in number

Borrower's State(Residence State) Countplot

Count plot for Borrower's State (Charged off)
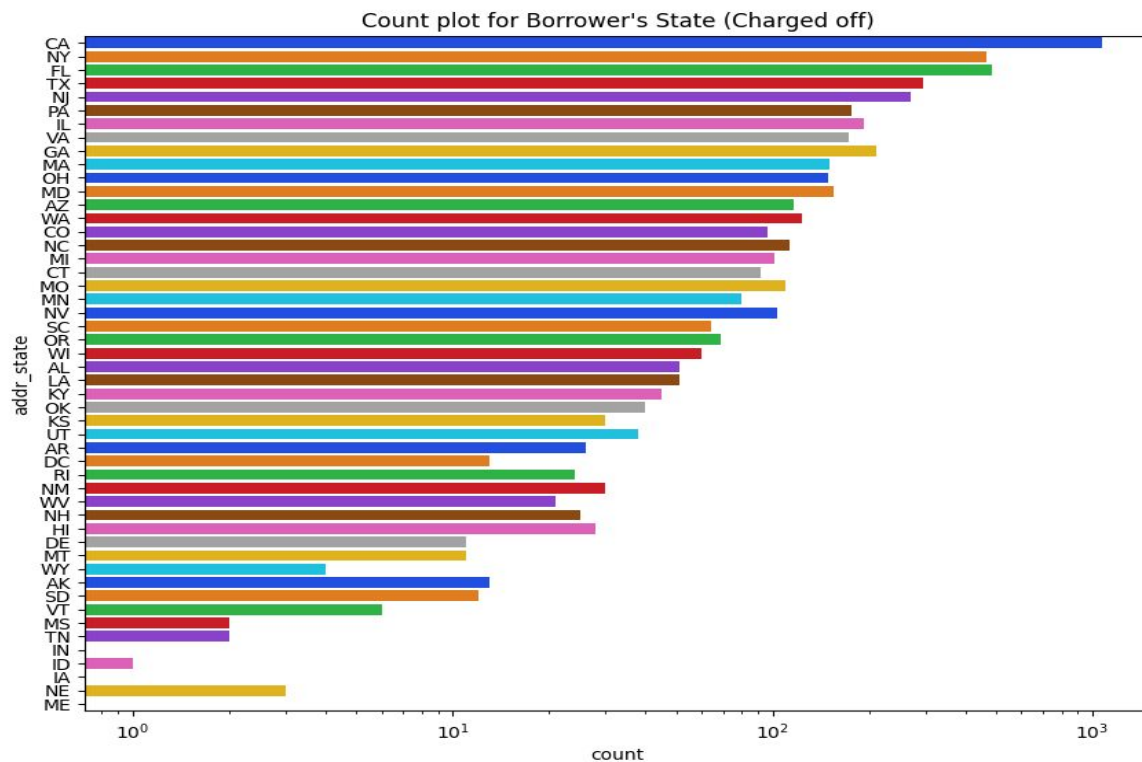
States like CA, FL and NY had higher number of charged off loans than compared to states like IN, IA and ME with no charged off loans

Employment Loan Countplot

Count plot for employment record (Charged off)
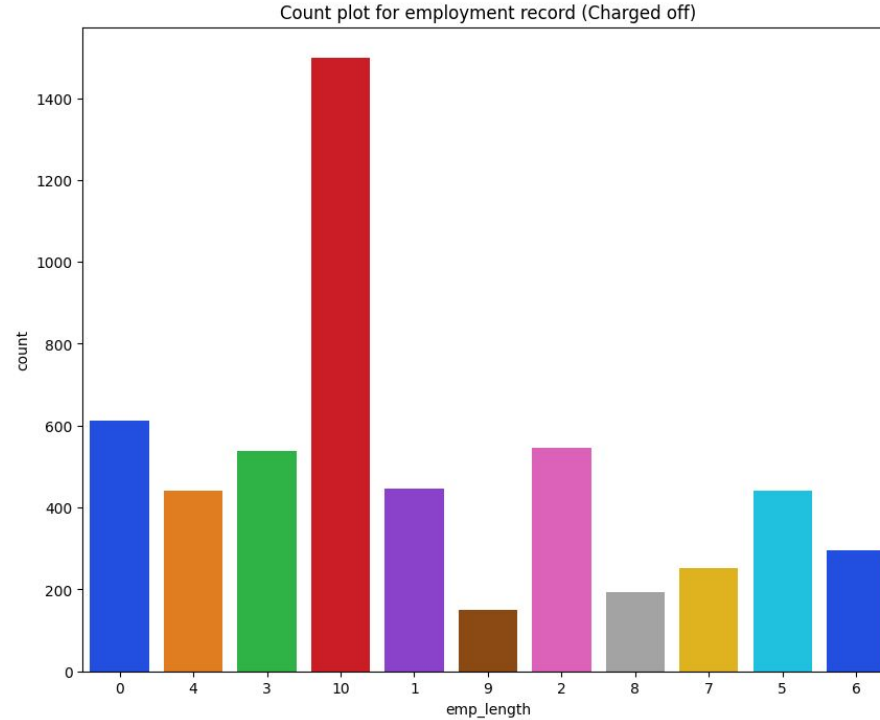
People having employment tenure of 10 years had higher number of charged off loans than other years of employement tenure

Loan Grade Countplot

Count plot for Loan grade (Charged off)
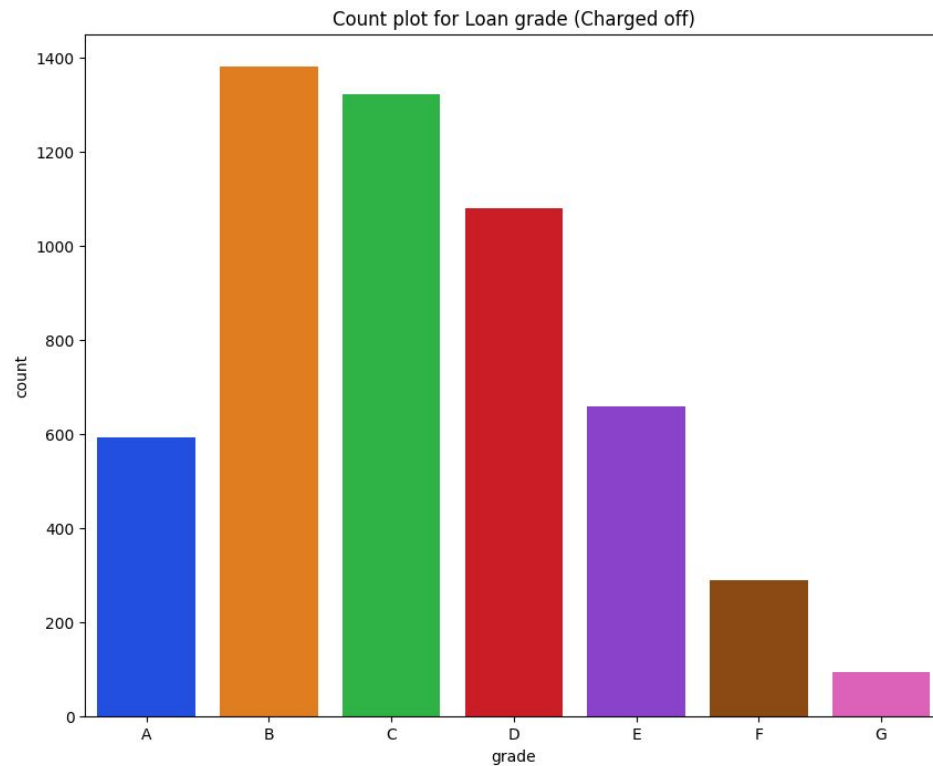
Loan Grades B and C had higher number of charged off loans as compared with other loan grades

Home Ownership Countplot


Count plot for Home ownership (Charged off)
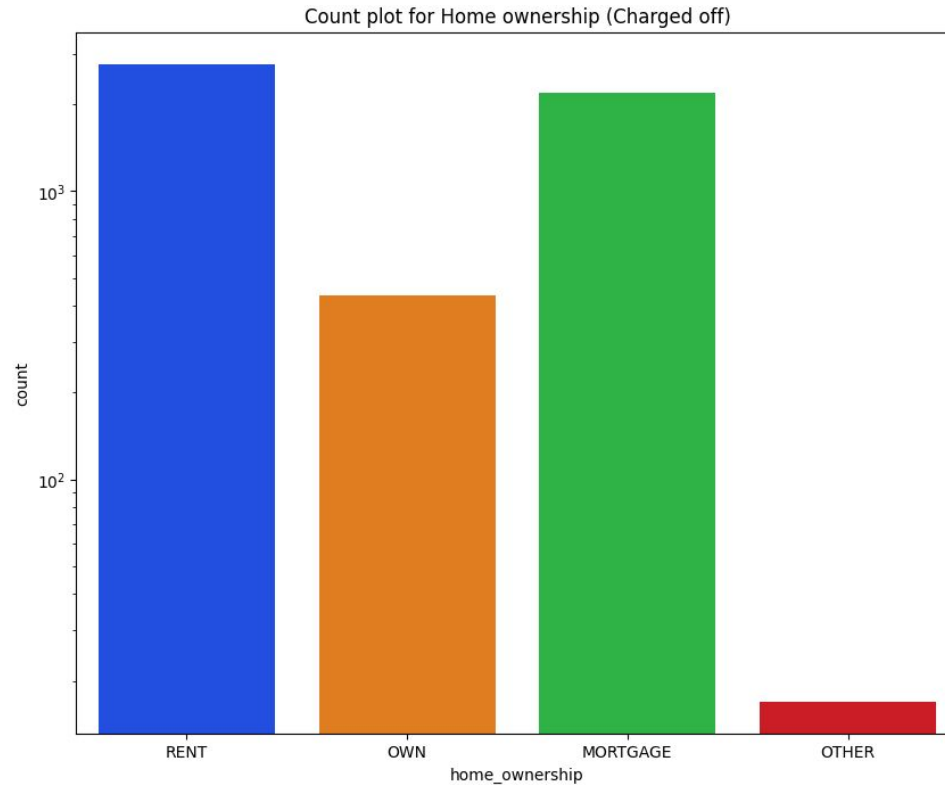
Among all charged off loans, individuals living in rented apartments or having a mortgage had higher chance of loans being charged off

Number of Inquiries Countplot

Count plot for Inquiries done in last 6 months (Charged off)
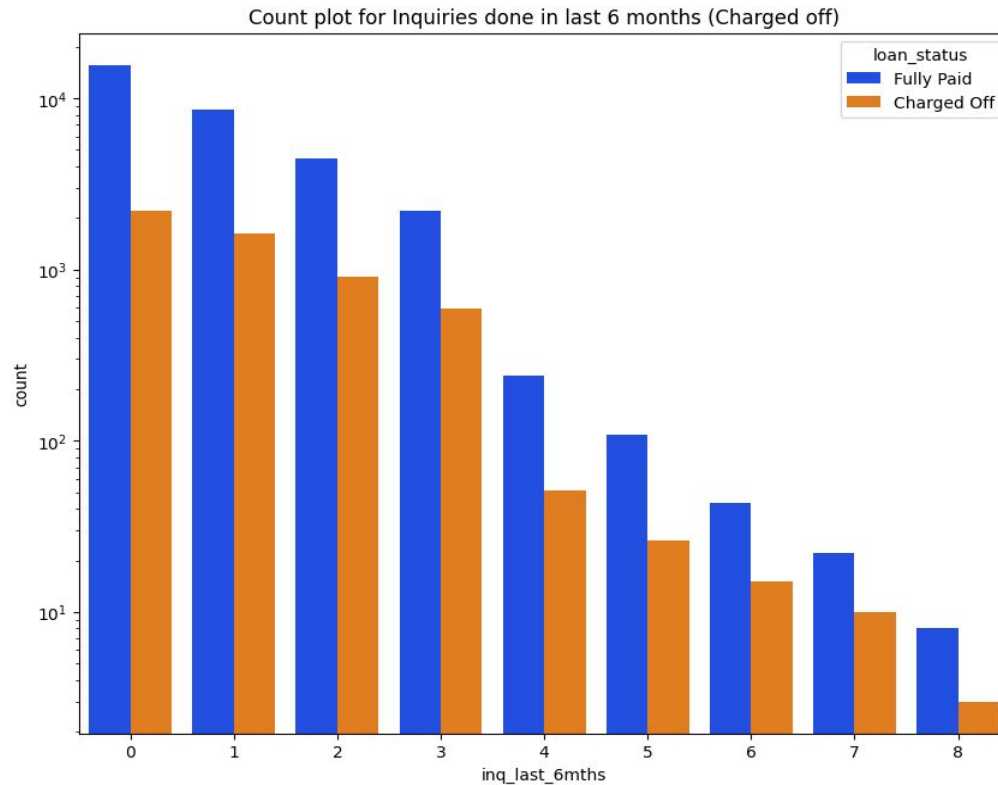
The number of charged off loans decreased with a decrease in the number of inquiries

Issue Month Countplot

Count plot for loan issue months (Charged off)
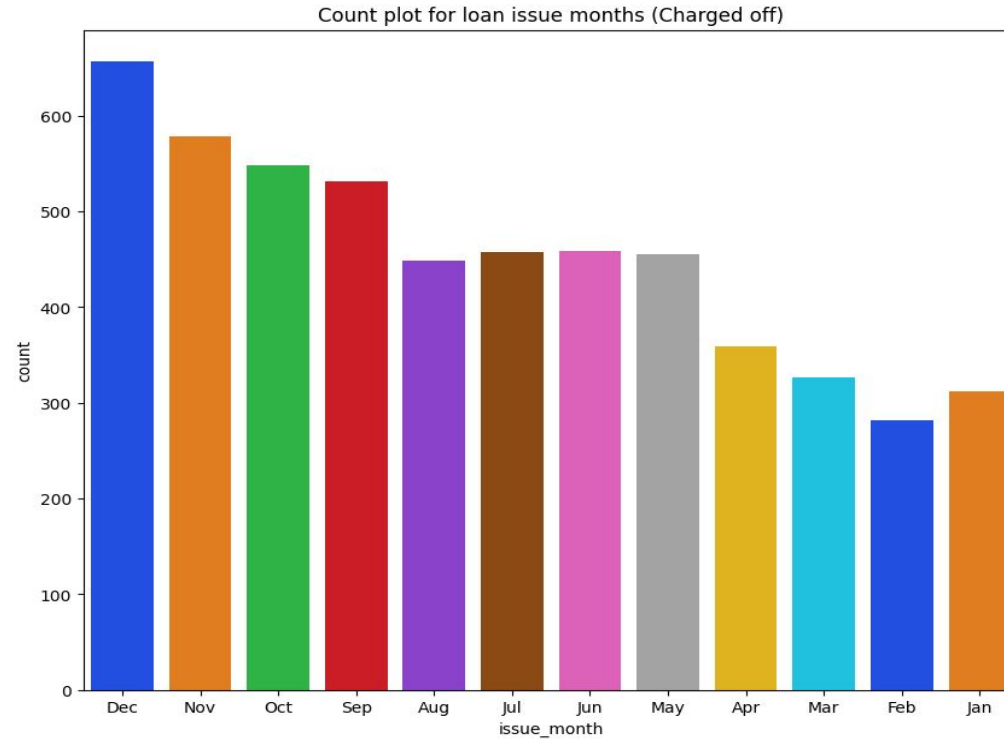
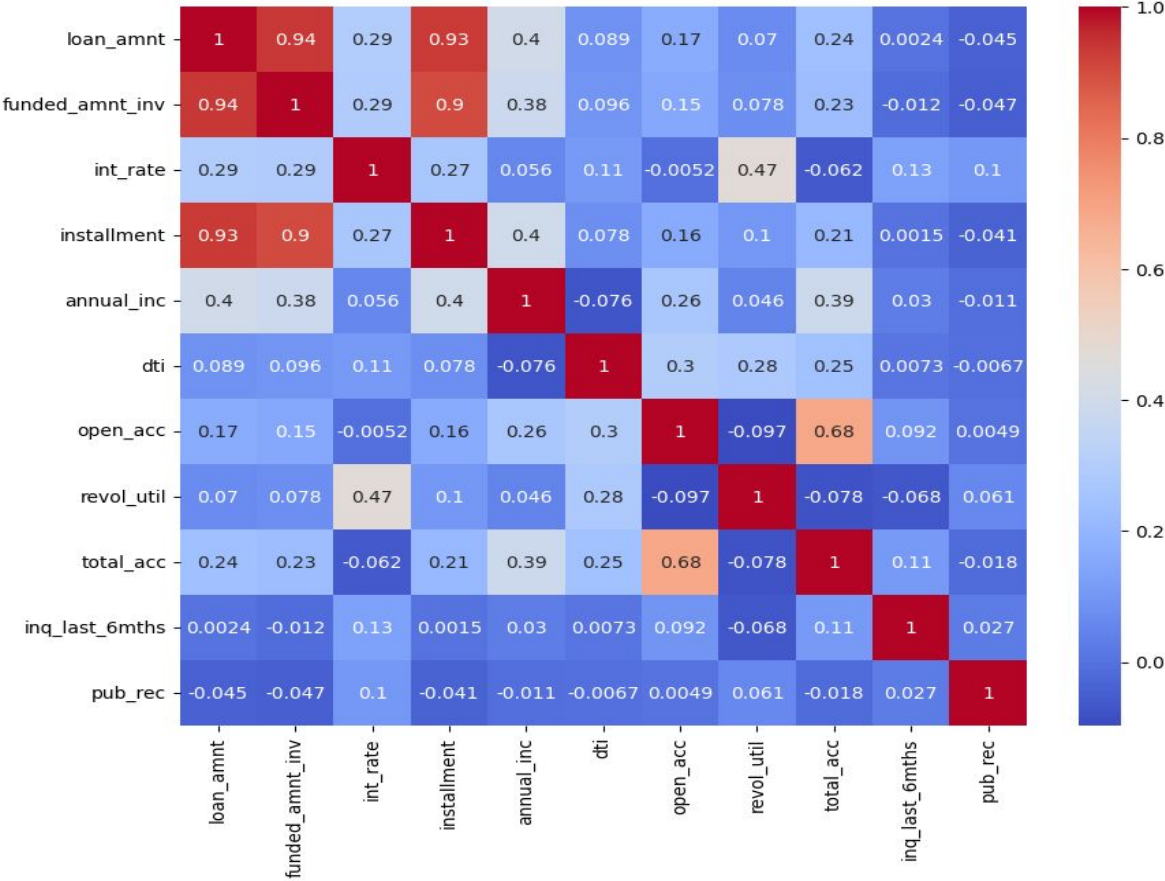**Loans issued in the month of December has more loans as charged off compared to other months**

Issue Year Countplot

Count plot for yearwise loan issue months (Charged off)
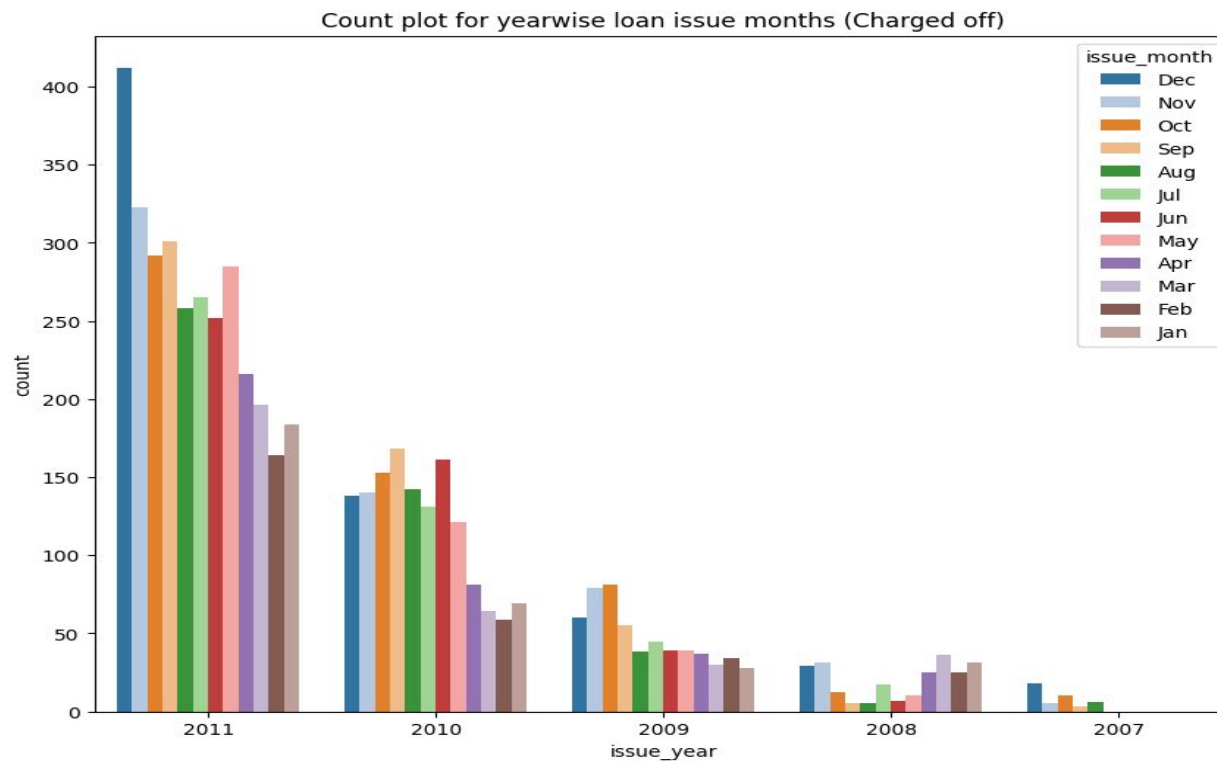
Loans issued in years 2011 had considerably higher number of charged off loans than other years

Correlation Heatmap for Numerical Columns

Correlation Heatmap for Numerical Columns

Observations:

- **Loan Amount is having a positive strong correlation with Annual Income**

  This suggests as annual income of individuals increased the amount for loans increased considerably too.

- **Loan Interest rate is showing positive strong correlation with revol_util(Revolving Balance)**

  This suggests individuals with high revolving balance took up loans with higher interest rate.

- **Dti is showing a weak negative correlation with annual income**

  This suggests dti varied slightly negative with an increase in the annual income of individuals

- **Total Number of accounts is showing a moderate positive correlation with Annual Income of the user**

  This means as the number of accounts increased the annual income of the users increased too.

Installments Account Group Countplot

Count plot for Installment amount groups (Charged off)
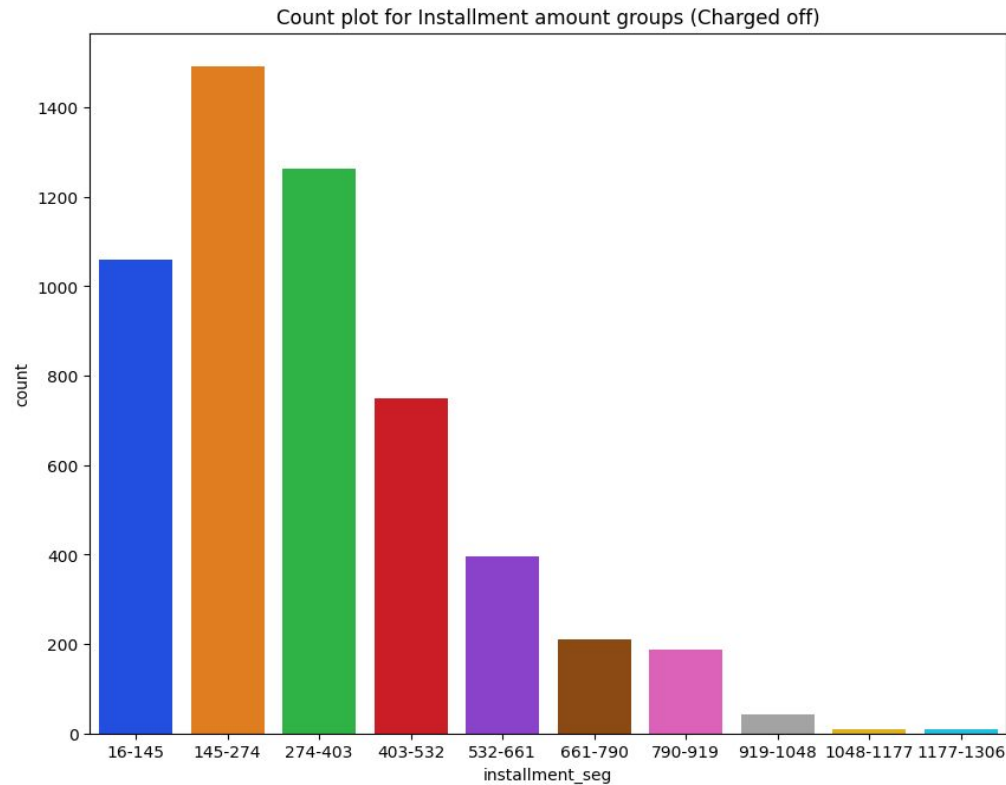
Loans with users paying around 145-274 dollars in installments considerable loans being charged off

Installments Account Group Countplot

Count plot for Interest rate (Charged off)
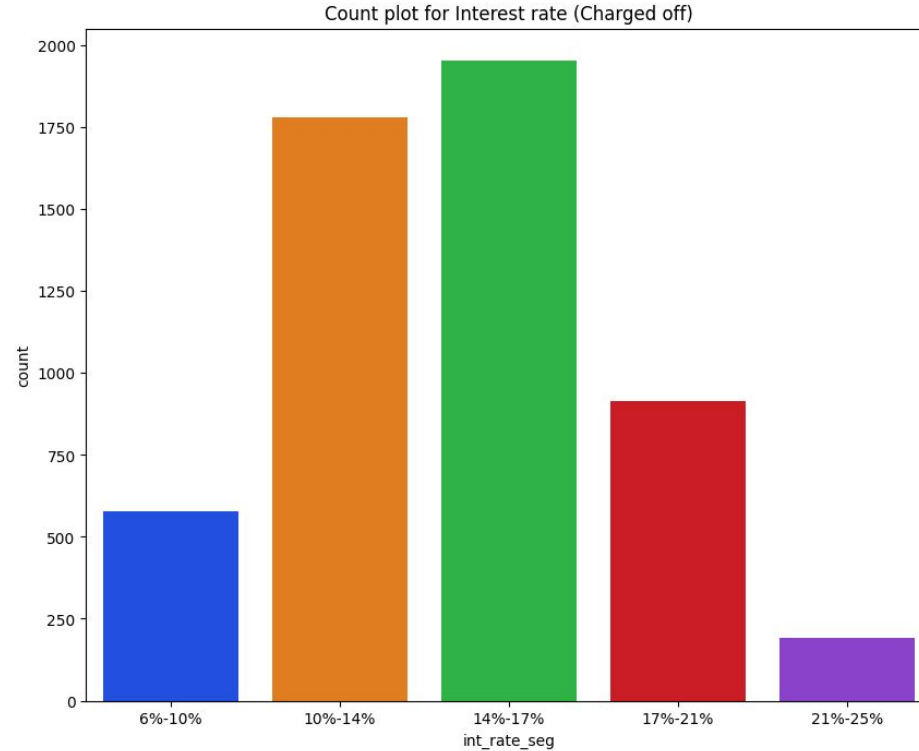
Loans with interest rates between 10% - 17% had higher number of charged off loans as compared to other loan interest rates

Loan Amount Group Countplot


Count plot for loan amount (Charged off)
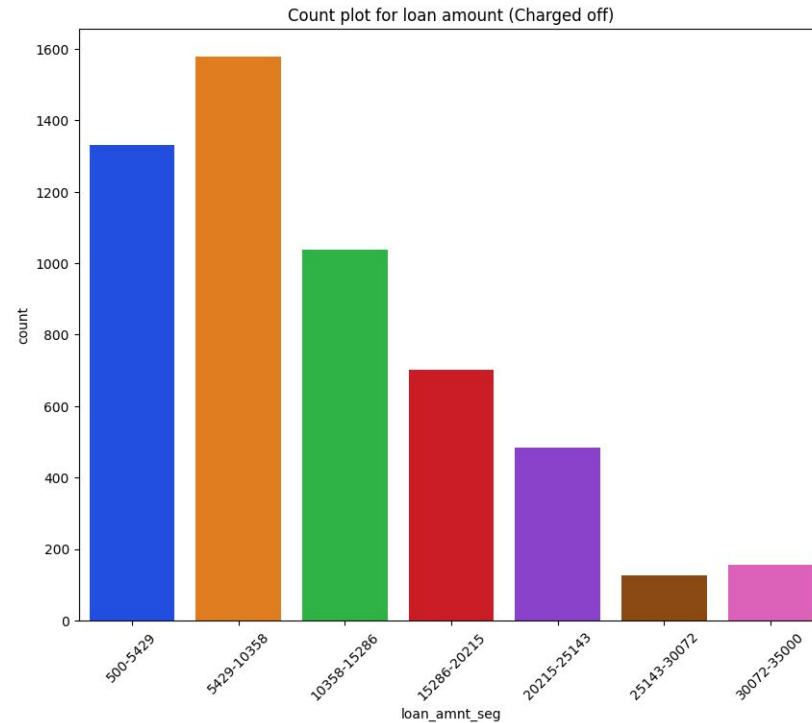
Loans with annual income of users being in the range 5429 - 10358 Dollars shown considerable number of charged off loans

Annual Income Group Countplot

Count plot for Annual Income (Charged off)
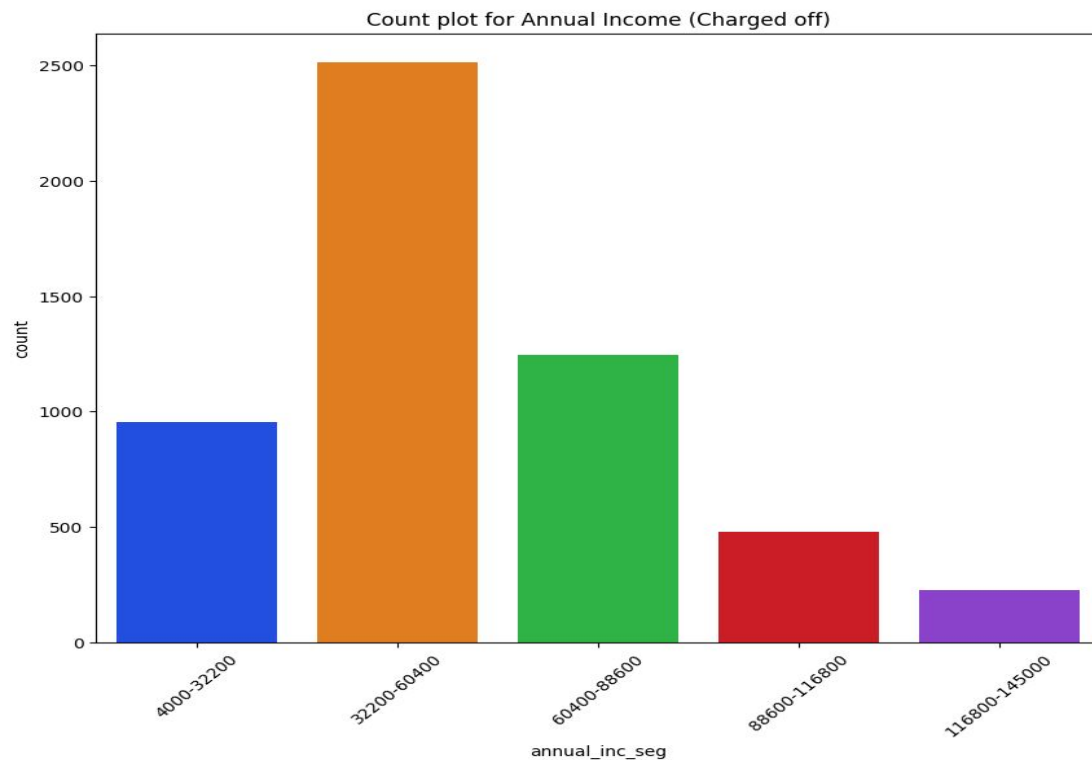
Individuals with annual income in the range 32200 - 60400 shown more charged off loans as compared to other groups

DTI(Debt to Income) Group Countplot

Count plot for Debt to Income Ratio (Charged off)
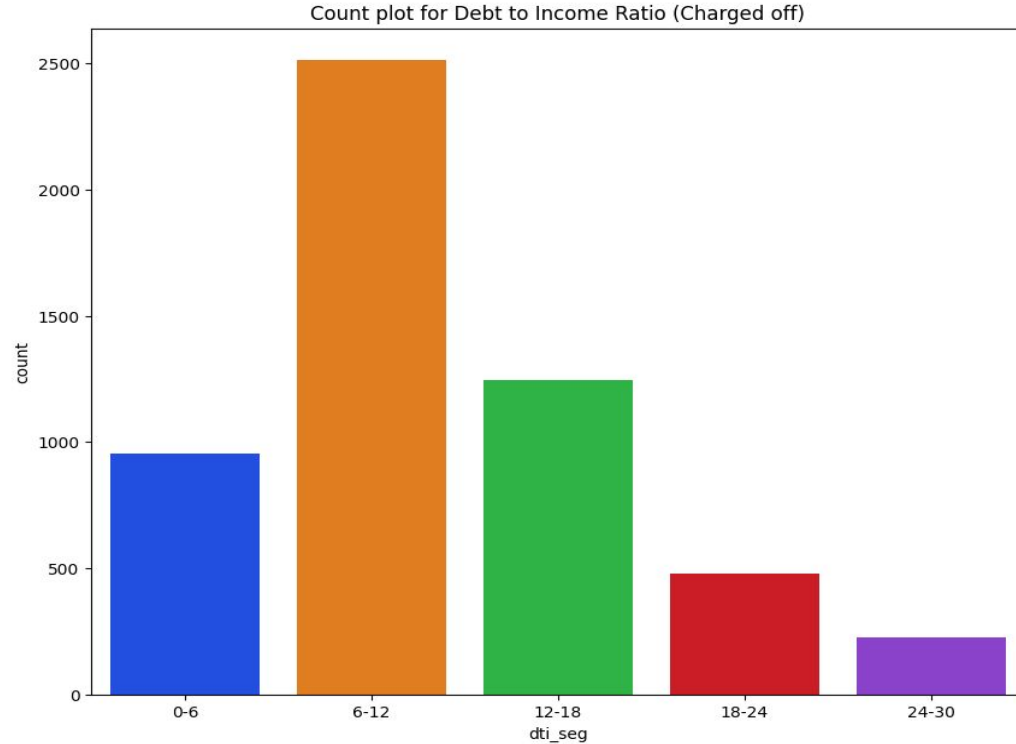
Dti of individuals with groups 6 - 12 have more charged off loans than compared to other dti groups

Open Credit Lines Countplot

Count plot for Open Credit lines (Charged off)
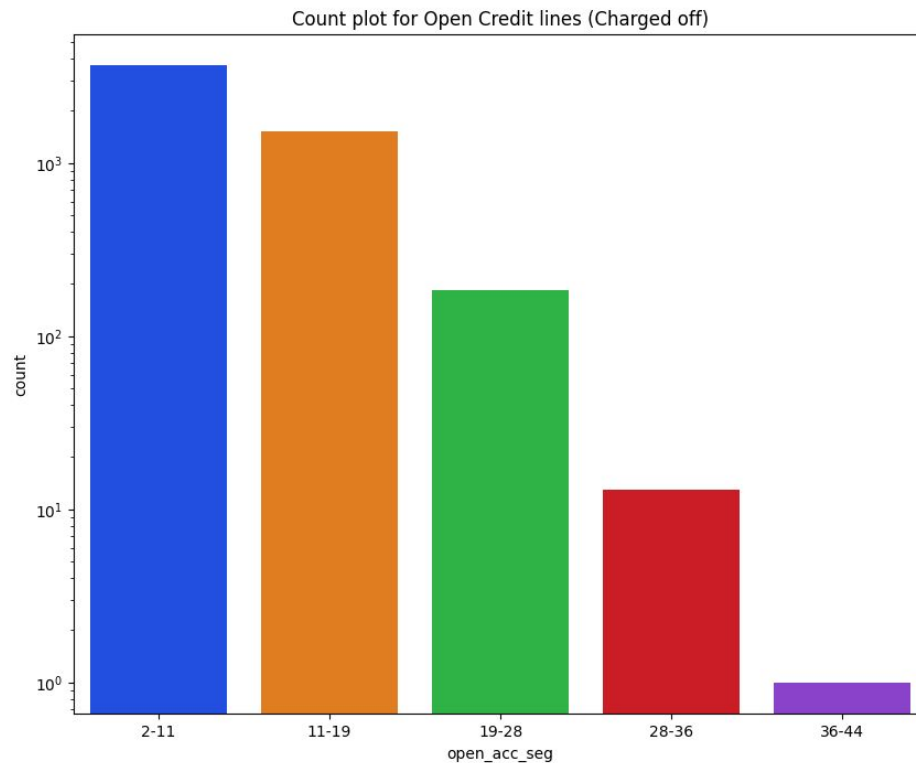
Individuals with 2-11 credit lines have higher number of charged off loans as compared to other open credit lines

Revol utilization Countplot

Count plot for Revolving utilization line rate (Charged off)
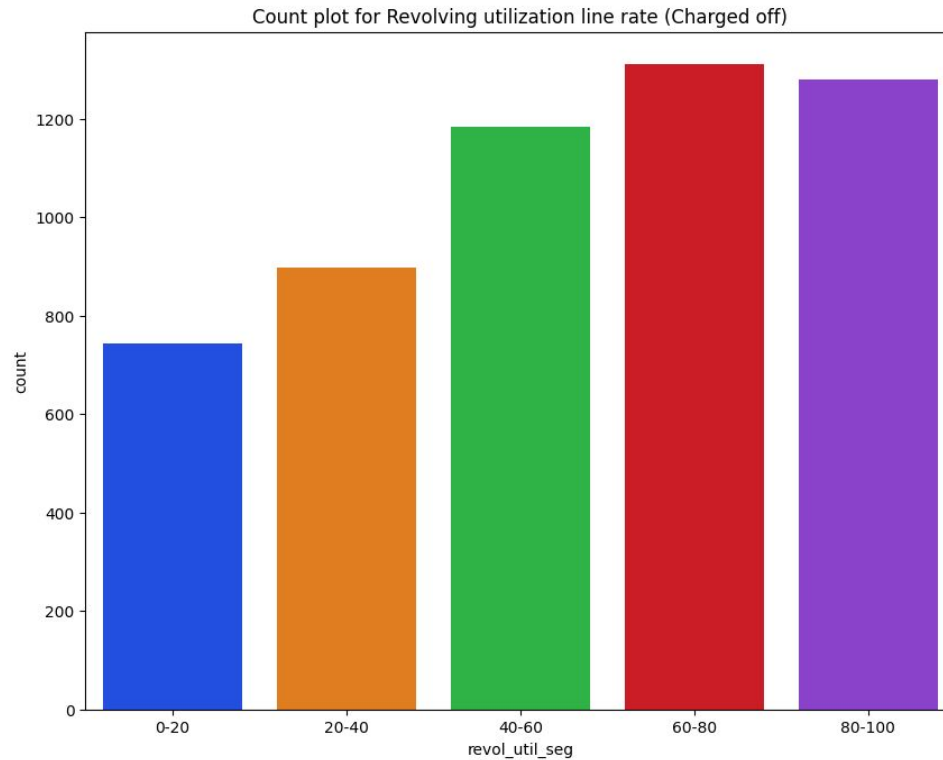
Individuals utilizing 60%-80% and 80%-100% of their revol balance showed higher charged off loans

Some Key Observations

Probability of Loans being charged off is more for the conditions:

Borrowers who has Loan term of 36 month

Borrowers whose income source is not verified

Borrowers who use their loans to repay other debts.

Borrowers who has long employment record like 10 years or above

Borrowers who took Grade B type loan with sub grade is 5

Borrowers who has home RENT to pay

Interest rate is in range of 14-17%

Loan amount is in between 5k-10k

Borrowers who has not gone under any inquiry in last 6 months

In 4th or early 1st Quarter of almost every financial year

Borrowers paying Installments around 145-270$

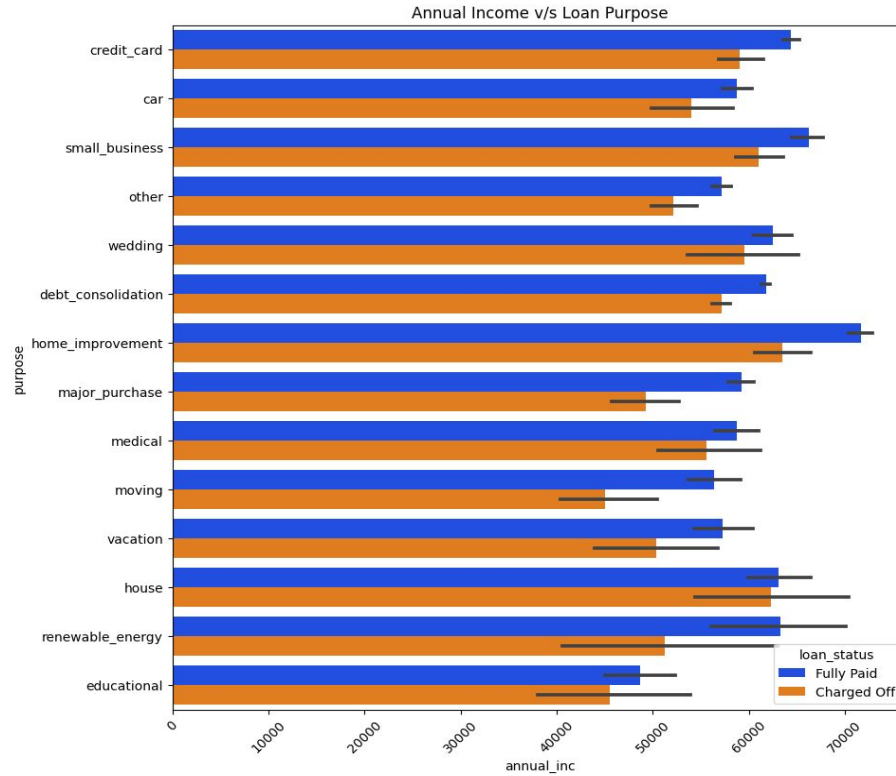Funded amount by Investors is in 4k-9k range

Borrower has Revolving line utilization rate in the range of 60-80

Annual Income is in range of 32k-60k
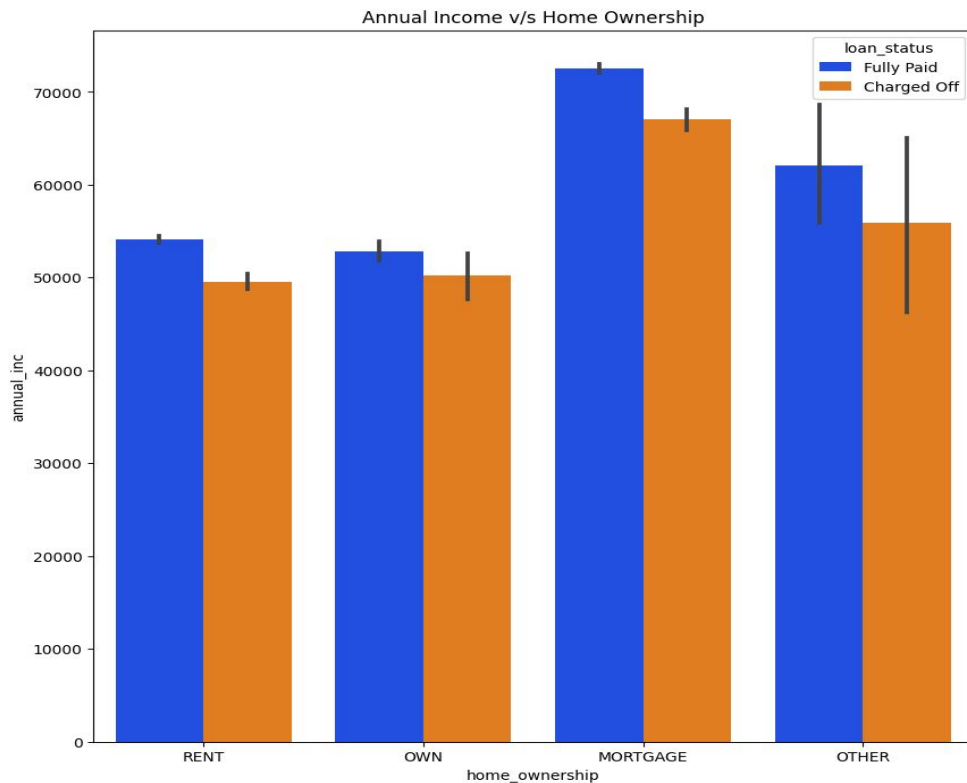
Debt to Income Ratio is in range of 6-12

Borrower has Open credit lines ranging from 2-11

Annual Income vs Loan Purpose

Annual Income v/s Loan Purpose

Loan for Housing purpose has higher ratio of charged off loan as compared to fully paid loan
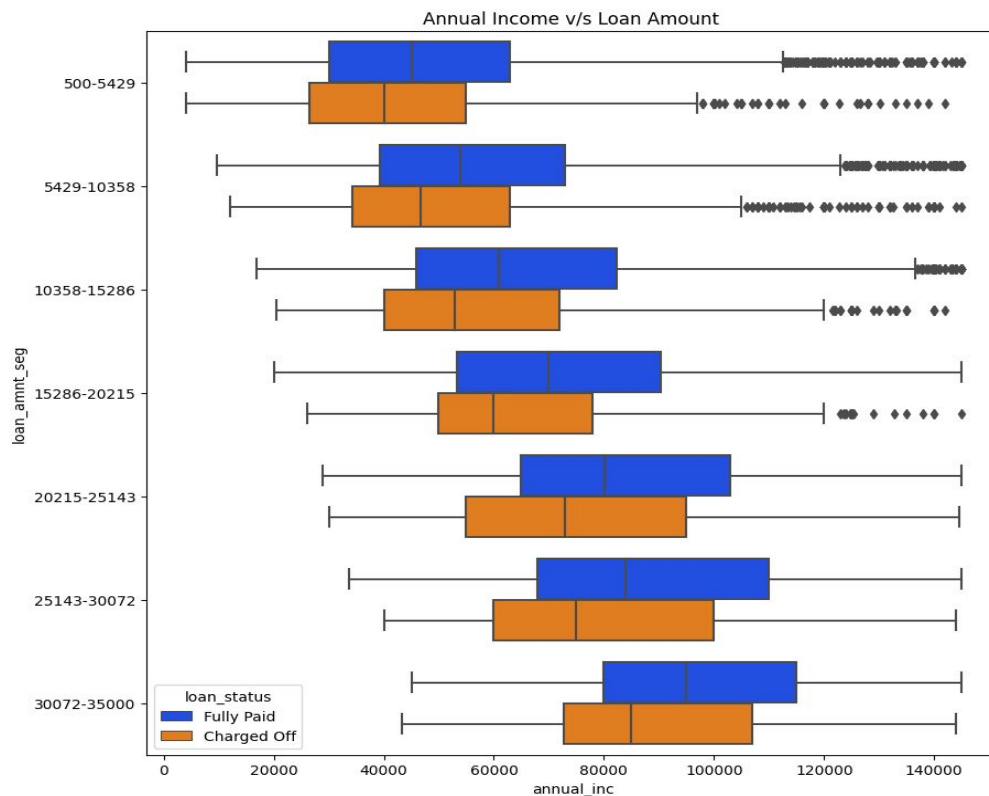
Annual Income vs Home Ownership

Individuals taking loan for mortgage purposes have on average higher annual income while people having their own homes are at higher risk for loan being charged off
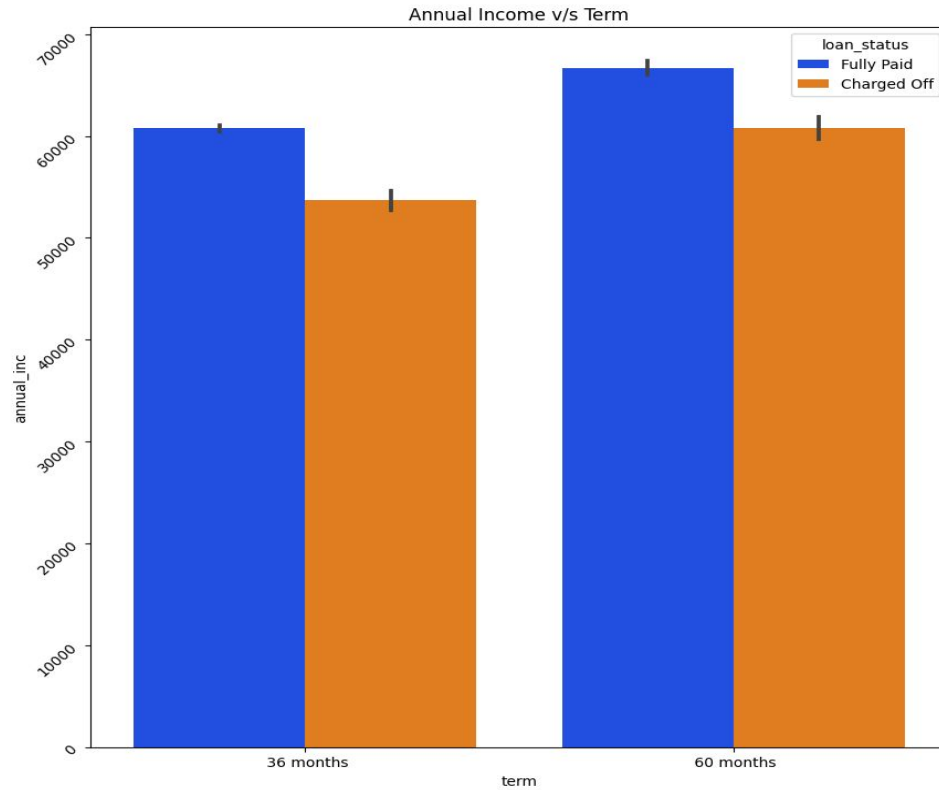
Annual Income vs Home Ownership

Annual Income v/s Gade (Charged off)
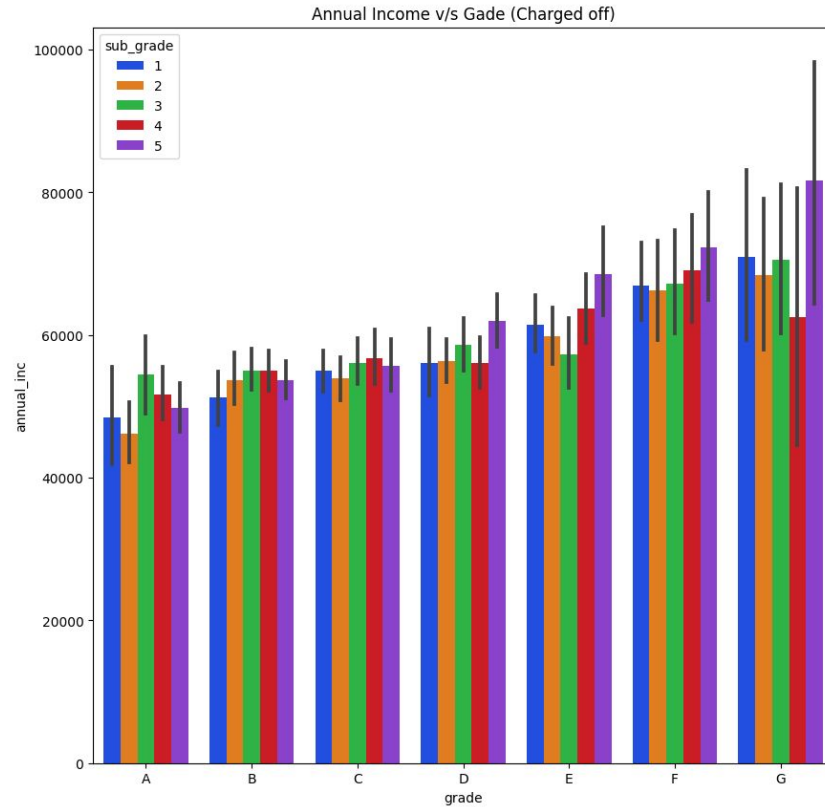
Loan subgrade 5 for any loan grade is at higher risk for loan being charged off majority of times.
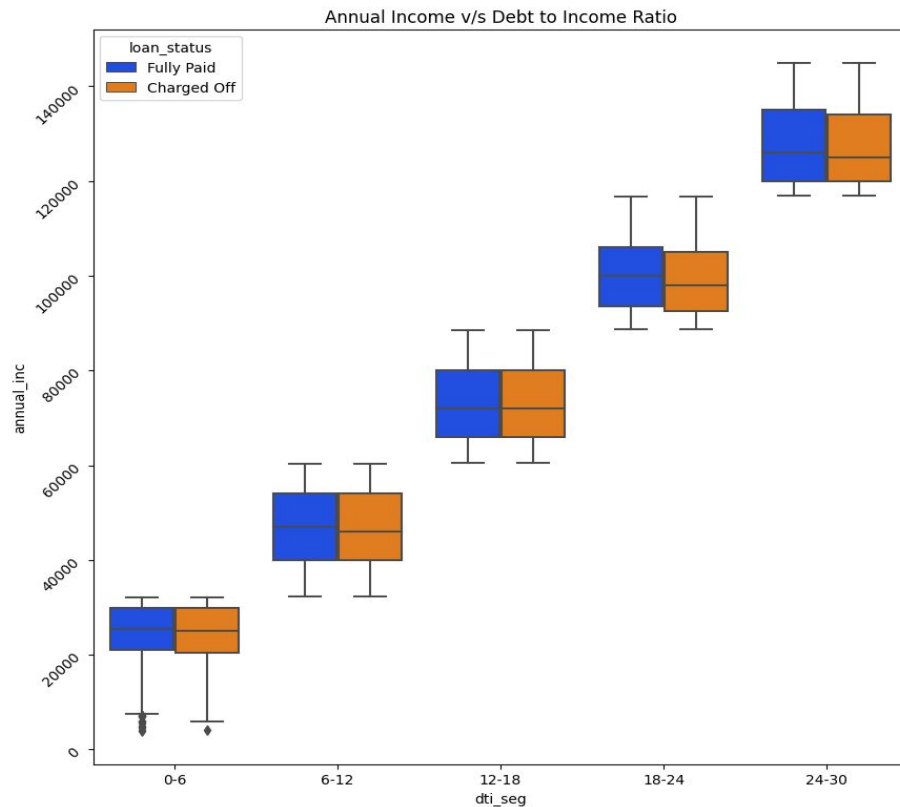
Annual Income v/s Loan Amount

With an increase in the annual income the loan income is also increases
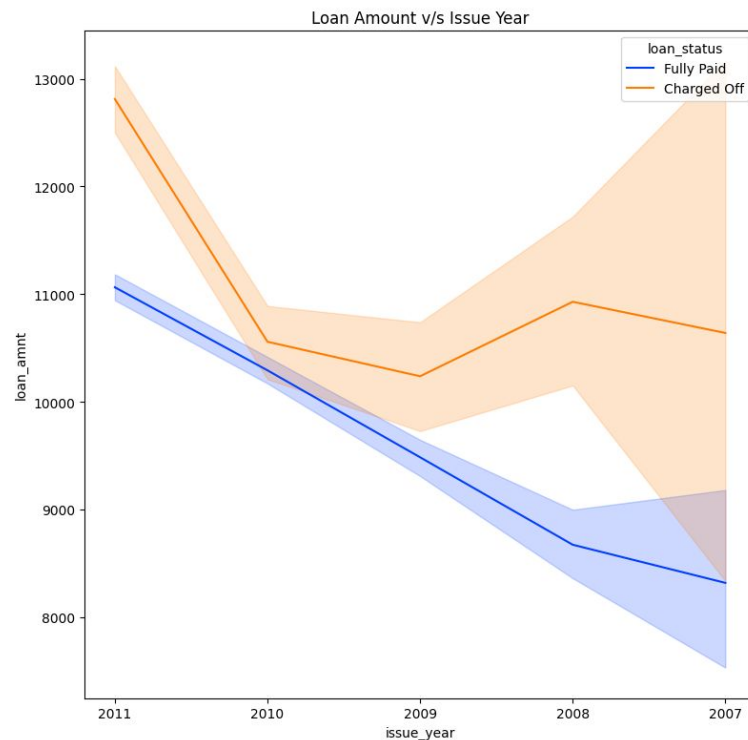
Annual Income vs Home Ownership
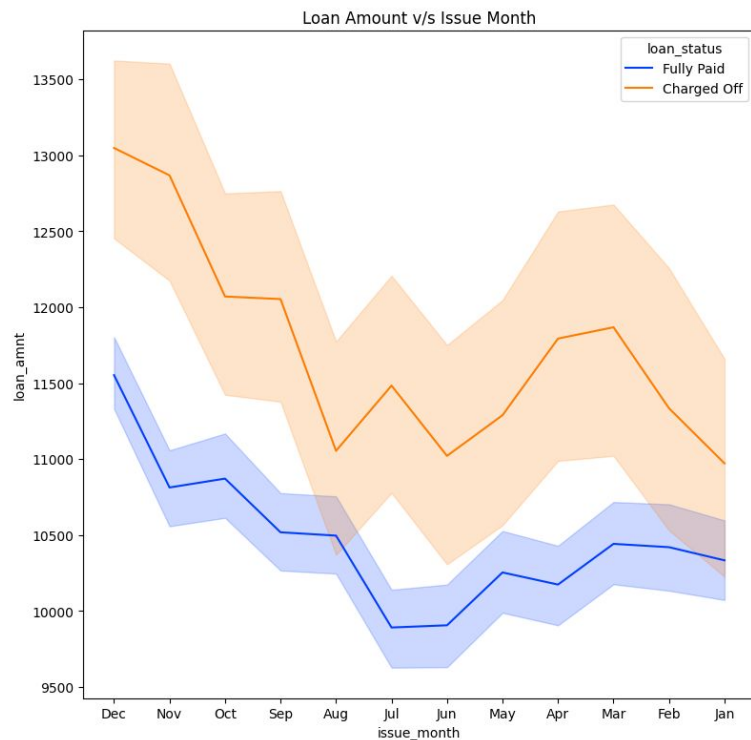

Loan with tenure of 60 months are at higher risk of getting charged off.

Annual Income vs DTI(Debt to Income ratio)

Annual Income v/s Debt to Income Ratio

With an increase in the dti, the annual income increases too. Also, individuals with less income have less dti as compared to its counterpart
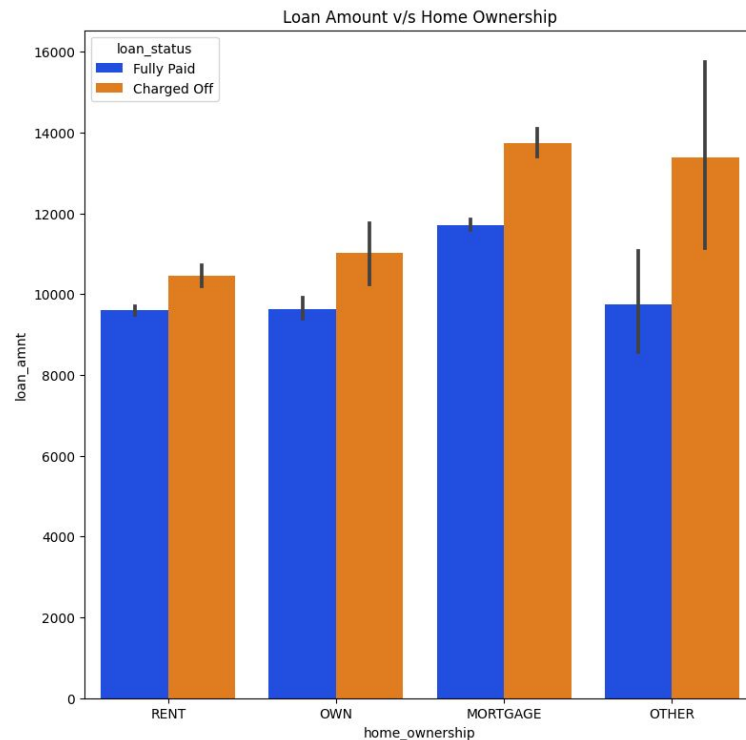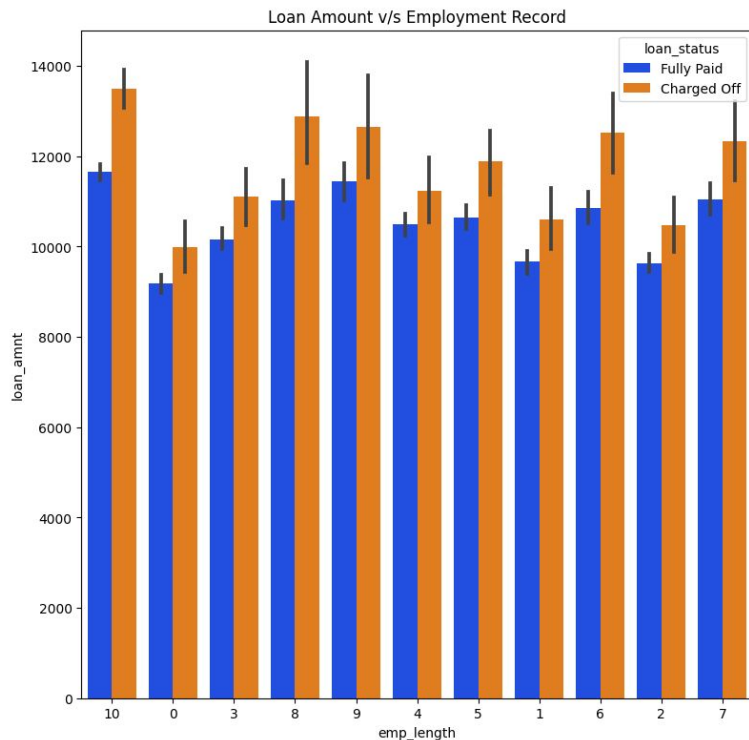
Loan Amount vs Issue Month and Year

December on an average sees higher loans getting charged off with loan amount varying between 12500 - 13500 dollars.

**Years like 2011 sees on an average larger loans getting charged off than previous years**

Loan Amount vs Tenure and Home Ownership

Employees with tenure as 10 years usually takes loans of higher amount and the risk is also low as compared to other tenure
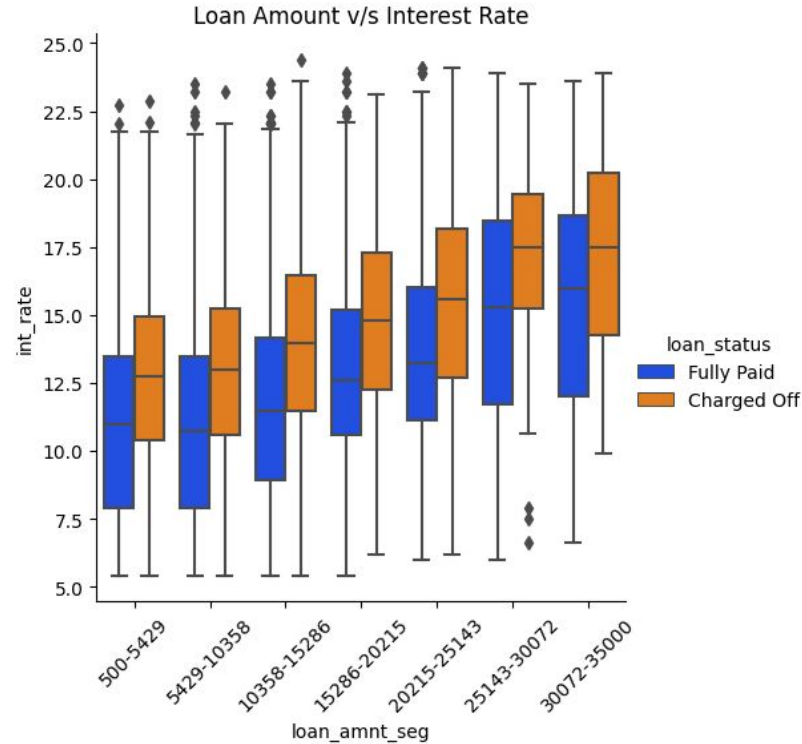
Loans for Individuals living on rent usually have a higher chance of getting defaulted as compared to others

Loan Amount vs Loan Purpose

Loan Amount v/s Loan Purpose
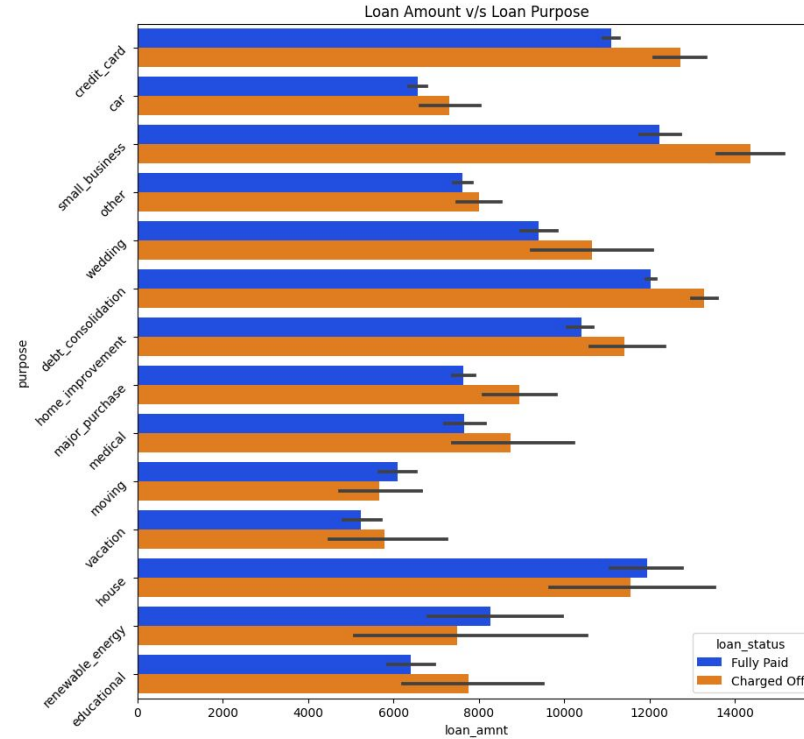
Small Businesses usually sees people taking higher loan amount and it comes with a higher risk of getting defaulted as well

Loan Amount vs Interest Rate

Loan Amount v/s Interest Rate

As the loan amount increases the interest rate also increases, the median value of the interest rate for the two highest segments of loan amount i.e. 25143-30072 and 30072 - 35000 is almost same

Grade vs Interest Rate
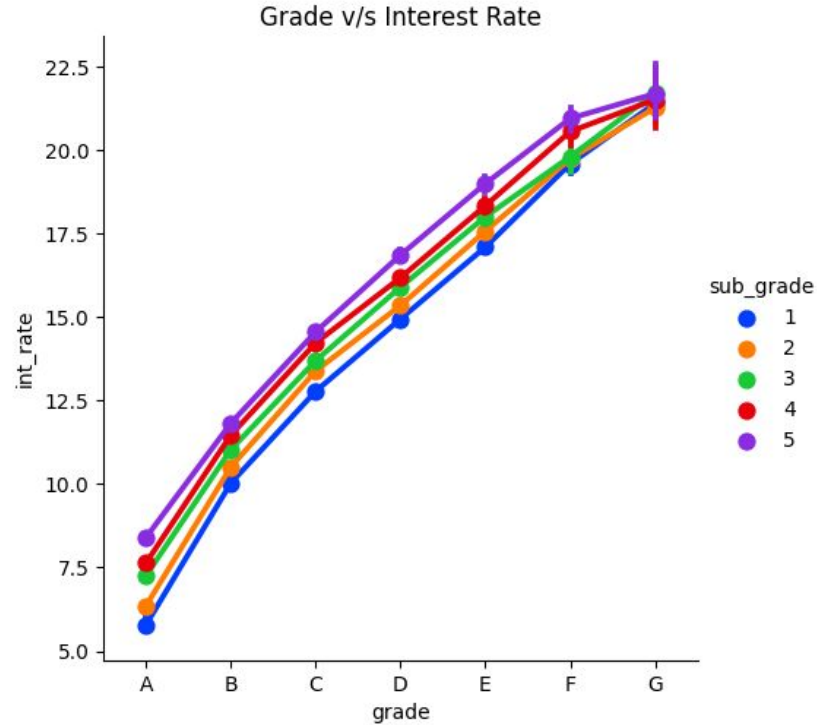
With increase in the loan grade, the interest rate also sees a steady increase and the loan subgrade 5 having higher interest rate in almost all the loan grades

Some Key Observations

Probability of Loans being charged off is more for the conditions:

- Borrower having Annual income around 60k-70k takes the loan for Home Improvement although risk is significantly reduces when the Annual income of borrower exceeds above 70k.
- The interest rate applied for the loan is around 21-25% and borrower falls under the Income range of 70k-80k, Although above 80k the risk is low.
- Borrowers having Home Mortgage with the income range of 60k-70k
- Borrowers with loan amount 30k-35k with income near to 80k although with income closely around 100k the risk factor reduce significantly.
- In the 4th Quarter of the year with the loan amount ranging from 12k-13k although Loan amount below 12k in this period significantly lower the risk.
- Year on Year when loan amount increase over 11k and the risk is lowering below 11k and also the risk threshold is increasing steadily year on year as the number of fully paid loans are increasing which is good sign.
- Small Business take loan greater than 14k although it can be managed by reducing the loan amount around 12k to lower the default risk.
- Borrower with employment record of 10 years take loan of 12k-14k
- Borrower with Home Mortgage took the loan above 14k although the risk reduces with the reduction of loan amount below 12k
- loan grade is F4 or F5 and the loan amount taken is in the range of 15k-20k
- loan amount of 30k-35k taken on the interest of 15%-17.5% but by lowering the interest rate below 15% defaulting risk can be reduced.
- The interest rate ranging from 20%-23% applied over the 'G' type Loan Grade