LENDING CLUB CASE STUDY

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CONTENTS

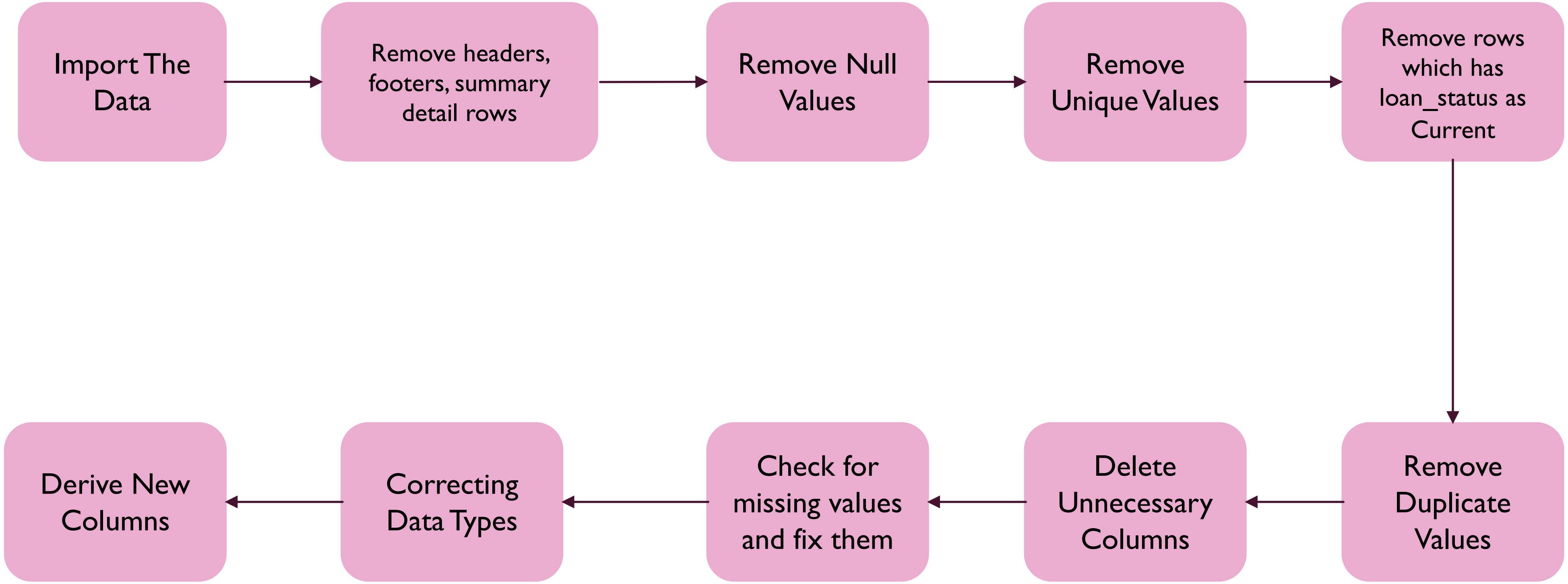
PROBLEM STATEMENT

- A Consumer Finance Company which specializes in lending various types of loans to urban customers aims to minimize the financial losses caused by loan defaults.
- Financial losses (also called as credit loss) is the amount of money lost by the lender when the borrower refuses to pay or runs away with the money owned.
- In other words, borrowers who are marked as "Charged-off" are the ones responsible for financial losses.
- The main objective of this case study is to understand the strong indicators behind loan default, so company can reduce their financial losses.

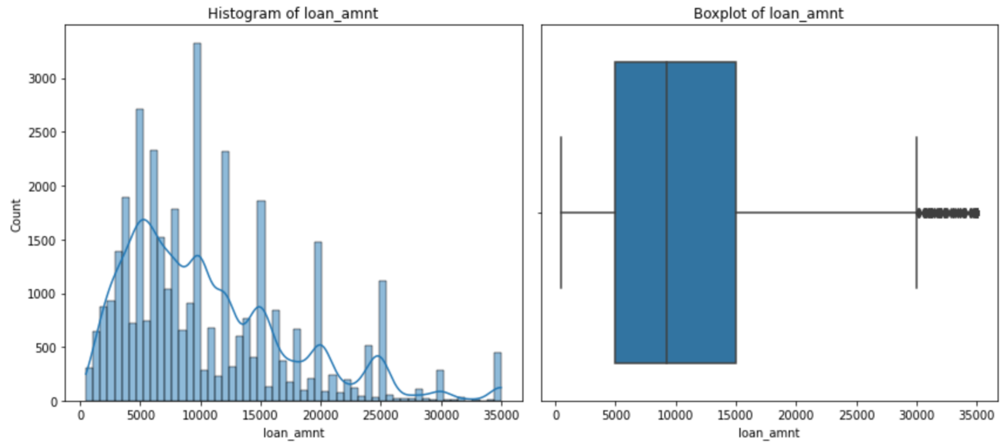
ANALYSIS APPROACH

- Data Understanding
  - Analyze the whole data to understand its structure, variables and distributions.
  - Data cleaning.
  - Data conversion.
- Univariate Analysis
  - Analyze individual variables to identify patterns and outliers.
- Bivariate Analysis
  - Analyze relationships between multiple variables. Specially between all variables to loan "charged off" status.
- Insights
  - Final observations concluded from above steps.

DATA UNDERSTANDING PROCESS

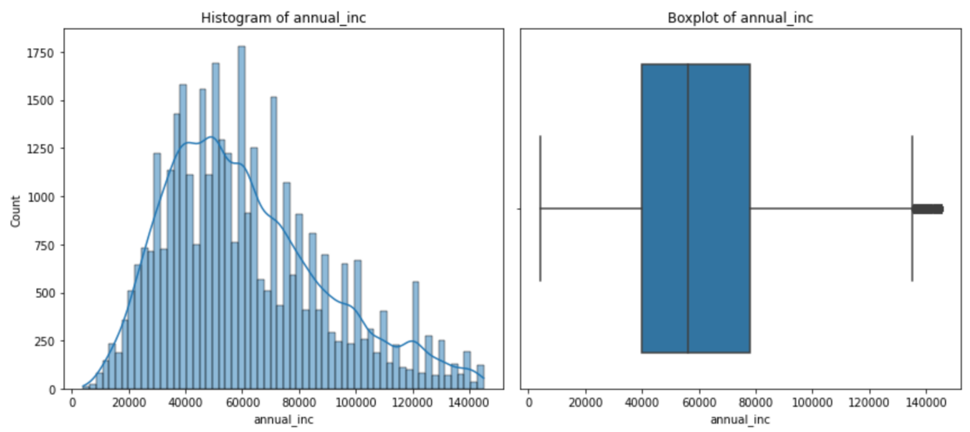


UNIVARIATE ANALYSIS – LOAN AMOUNT



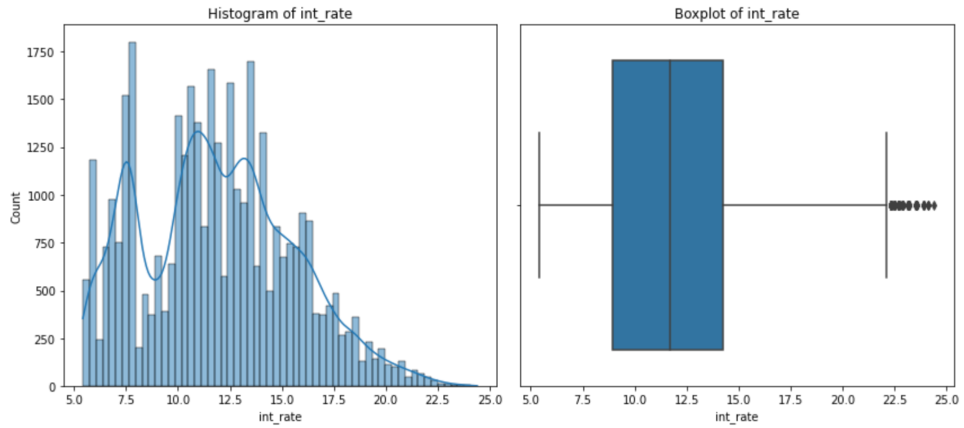
- The data appears to be positively skewed, as the mean is greater than the median (50th percentile). The majority of the loan amounts fall between 5,000 and 15,000, with some larger loans reaching up to 35,000. The standard deviation indicates that there is variability in loan amounts, with some loans being substantially higher or lower than the mean.

UNIVARIATE ANALYSIS – ANNUAL INCOME



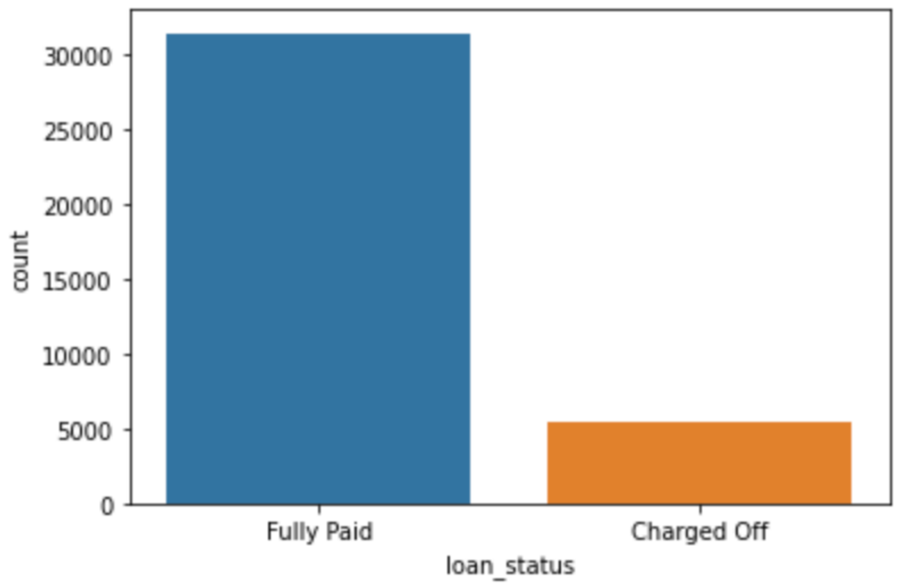
- The data appears to be positively skewed, as the mean is greater than the median (50th percentile). The majority of the values fall between 40,000 and 78,000, with some larger values reaching up to 145,000.

UNIVARIATE ANALYSIS – INTEREST RATE



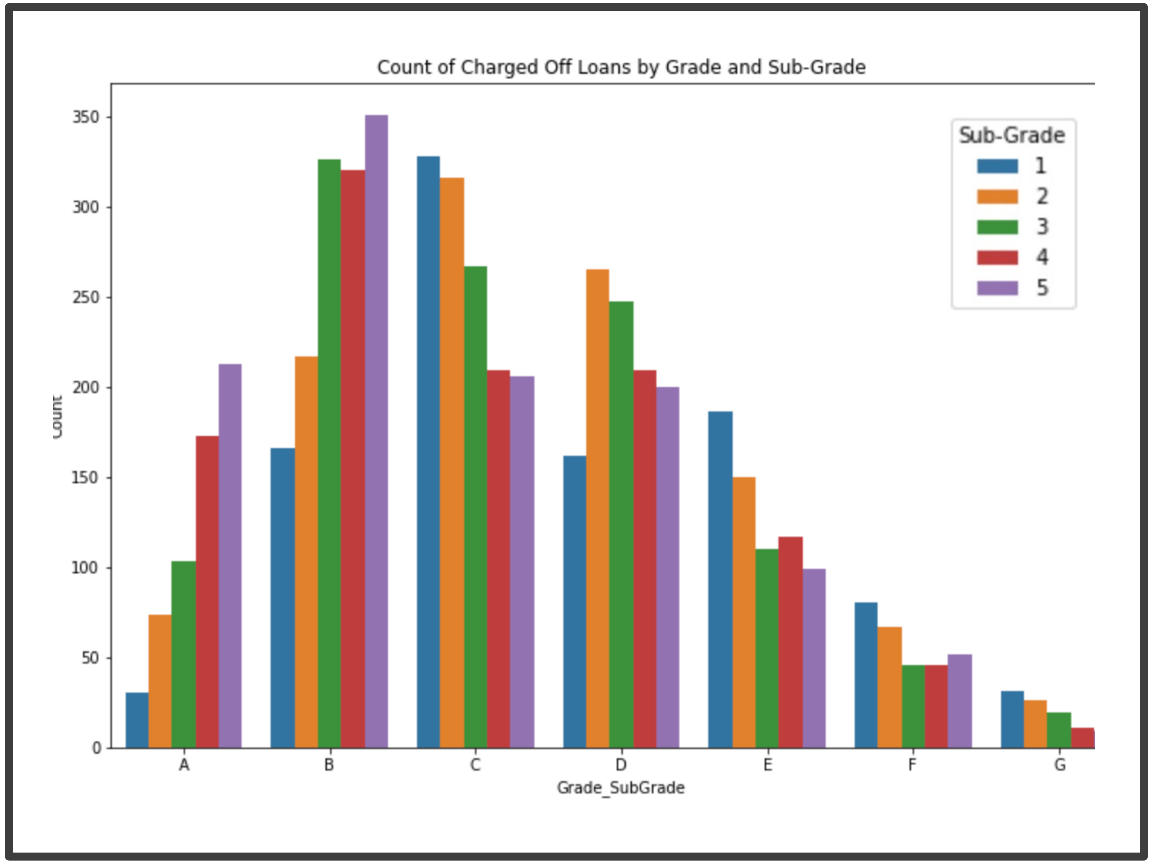
- The data appears to be relatively normally distributed, as the mean and median are close to each other. The majority of the values fall between approximately 8%-14%.

UNIVARIATE ANALYSIS – LOAN STATUS



- The "Charged Off" borrowers are around 15% and "Fully Paid" borrowers are around 85%.

UNIVARIATE ANALYSIS – GRADE & SUB-GRADE

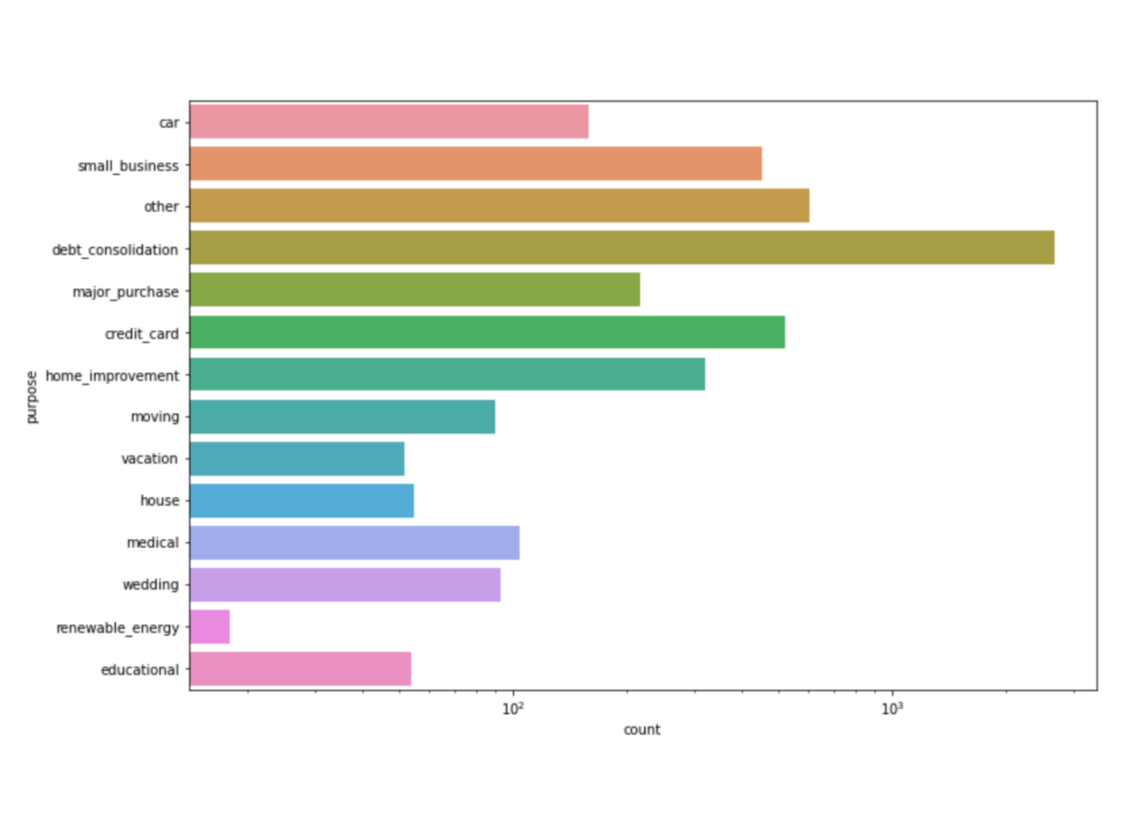


- The analysis with respect to the charged off loans for **grade and sub_grade** suggests the following. There is a more probability of defaulting when
  - Grade is 'B'
  - Total Grade of 'B5' level

UNIVARIATE ANALYSIS – HOME OWNERSHIP

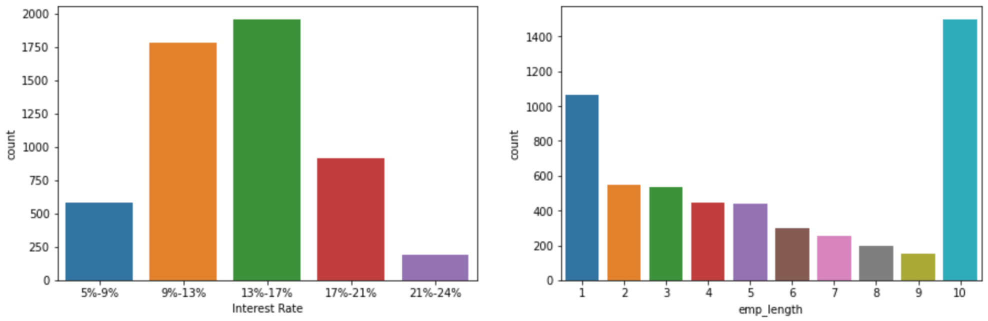
- There are only 3 records with ‘NONE’. Hence replaced with ‘OTHER’.
- The analysis with respect to the charged off loans for **home_ownership** suggests the following. There is a more probability of defaulting when
  - Applicants having house_ownership as 'RENT'

UNIVARIATE ANALYSIS – PURPOSE



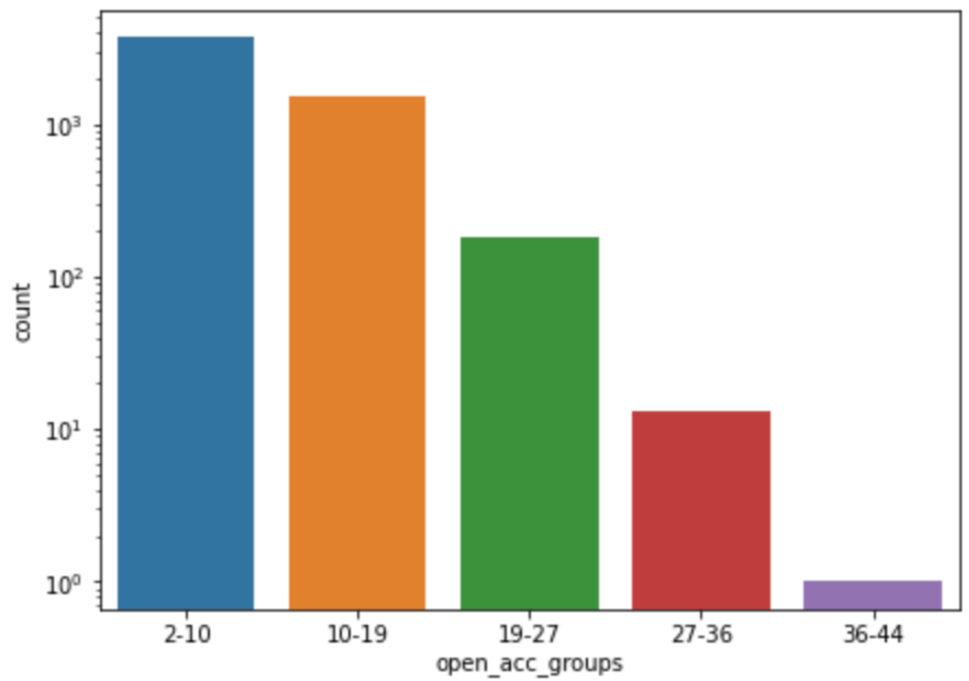
- The analysis with respect to the charged off loans for **purpose** suggests the following. There is a more probability of defaulting when
  - Applicants who use the loan to clear other debts

UNIVARIATE ANALYSIS – INTEREST RATE



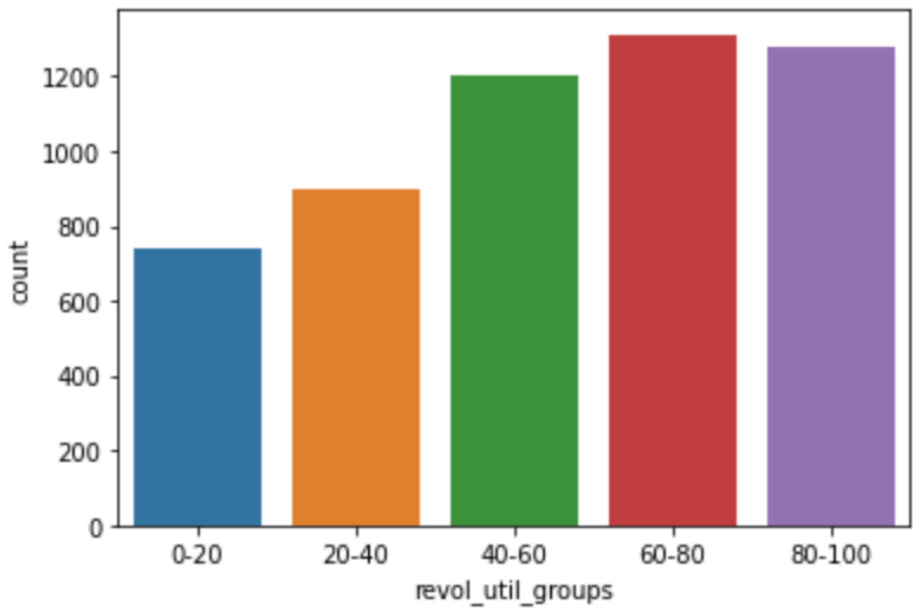
- Analyzing interest rate wrt the interest rate bins created
- The below analysis with respect to the charged off loans for *Interest_Group and Emp_length* suggests the following. There is a more probability of defaulting when
  - Applicants who receive interest at the rate of 13-17%.
  - Applicants with employement length of 10

UNIVARIATE ANALYSIS – OPEN_ACC



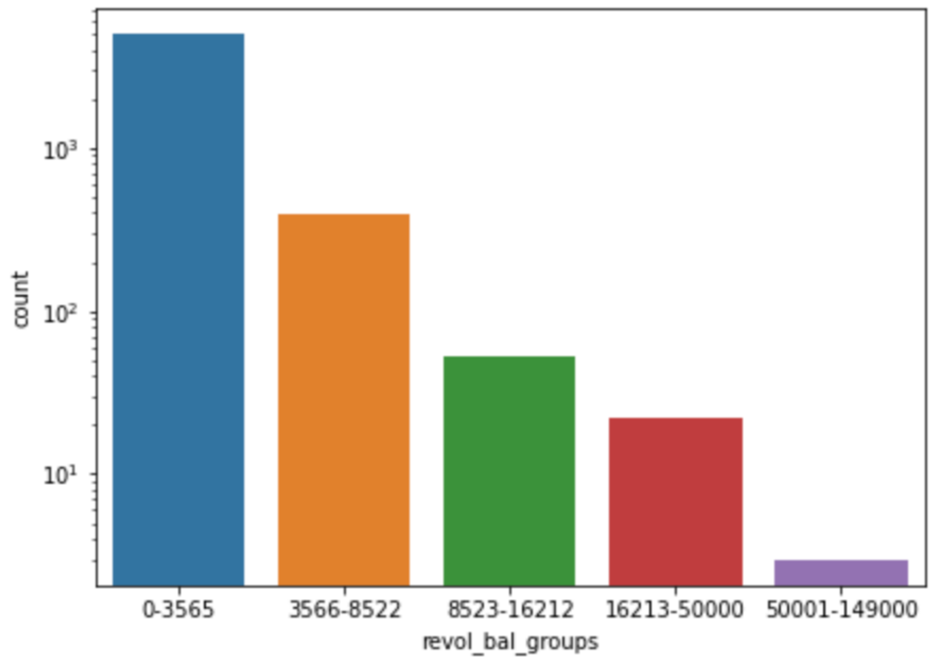
- The below analysis with respect to the charged off loans for *Open Account Group* suggests the following. There is a more probability of defaulting when
  - Applicants who have 2-10 open accounts

UNIVARIATE ANALYSIS – REVOL_UTIL_GROUPS



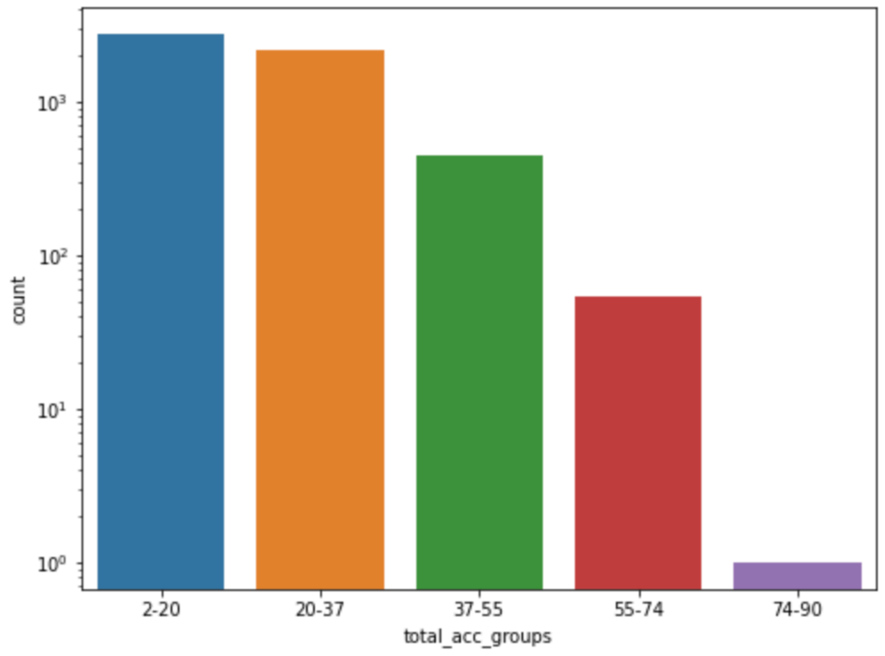
- The below analysis with respect to the charged off loans for *Revolving line utilization rate group* suggests the following. There is a more probability of defaulting when
  - Applicants who are having 60-80% utilization rate

UNIVARIATE ANALYSIS – REVOL_BAL_GROUPS



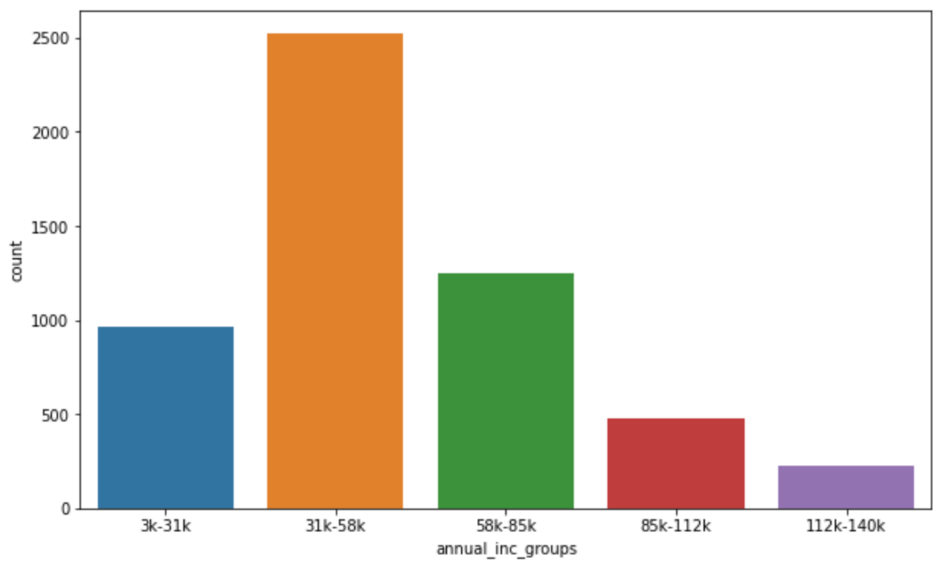
- The below analysis with respect to the charged off loans for *Revolving Balance Group* suggests the following. There is a more probability of defaulting when :
  - Applicants who have Revolving Balance in the range of 0-3565

UNIVARIATE ANALYSIS – TOTAL_ACC_GROUPS



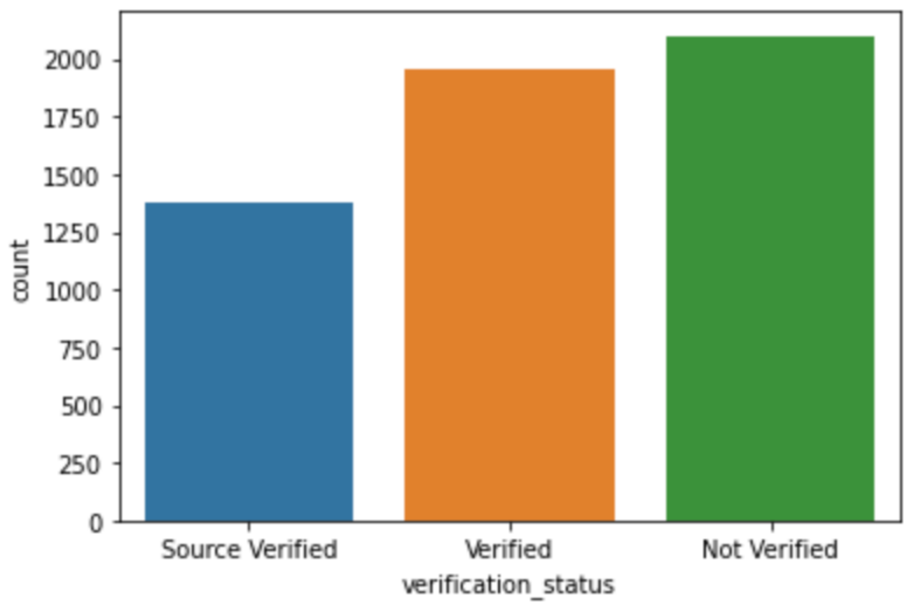
- The below analysis with respect to the charged off loans for *Total acc/Total credit lines group* suggests the following. There is a more probability of defaulting when
  - Applicants who have credit lines in 2-20 range

UNIVARIATE ANALYSIS – ANNUAL_INC_GROUPS



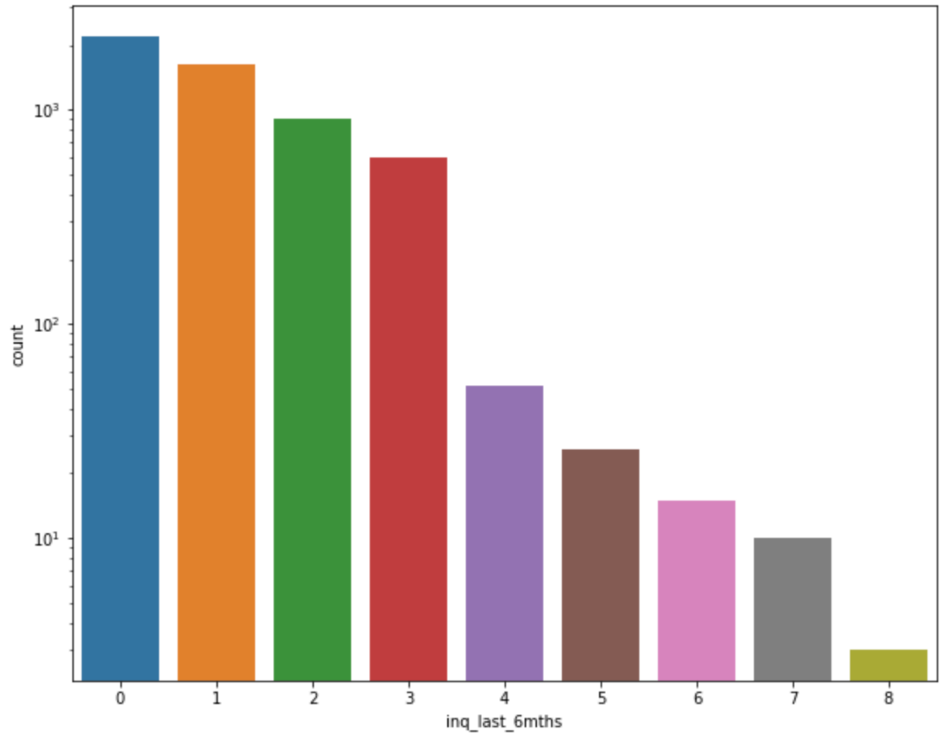
- The below analysis with respect to the charged off loans for *Annual Income Group* suggests the following. There is a more probability of defaulting when
  - Applicants who have an income of range 31k-58k

UNIVARIATE ANALYSIS – VERIFICATION_STATUS



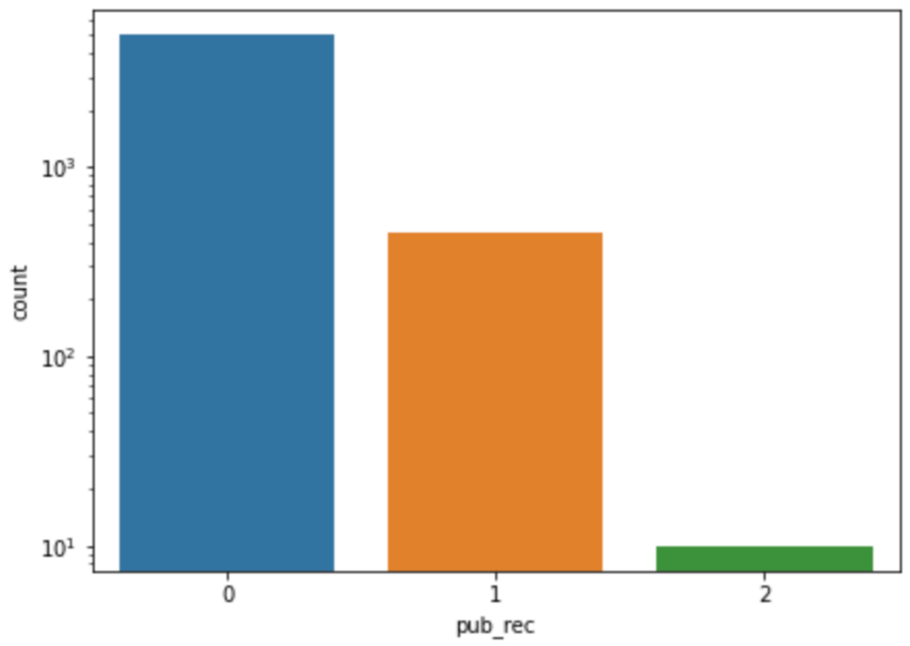
- The below analysis with respect to the charged off loans for *Verification Status* suggests the following. There is a more probability of defaulting when
  - Applicants when verification status says Not Verified

UNIVARIATE ANALYSIS – INQUIRIES IN PAST 6 MONTHS



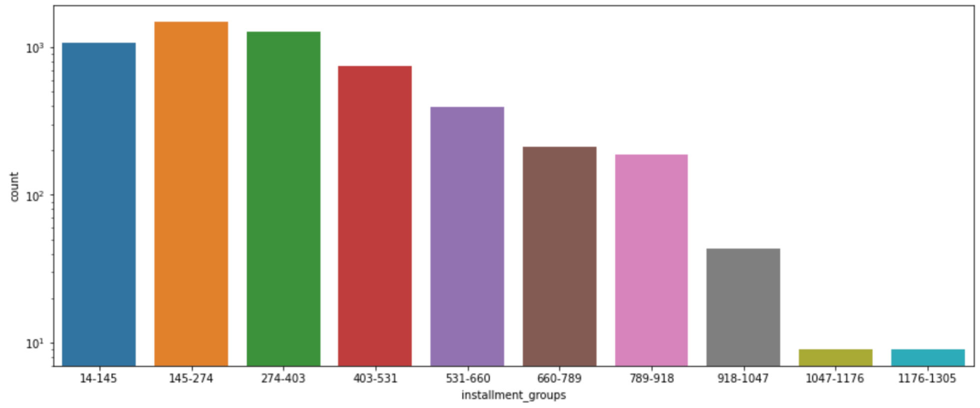
- The below analysis with respect to the charged off loans for *inquiries in past 6 months* suggests the following. There is a more probability of defaulting when
  - Number of enquiries in last 6 months is 0

UNIVARIATE ANALYSIS – DEROGATORY PUBLIC RECORDS



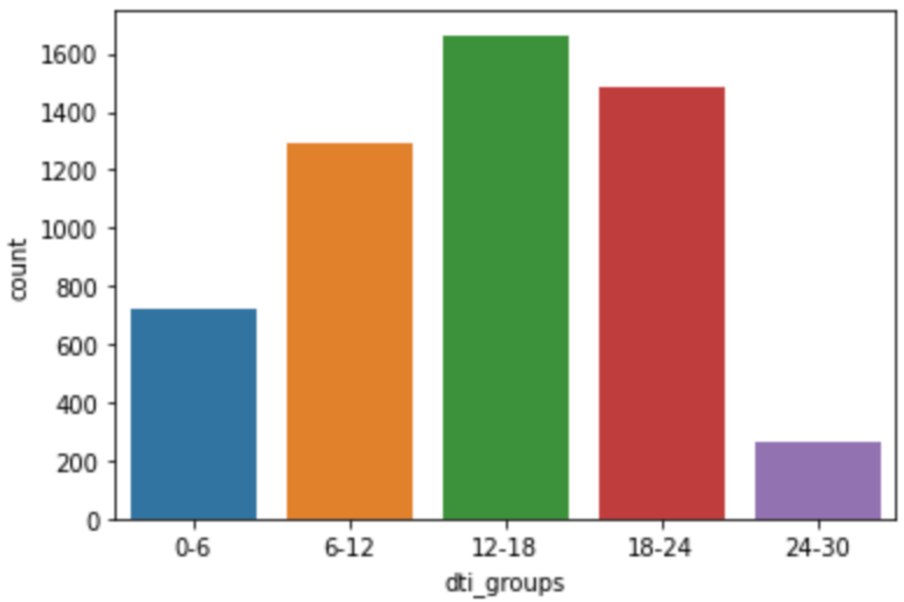
- The below analysis with respect to the charged off loans for *derogatory public records* suggests the following. There is a more probability of defaulting when
  - Number of derogatory public records is 0

UNIVARIATE ANALYSIS – INSTALLMENT GROUPS



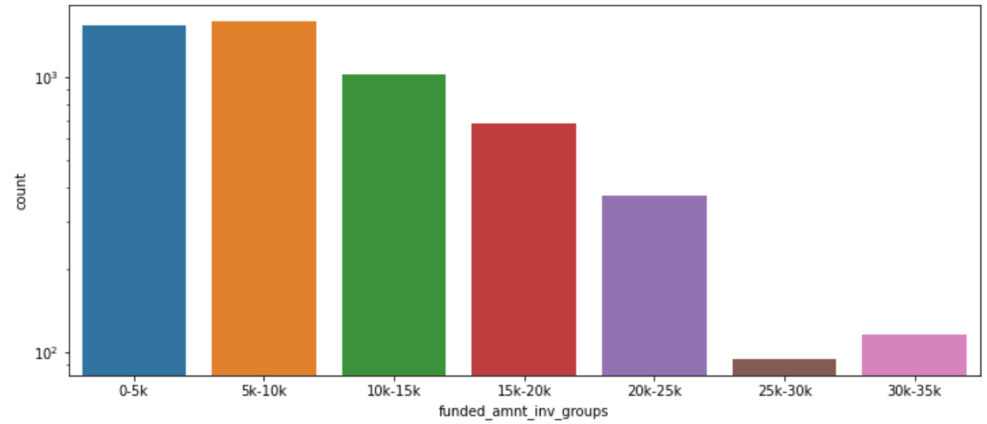
- The below analysis with respect to the charged off loans for *Installment Group* suggests the following. There is a more probability of defaulting when
  - When monthly installments are between 145-274

UNIVARIATE ANALYSIS – DTI GROUPS



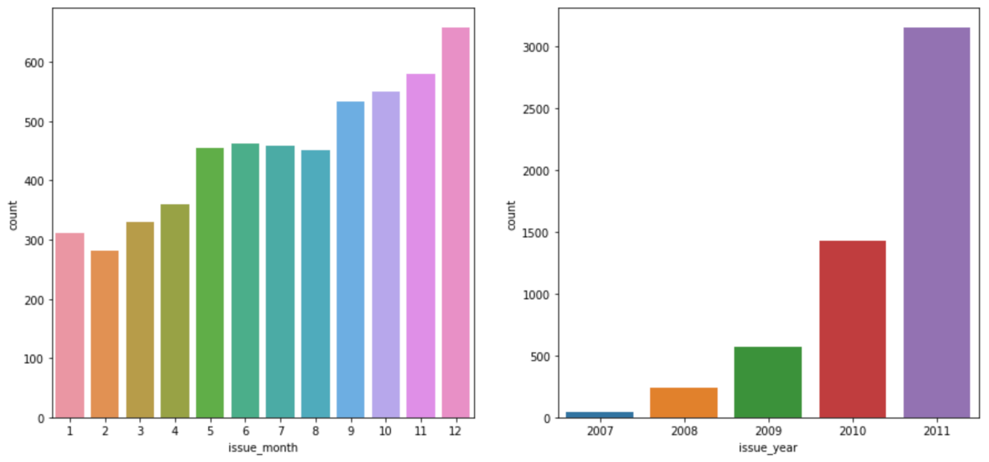
- The below analysis with respect to the charged off loans for *DTI group* suggests the following. There is a more probability of defaulting when
  - Applicants DTI ratio is in 12-18 range

UNIVARIATE ANALYSIS – FUNDED AMOUNT_INV GROUP



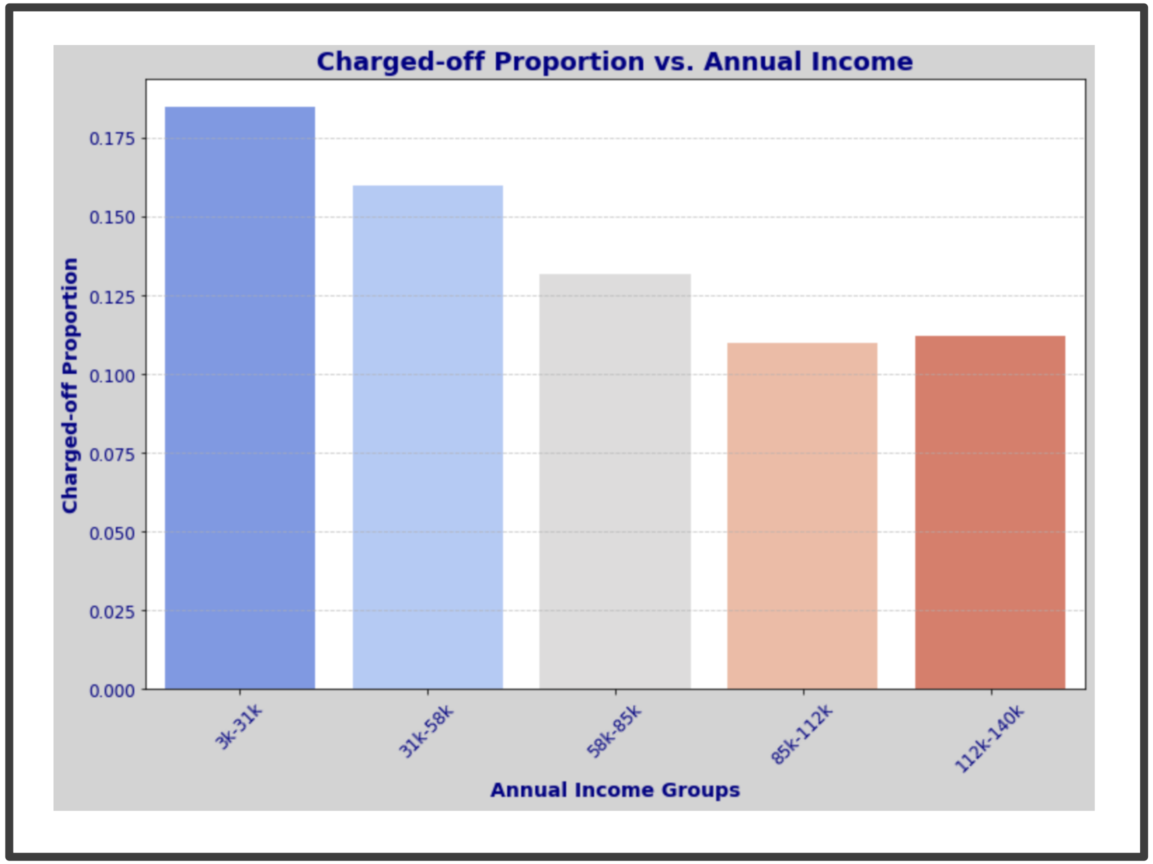
- The below analysis with respect to the charged off loans for *Funded amount_inv Group* suggests the following. There is a more probability of defaulting when
  - When funded amount by investor is between 5k-10k

UNIVARIATE ANALYSIS – ISSUED MONTH & YEAR



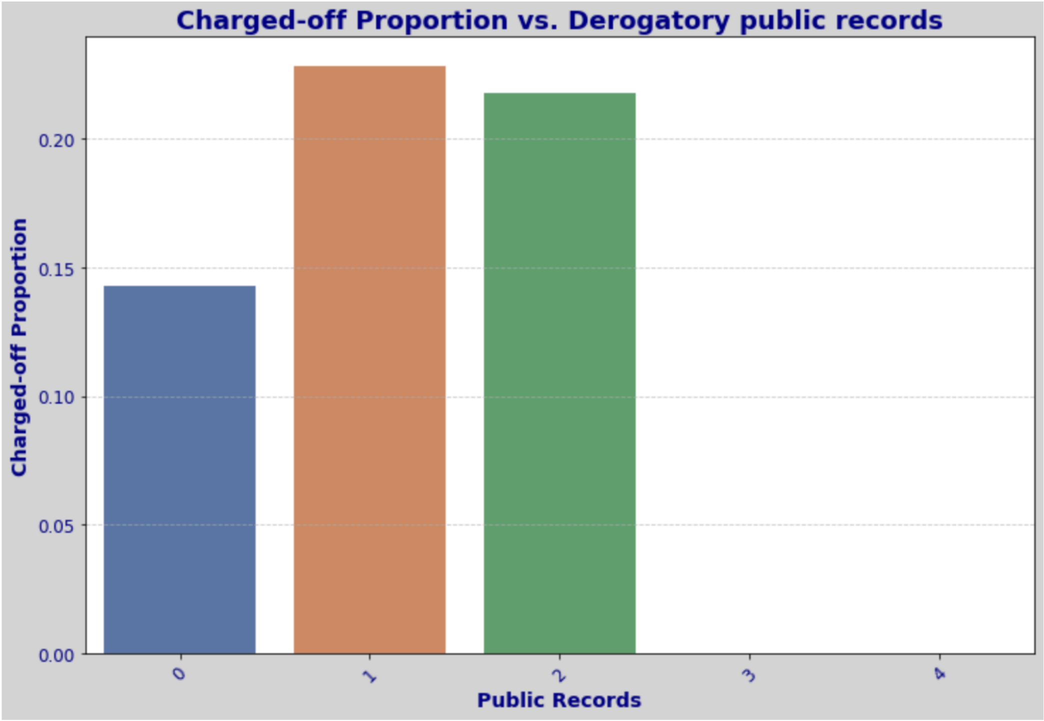
- The below analysis with respect to the charged off loans for *issue_month and issue_year* suggests the following
  - Maximum number of defaults occured when the loan was sanctioned/issued in Dec(12)
  - Loan issued in the year
    - *Maximum Defaults in December (Issue Month 12):* The analysis indicates that the highest number of loan defaults occurred when loans were issued in December. This suggests a potential correlation between loans issued during the holiday season and a higher likelihood of default. Possible reasons might include increased spending during the holidays, financial strain, or other seasonal factors affecting borrowers' ability to repay.
    - *Loans Issued in 2011 (Issue Year):* Another notable observation is that a significant number of defaults were associated with loans issued in the year 2011. This could indicate specific economic conditions or lending practices prevalent during that period that may have contributed to a higher default rate.

BIVARIATE ANALYSIS



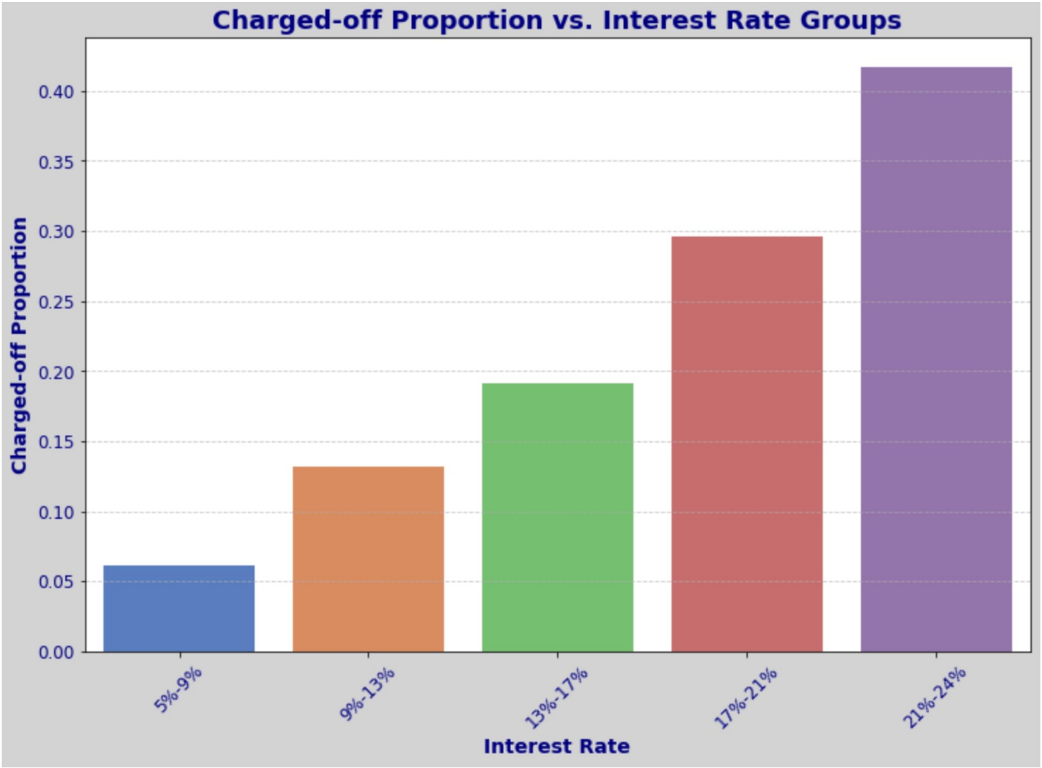
- **Charged-off Proportion vs. Annual Income**
- **OBSERVATIONS:**
  - Income range 85000+ has less chances of charged off.
  - Income range 3k-31k has high chances of charged off.
  - Notice that with increase in annual income charged off proportion got decreased.

BIVARIATE ANALYSIS



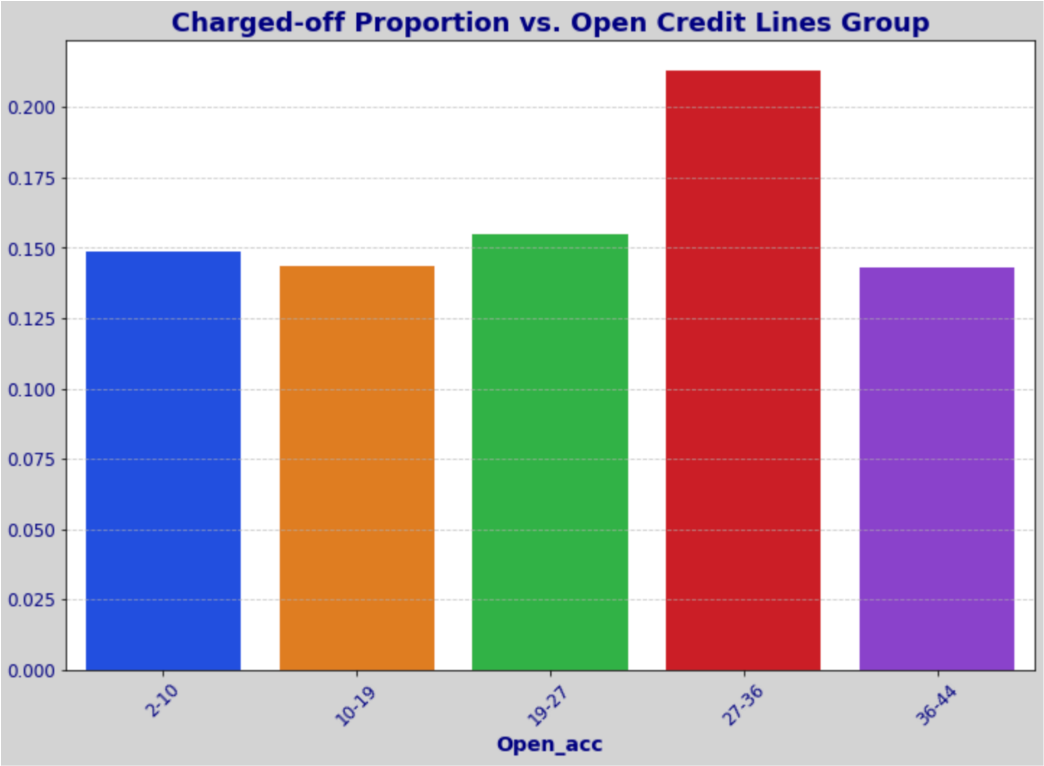
- **Charged-off Proportion vs. Derogatory Public Records**
- **OBSERVATIONS:**
  - For individuals with 0 public records, the proportion of charged-off loans is the lowest.
  - When there is one public record, the proportion of charged-off loans increases to around 22.80%, which is the highest among the given categories.
  - Similarly, for those with two public records, the proportion of charged-off loans is also high, at approximately 21.74%.
  - Interestingly, for individuals with three or four public records, there are no charged-off loans recorded, indicating a possible anomaly or lack of sufficient data in these categories.
  - While the count of charged-off loans was higher when the number of public records was 0 during univariate analysis, further exploration in the bivariate analysis reveals that the proportion of charged-off loans is higher when the number of public records is 1 or 2. This suggests that although the absolute count of charged-off loans may be higher when there are no public records, the likelihood of defaulting on a loan increases with a higher number of public records.

BIVARIATE ANALYSIS



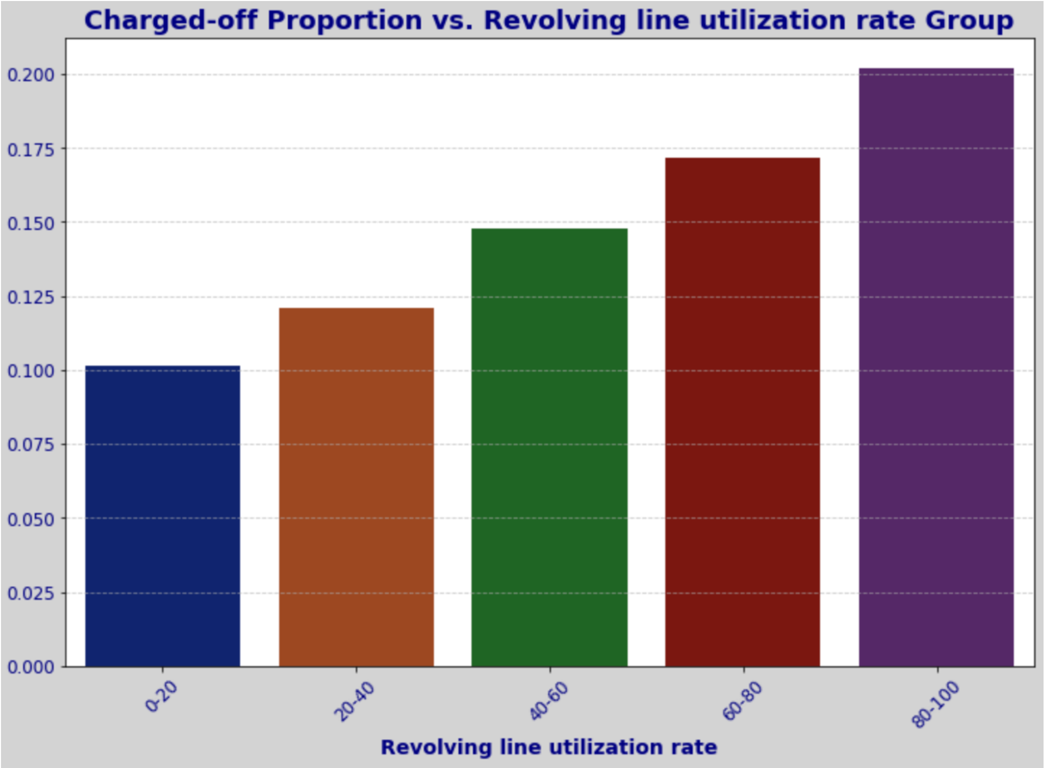
- **Charged-off Proportion vs. Interest Rate Groups**
- **OBSERVATIONS:**
  - The proportion of charged-off loans tends to increase as the interest rate groups rise.
  - For the interest rate group of 21%-24%, the charged-off proportion is the highest
  - As the interest rate groups decrease, the proportion of charged-off loans also decreases.
  - In univariate analysis, a higher count of charged-off loans was observed in the interest rate group of 13%-17%. However, in bivariate analysis, when considering the proportion of charged-off loans relative to the total number of loans in each interest rate group, it was found that the charged-off proportion was highest in the interest rate group of 21%-24%.
  - This discrepancy suggests that while the count of charged-off loans may be higher in a particular interest rate group in univariate analysis, it is essential to consider the proportion relative to the total number of loans to understand the true risk associated with each interest rate group.

BIVARIATE ANALYSIS



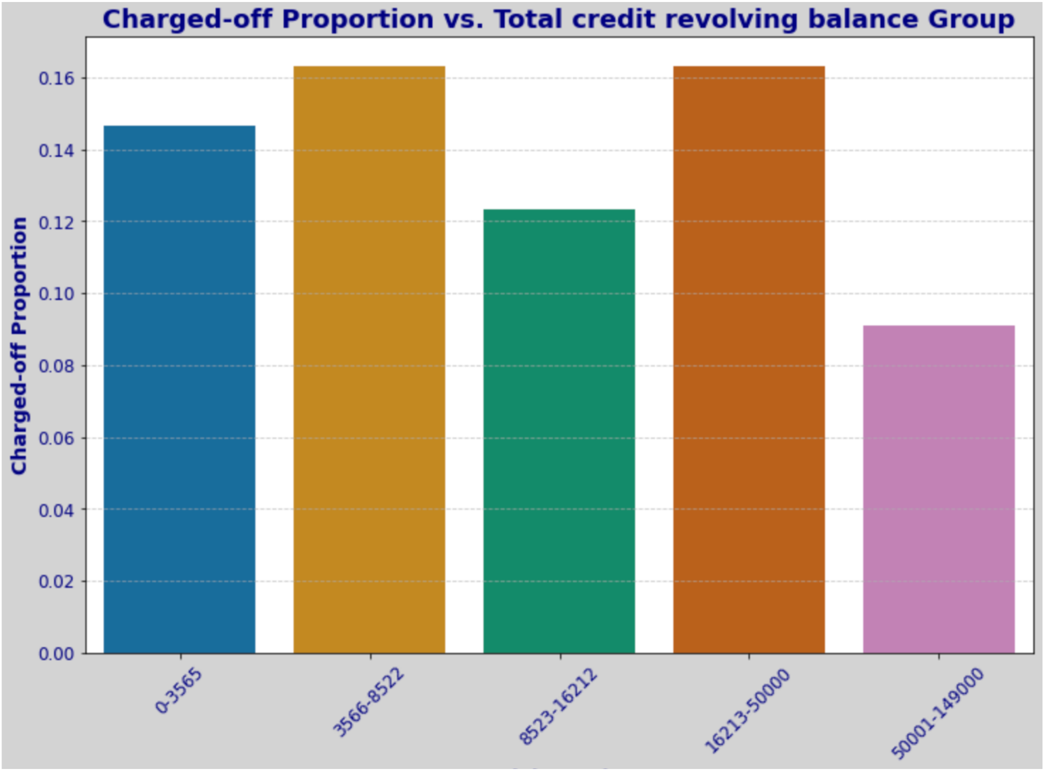
- **Charged-off Proportion vs. Open Credit Lines Groups**
- **OBSERVATIONS:**
  - The highest proportion of charged-off loans is observed in the "27-36" range
  - The next highest proportion of charged-off loans is in the "19-27" range
  - Interestingly, the "36-44" range has the lowest proportion of charged-off loans, with only one instance.
  - In univariate analysis, it was observed that charged-off loans were more likely in the "2-10" range. However, in the bivariate analysis, it's evident that the proportion of charged-off loans is higher in the "27-36" range.
  - This discrepancy could be due to the influence of other factors when considering the number of open credit lines alongside loan status. It's possible that borrowers with a higher number of open credit lines within the "27-36" range may have specific characteristics or financial behaviors that make them more likely to default on their loans, despite having more open credit lines compared to those in the "2-10" range.

BIVARIATE ANALYSIS



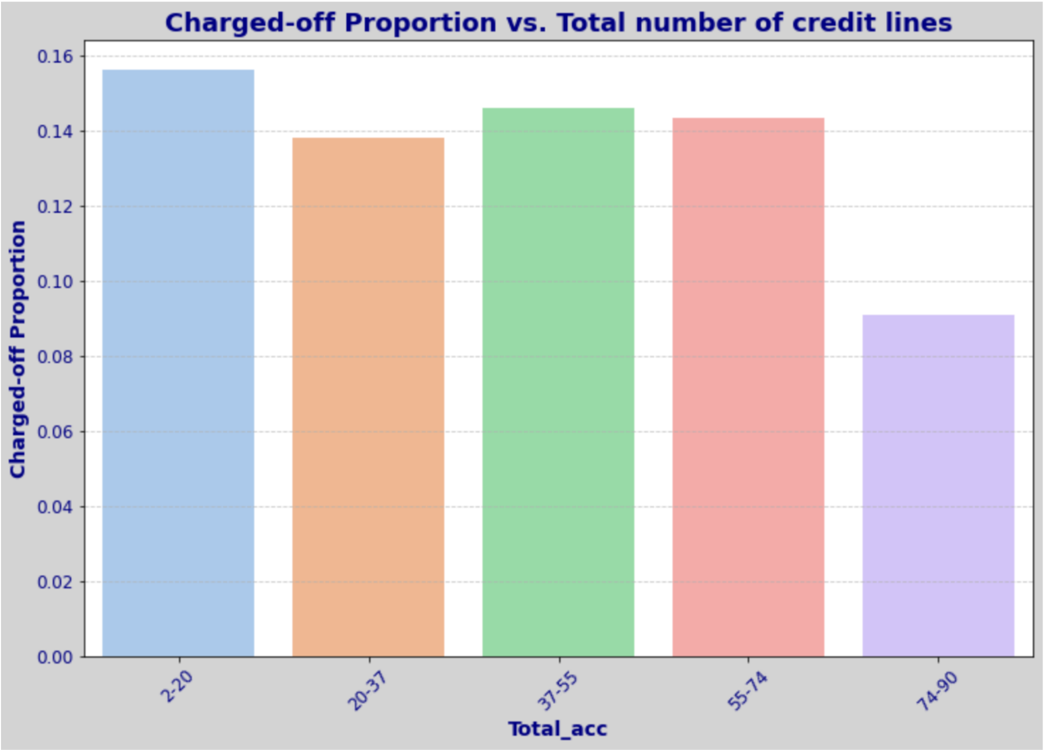
- **Charged-off Proportion vs. Revolving line utilization rate Group**
- **OBSERVATIONS:**
  - The data suggests a trend where borrowers with higher revolving line utilization rates tend to have a higher proportion of charged-off loans
  - Borrowers in the "80-100" range, indicating high utilization rates, have the highest proportion of charged-off loans, followed by those in the "60-80" range
  - Conversely, borrowers in the "0-20" range, indicating low utilization rates, have the lowest proportion of charged-off loans.
  - This observation aligns with the common understanding that higher levels of debt utilization may indicate financial strain, leading to a higher likelihood of loan default.
  - Lenders may consider these insights when assessing the risk associated with borrowers based on their revolving line utilization rates.

BIVARIATE ANALYSIS



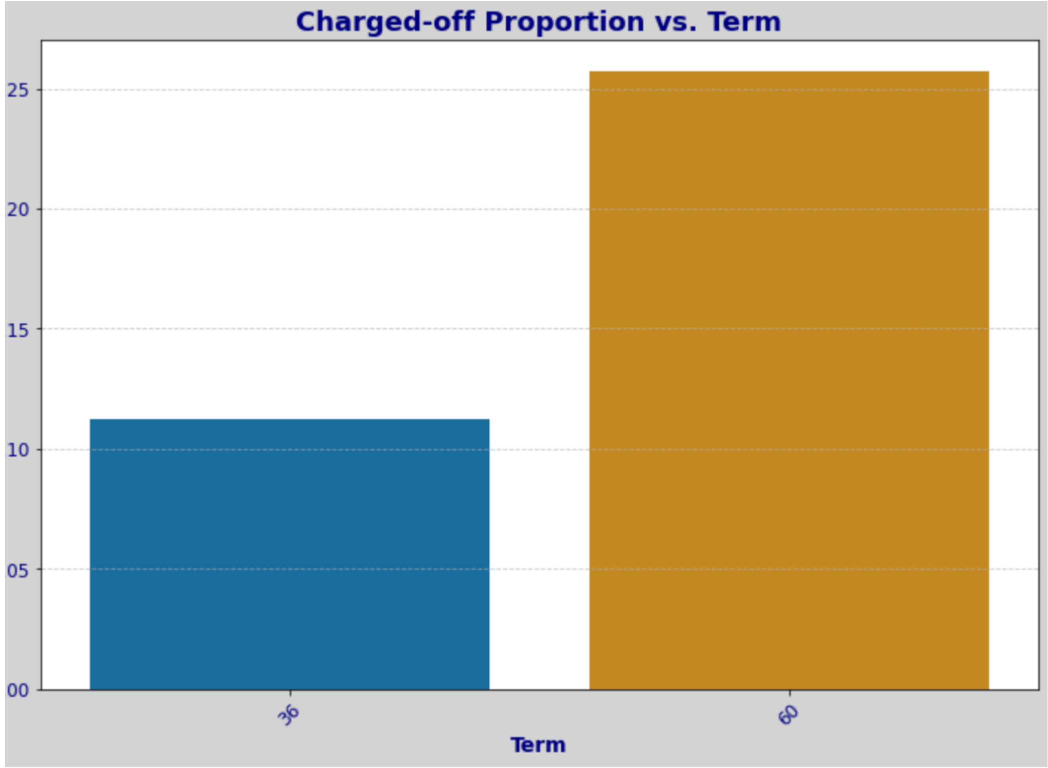
- **Charged-off Proportion vs. Total Credit Revolving Balance Group**
- **OBSERVATIONS:**
  - The highest proportion of charged-off loans is observed in the '3566-8522' and '16213-50000' revol_bal_groups, with approximately 16.3% of loans in each group resulting in charged-off status.
  - The '0-3565' revol_bal_group, despite having the highest count of charged-off loans, exhibits a slightly lower proportion of charged-off loans at approximately 14.7%
  - This suggests that while the '0-3565' revol_bal_group had the highest count of charged-off loans in univariate analysis, the proportion of charged-off loans within this group is not the highest compared to other revol_bal_groups. Other factors such as the overall size of each revol_bal_group and its composition may influence this discrepancy.

BIVARIATE ANALYSIS



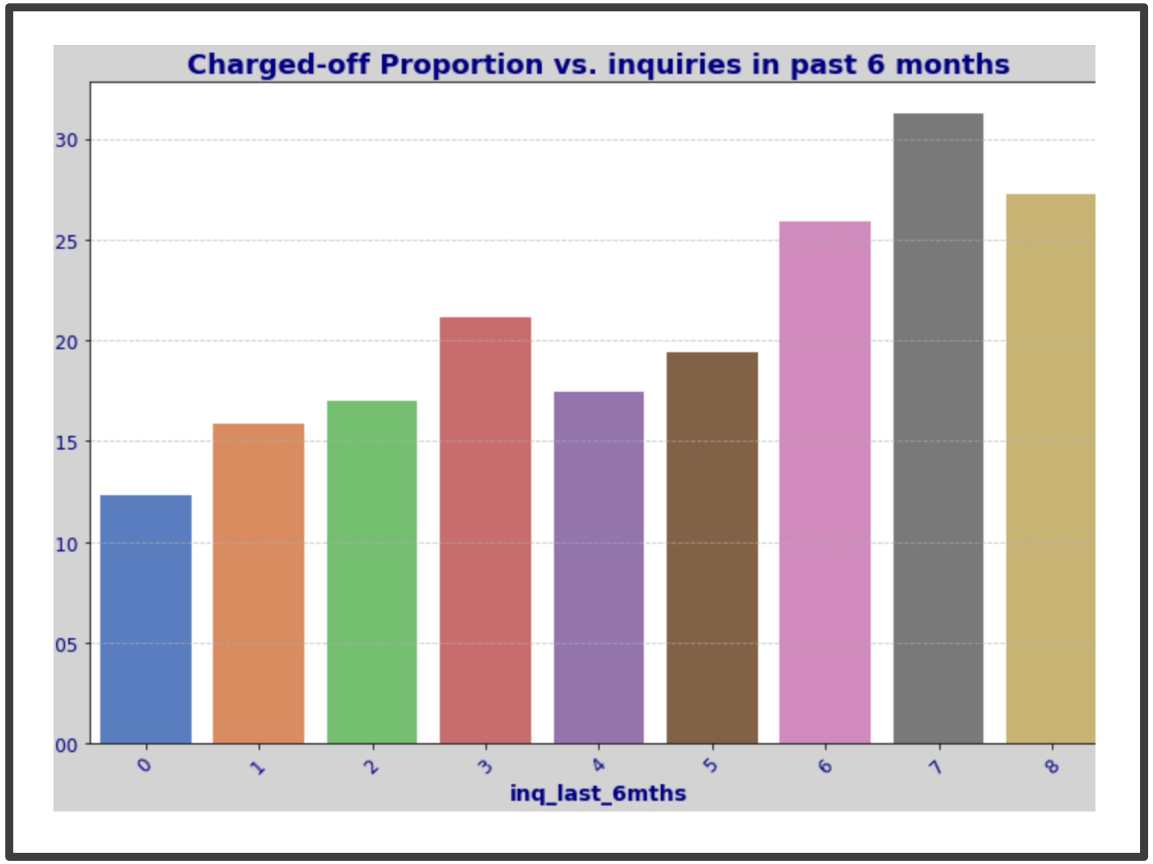
- **Charged-off Proportion vs. Total Number of credit lines**
- **OBSERVATIONS:**
  - The '2-20' total_acc_group has the highest count of charged-off loans, with 2765 loans resulting in charged-off status. However, the proportion of charged-off loans in this group is approximately 15.6%
  - As the total_acc_groups increase, the proportion of charged-off loans tends to decrease, with the '74-90' total_acc_group having the lowest proportion at approximately 9.1%
  - Despite having a lower count of charged-off loans, the '74-90' total_acc_group exhibits the lowest proportion of charged-off loans among all groups, indicating a potential inverse relationship between total_acc_groups and charged-off proportion

BIVARIATE ANALYSIS



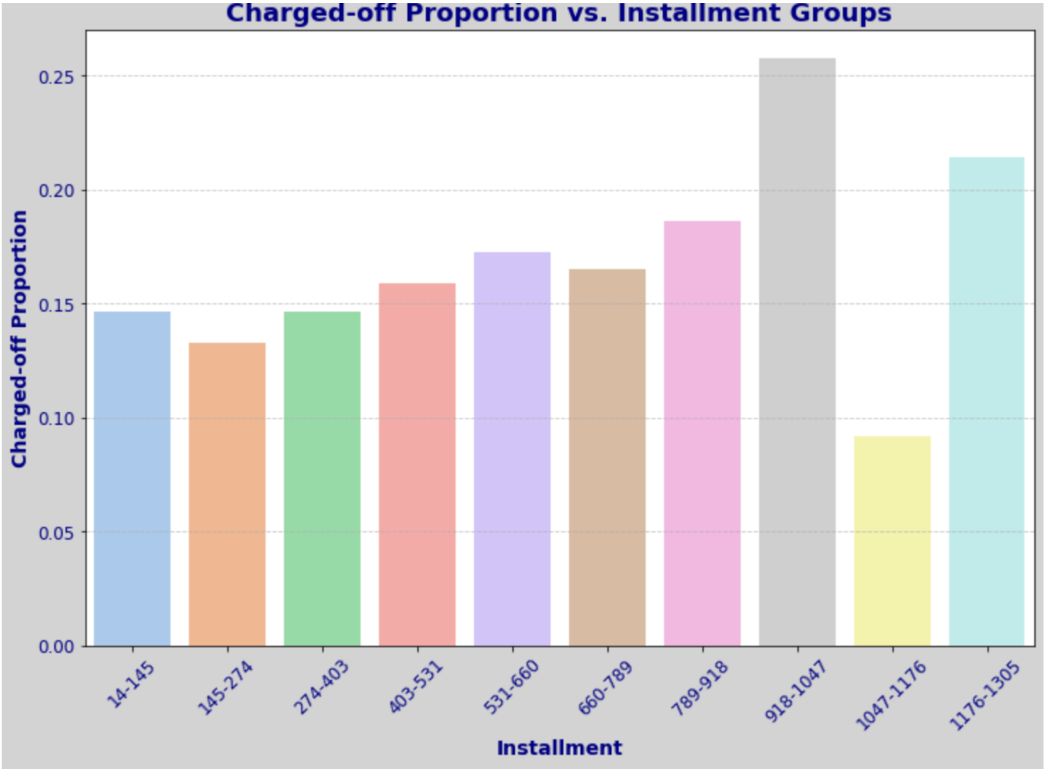
- **Charged-off Proportion vs. Term**
- **OBSERVATIONS:**
  - For the loan term, loans with a term of 60 months (5 years) have a higher proportion of charged-off instances compared to loans with a term of 36 months (3 years). Specifically, the charged-off proportion for loans with a 60-month term is approximately 25.7%, whereas for loans with a 36-month term, it is approximately 11.2%.
  - The univariate analysis indicated that loans with a 36-month term were more likely to be charged off. However, the bivariate analysis reveals that while the count of charged-off loans is higher for the 36-month term, the proportion of charged-off loans is significantly higher for the 60-month term.
  - This suggests that although loans with a 36-month term may have a higher count of charged-off instances, loans with a longer term of 60 months exhibit a higher proportion of charged-off instances relative to the total number of loans in that term category.

BIVARIATE ANALYSIS



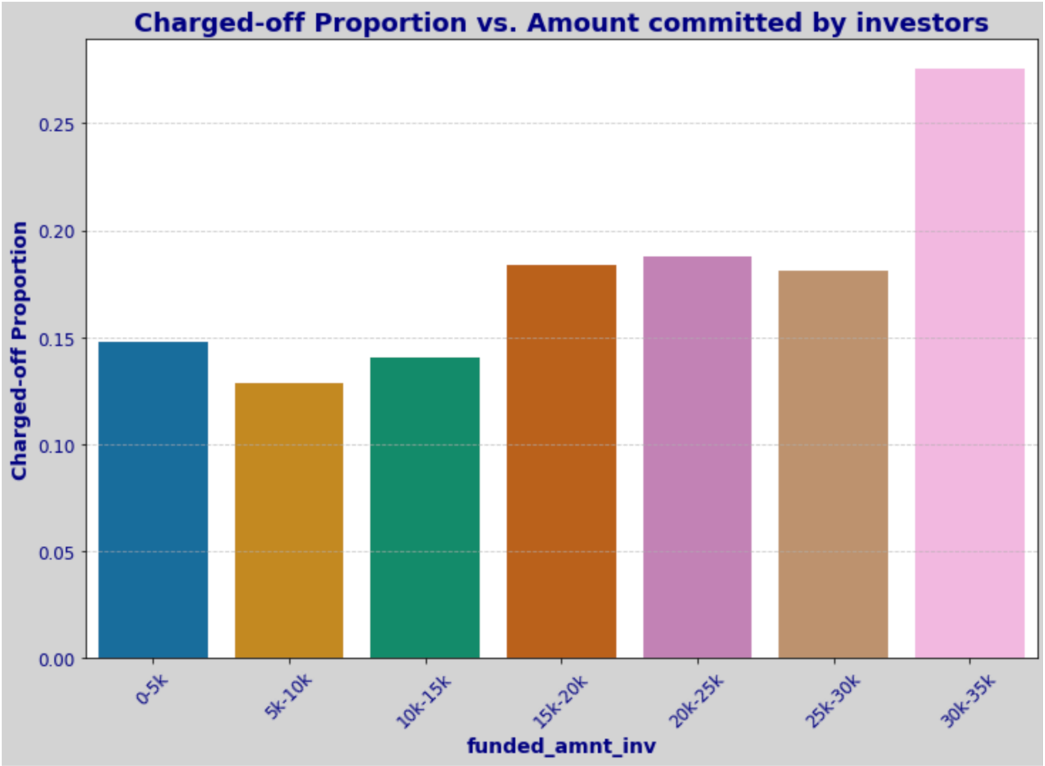
- **Charged-off Proportion vs. Inquiries in last 6 months**
- **OBSERVATIONS:**
  - In the univariate analysis, it was observed that loans with 0 inquiries in the last 6 months had a higher count of charged-off instances compared to loans with higher numbers of inquiries. This indicated that loans with no recent inquiries were more likely to be charged off.
  - However, in the bivariate analysis, the proportion of charged-off instances relative to the total number of loans in each category of inquiries in the last 6 months provides a different perspective. While loans with 0 inquiries still have a relatively high count of charged-off instances, the proportion of charged-off instances to the total number of loans in that category is lower compared to some other categories.

BIVARIATE ANALYSIS



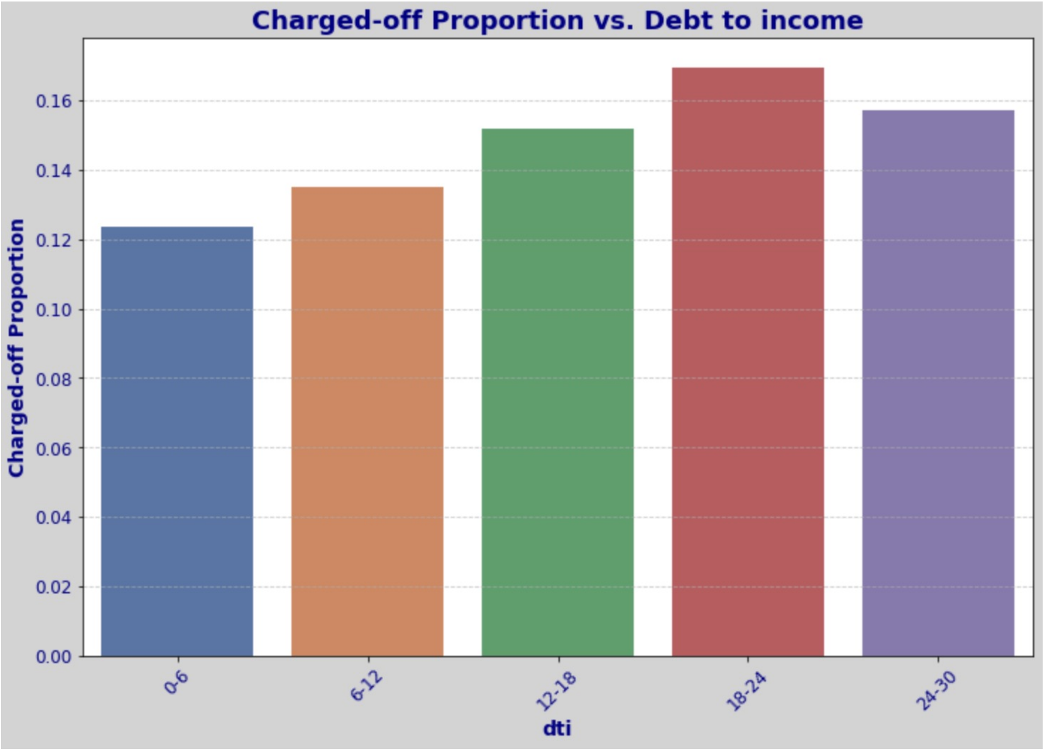
- **Charged-off Proportion vs. Installment Groups**
- **OBSERVATIONS:**
  - In the univariate analysis, it was observed that loans with installment amounts falling within the range of 145-274 had a higher count of charged-off instances compared to other installment amount ranges. This suggests that loans with installment amounts in this range were more likely to be charged off based on count alone.
  - However, when considering the proportion of charged-off instances relative to the total number of loans in each installment amount range, a different picture emerges. While loans with installment amounts in the range of 145-274 still have a relatively high count of charged-off instances, the proportion of charged-off instances to the total number of loans in that category is lower compared to some other ranges.
  - For instance, loans with installment amounts in the range of 918-1047 have the highest proportion of charged-off instances, with approximately 25.75% of loans in that category being charged off. This indicates that while loans with installment amounts in the range of 145-274 may have a higher count of charged-off instances, the proportion of charged-off instances relative to the total number of loans in that category is lower compared to categories with higher installment amounts.

BIVARIATE ANALYSIS



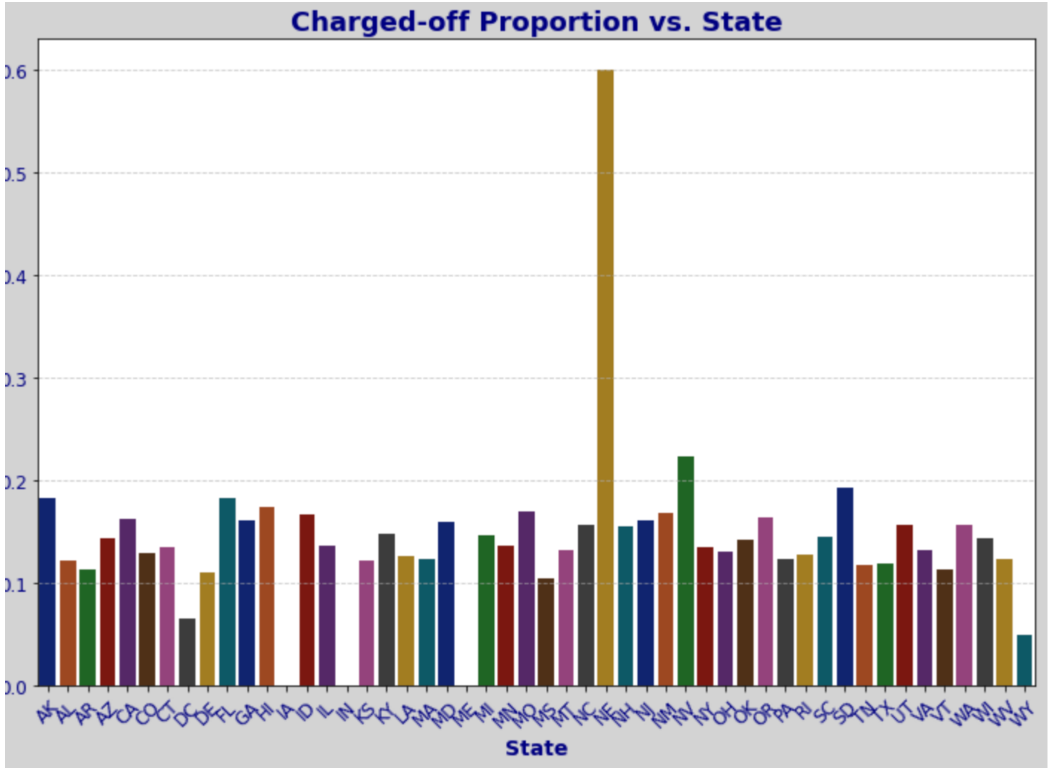
- **Charged-off Proportion vs. Amount committed by investors**
- **OBSERVATIONS:**
  - In the univariate analysis, it was observed that loans with funded amounts falling within the range of 0-5k had a higher count of charged-off instances compared to other funded amount ranges. This suggests that loans with lower funded amounts were more likely to be charged off based on count alone.
  - However, when considering the proportion of charged-off instances relative to the total number of loans in each funded amount range, a different picture emerges. While loans with funded amounts in the range of 0-5k still have a relatively high count of charged-off instances, the proportion of charged-off instances to the total number of loans in that category is lower compared to some other ranges.
  - For instance, loans with funded amounts in the range of 30k-35k have the highest proportion of charged-off instances, with approximately 27.55% of loans in that category being charged off. This indicates that while loans with funded amounts in the range of 0-5k may have a higher count of charged-off instances, the proportion of charged-off instances relative to the total number of loans in that category is lower compared to categories with higher funded amounts.

BIVARIATE ANALYSIS



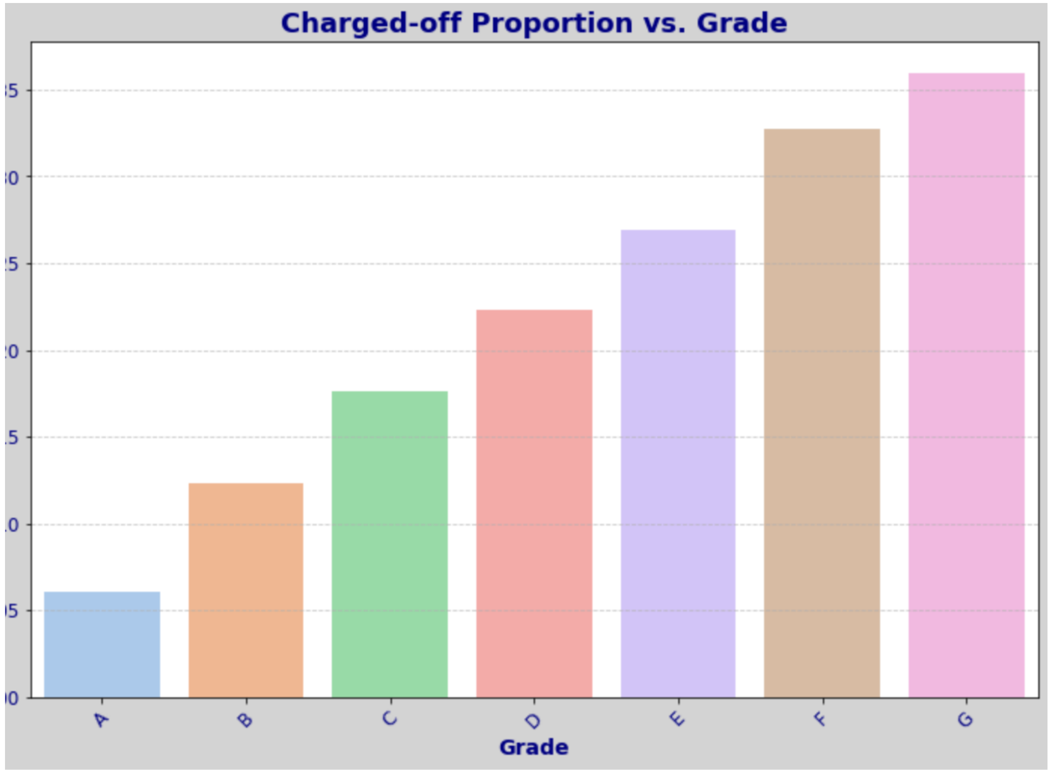
- **Charged-off Proportion vs. Debt to income**
- **OBSERVATIONS:**
  - Higher DTI Ratios Associated with Higher Charged-off Proportions: Loans with higher DTI ratios tend to have higher proportions of charged-off instances. For instance, loans falling within the DTI range of 18-24 exhibit the highest proportion of charged-off instances, with approximately 16.96% of loans in that category being charged off. This suggests that borrowers with higher DTI ratios may face increased risk of defaulting on their loans.
  - Lower DTI Ratios Still Exhibit Charged-off Instances: While loans with lower DTI ratios generally have lower proportions of charged-off instances compared to those with higher DTI ratios, they are not immune to defaults. Even within the DTI range of 0-6, which typically signifies lower debt burdens relative to income, there are still charged-off instances, albeit at a lower proportion compared to higher DTI ranges.
  - Overall, the data indicates a correlation between DTI ratios and loan default rates, with higher DTI ratios generally associated with higher proportions of charged-off instances.

BIVARIATE ANALYSIS



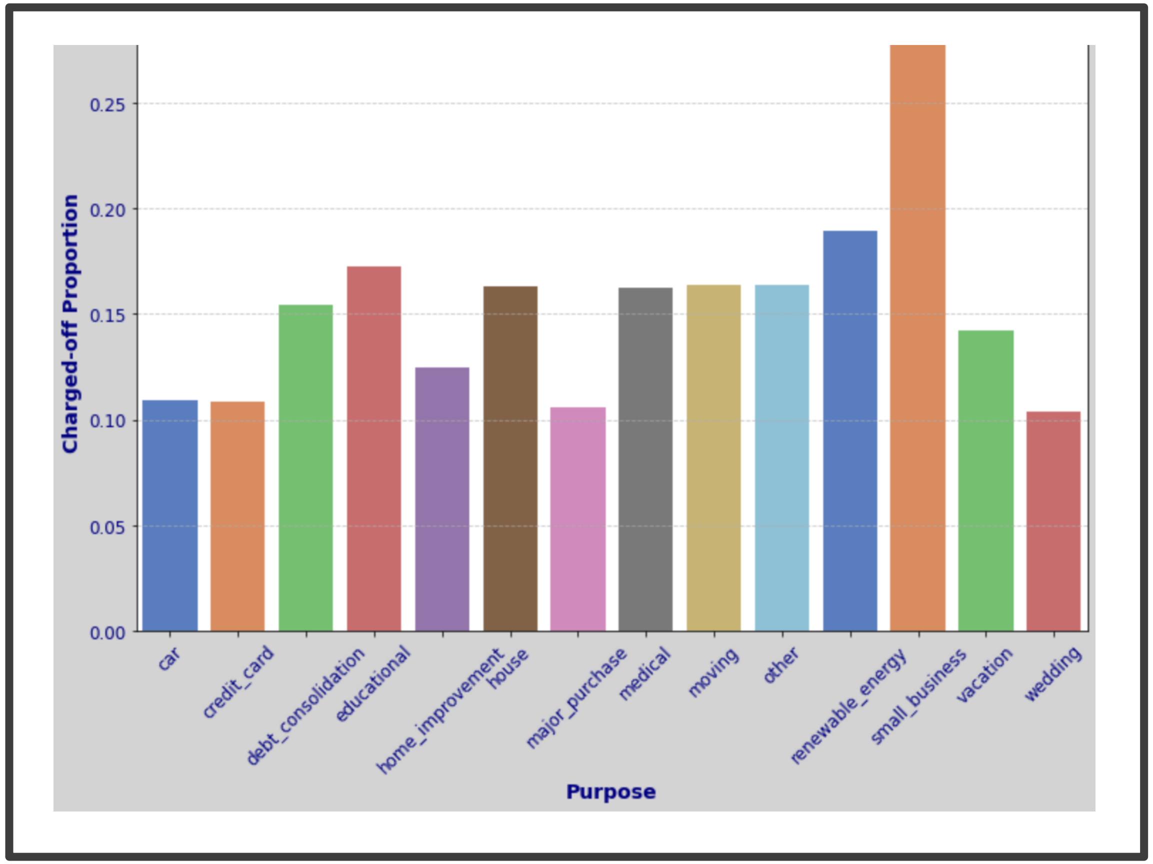
- **Charged-off Proportion vs. State**
- **OBSERVATIONS:**
  - Varying Charged-off Proportions Across States: The proportion of charged-off loans varies significantly across different states. For instance, states like Nebraska (NE), Nevada (NV), and South Dakota (SD) exhibit relatively higher charged-off proportions, with approximately 60%, 22%, and 19.35% of loans in these states being charged off, respectively.
  - High Charged-off Proportions in Certain States: States such as Florida (FL), California (CA), and Georgia (GA) also show relatively high proportions of charged-off loans, with approximately 18.26%, 16.35%, and 16.17% respectively.
  - Regional Variances: These observations suggest that regional economic conditions, borrower demographics, and local lending practices may influence the likelihood of loan default. States with higher charged-off proportions may warrant closer scrutiny in terms of risk assessment and lending practices to mitigate default risks.
  - The univariate analysis, specifically examining loan defaults by state, identified California (CA) as having the highest count of defaulted loans. This finding suggests that, in terms of sheer numbers, California had the most instances of loan defaults compared to other states in the dataset. However, when considering the charged-off proportion (i.e., the proportion of loans charged off relative to the total loans issued) as a measure of default risk, other states may have higher proportions of charged-off loans, indicating a greater risk of default per loan issued.

BIVARIATE ANALYSIS



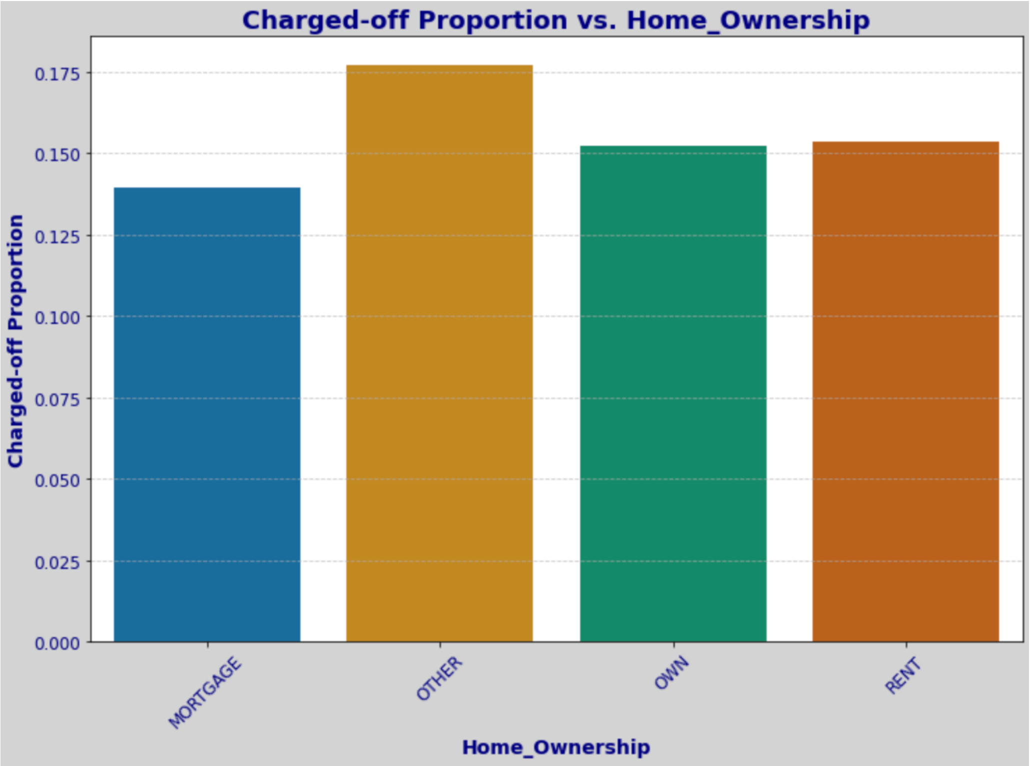
- **Charged-off Proportion vs. Grade**
- **OBSERVATIONS:**
  - In the bivariate analysis of loan defaults by grade, it's evident that the proportion of charged-off loans increases with lower grades. Grade G has the highest proportion of charged-off loans at approximately 35.96%, followed by Grade F with around 32.70%, and Grade E with approximately 26.91%. As the grades improve, the proportion of charged-off loans decreases, with Grade A having the lowest proportion at around 6.12%. This trend suggests that lower-grade loans are associated with a higher risk of default compared to higher-grade loans.
  - The discrepancy between the univariate and bivariate analyses regarding the grade with the highest proportion of charged-off loans. While the univariate analysis pointed towards Grade B as having the highest count of charged-off loans, the bivariate analysis indicates that Grade B actually has a lower proportion of charged-off loans compared to Grades C, D, E, F, and G. This suggests that while Grade B loans may have a higher count of defaults, when considering the proportion relative to the total number of loans in each grade, the risk of default is lower compared to lower-grade loans

BIVARIATE ANALYSIS



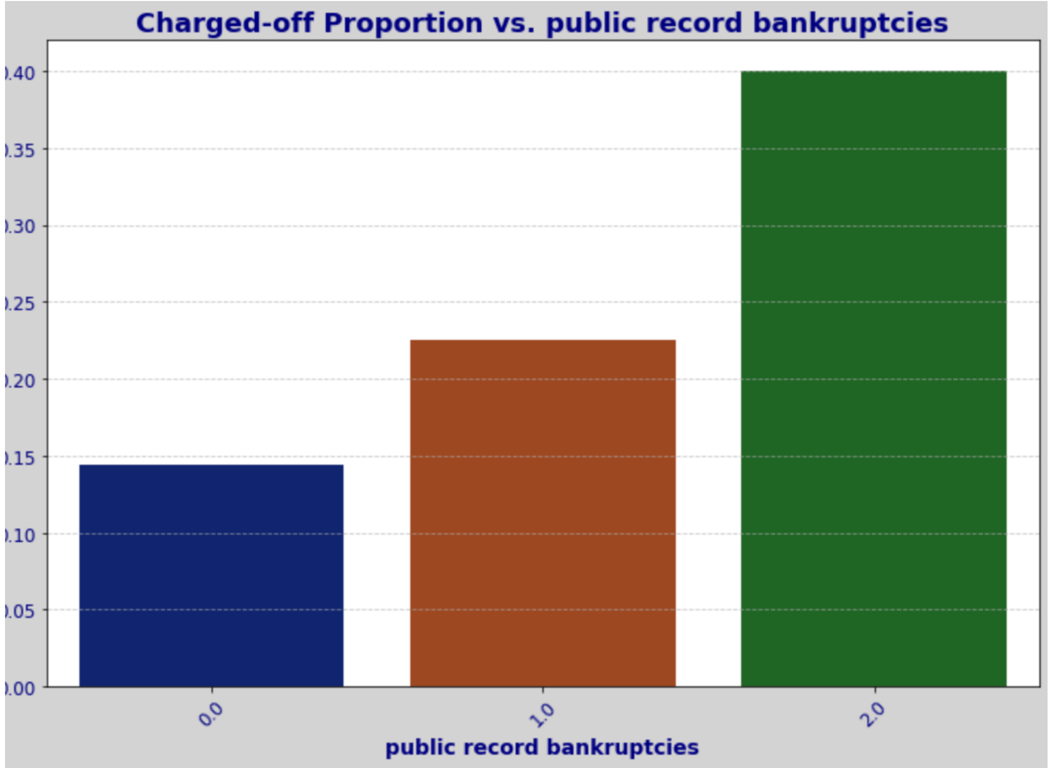
- **Charged-off Proportion vs. Purpose**
- **OBSERVATIONS:**
  - Small business loans have the highest charged-off proportion at around 27.87%, indicating higher risk.
  - Renewable energy loans follow, with a charged-off proportion of about 18.95%.
  - The univariate analysis indicated that debt consolidation loans had the highest count of charged-off instances. However, when considering the charged-off proportion, which reflects the proportion of charged-off loans relative to the total loans for each category, other purposes such as small business, renewable energy, and educational loans exhibit higher risk compared to debt consolidation.

BIVARIATE ANALYSIS



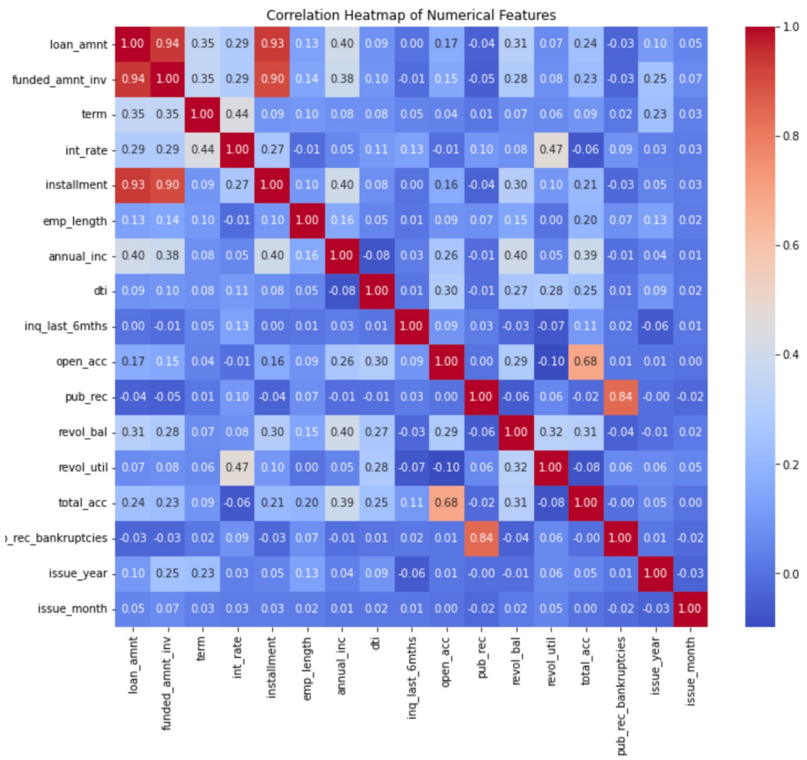
- **Charged-off Proportion vs. Home_Ownership**
- **OBSERVATIONS:**
  - The analysis on home ownership status and loan status indicates that while renters have the highest count of charged-off loans, when considering the proportion of charged-off loans relative to the total loans in each category, 'Other' home ownership status exhibits the highest proportion of charged-off loans. This suggests that although renters have the highest count of charged-off loans, they do not have the highest proportion of charged-off loans when compared to other home ownership categories.

BIVARIATE ANALYSIS



- **Charged-off Proportion vs. Public record bankruptcies**
- **OBSERVATIONS:**
  - The analysis on public record bankruptcies suggests that borrowers with two bankruptcies have the highest proportion of charged-off loans, followed by borrowers with one bankruptcy. Borrowers with no bankruptcies have the lowest proportion of charged-off loans. This indicates a correlation between the number of public record bankruptcies and the likelihood of loan default.

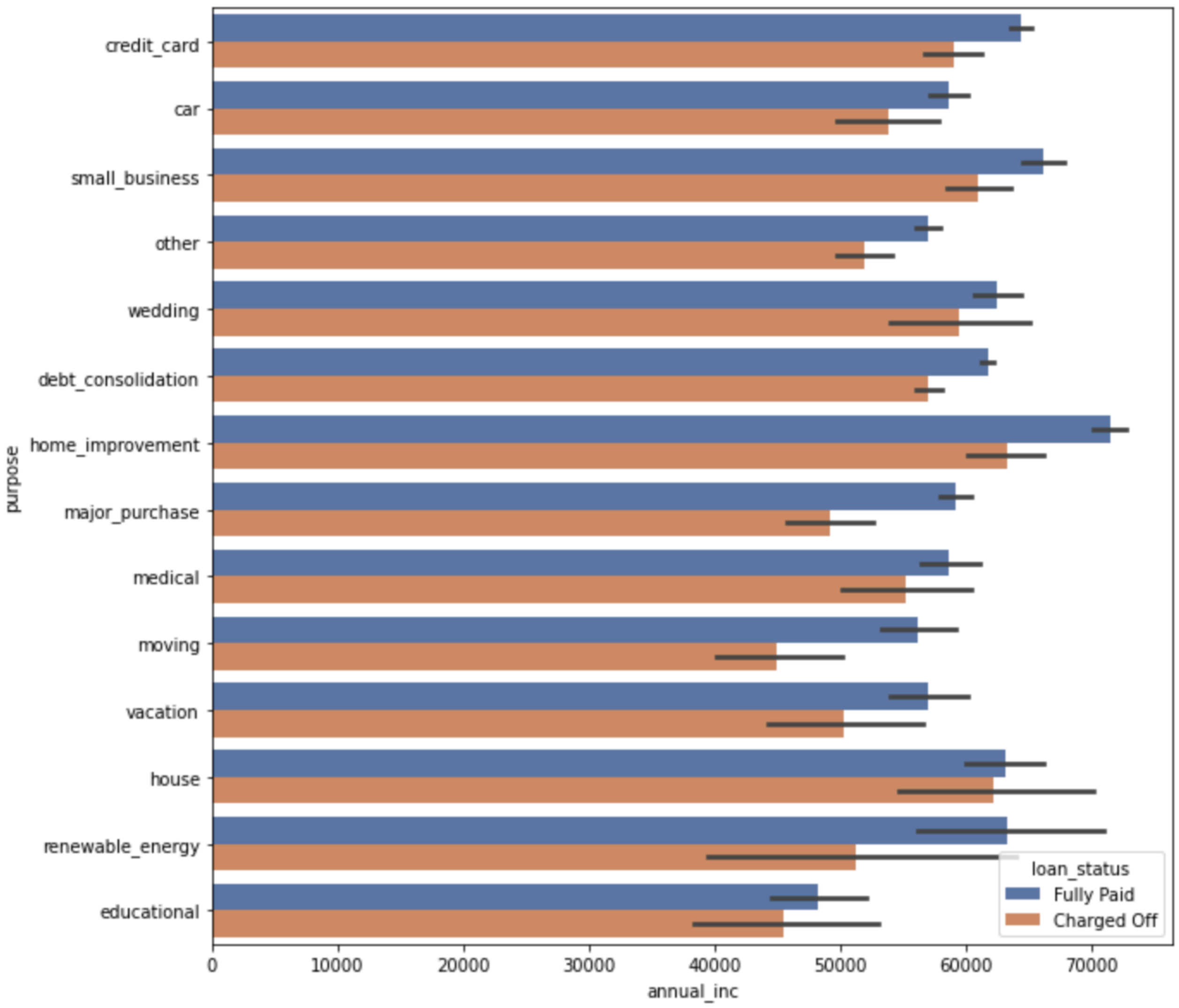
CORRELATION



- **OBSERVATIONS:**
- Negative Correlation:
  - loan_amnt has negative correlation with pub_rec_bankruptcies
  - annual income has a negative correlation with dti
- Strong Correlation:
  - term has a strong correlation with loan amount
  - term has a strong correlation with interest rate
  - annual income has a strong correlation with loan_amount

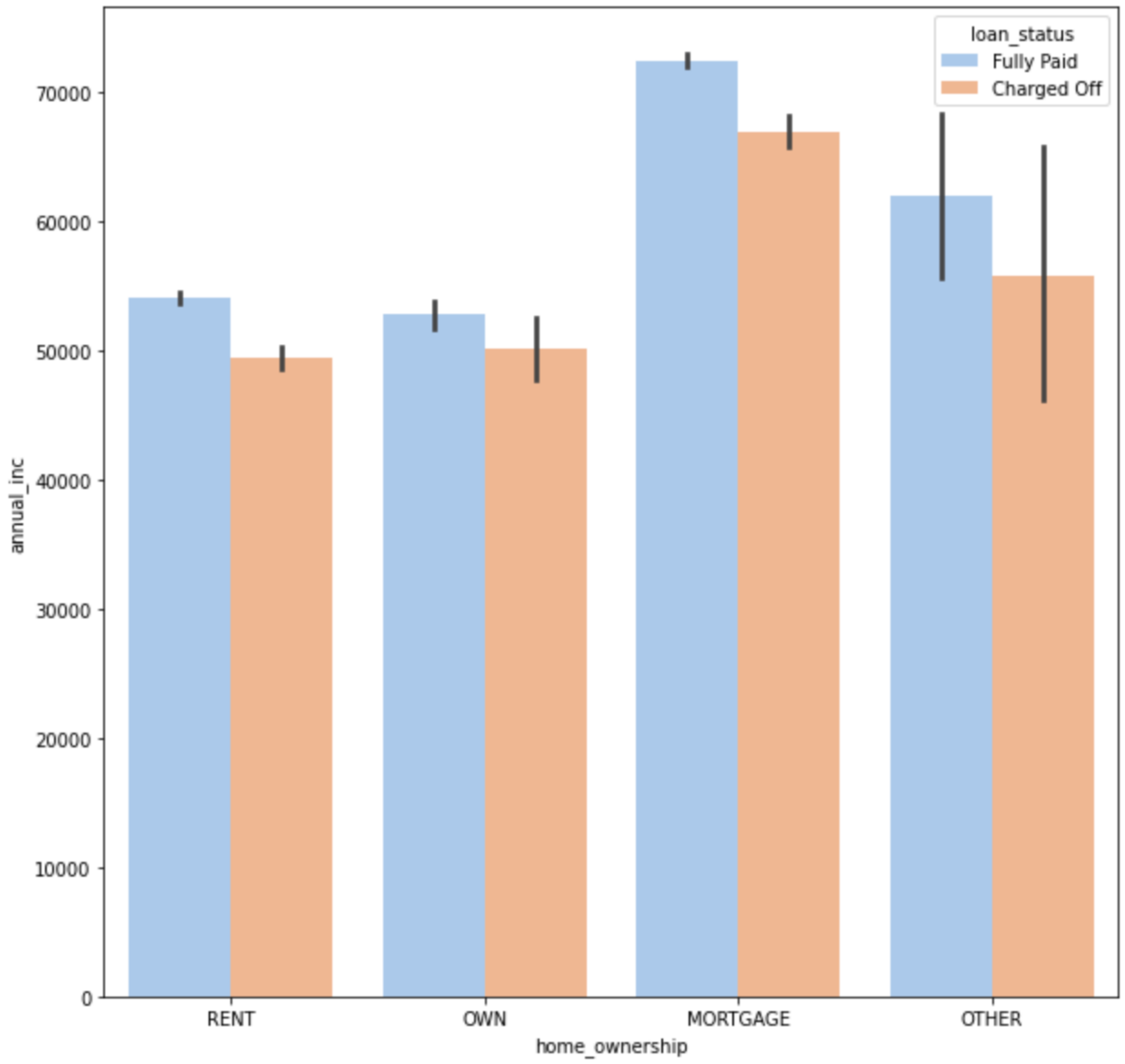
ANNUAL INCOME VS. LOAN PURPOSE

- **OBSERVATIONS:**
  - Though the number of loans applied and defaulted are the highest in number for "debt_consolation", the annual income of those who applied isn't the highest. Applicants with higher salary mostly applied loans for "home_improvment", "house", "renewable_energy", "credit card" and "small_businesses".
  - More likely to Default-
  - Applicants taking loan for 'home improvement' and have income of 60k -70k*



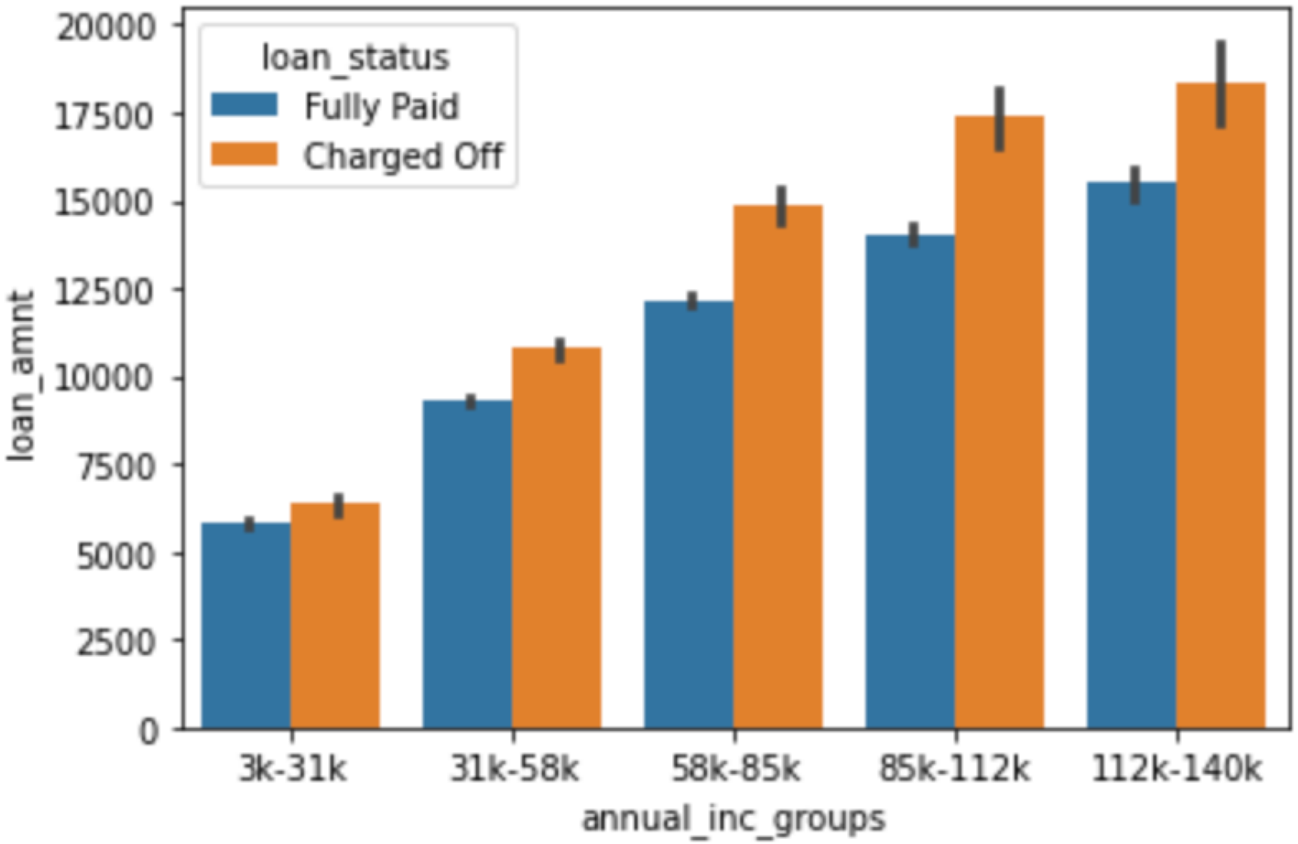
ANNUAL INCOME VS. HOME OWNERSHIP

- **OBSERVATIONS:**
  - More likely to Default - Applicants whose home ownership is 'MORTGAGE and have income of 60-70k



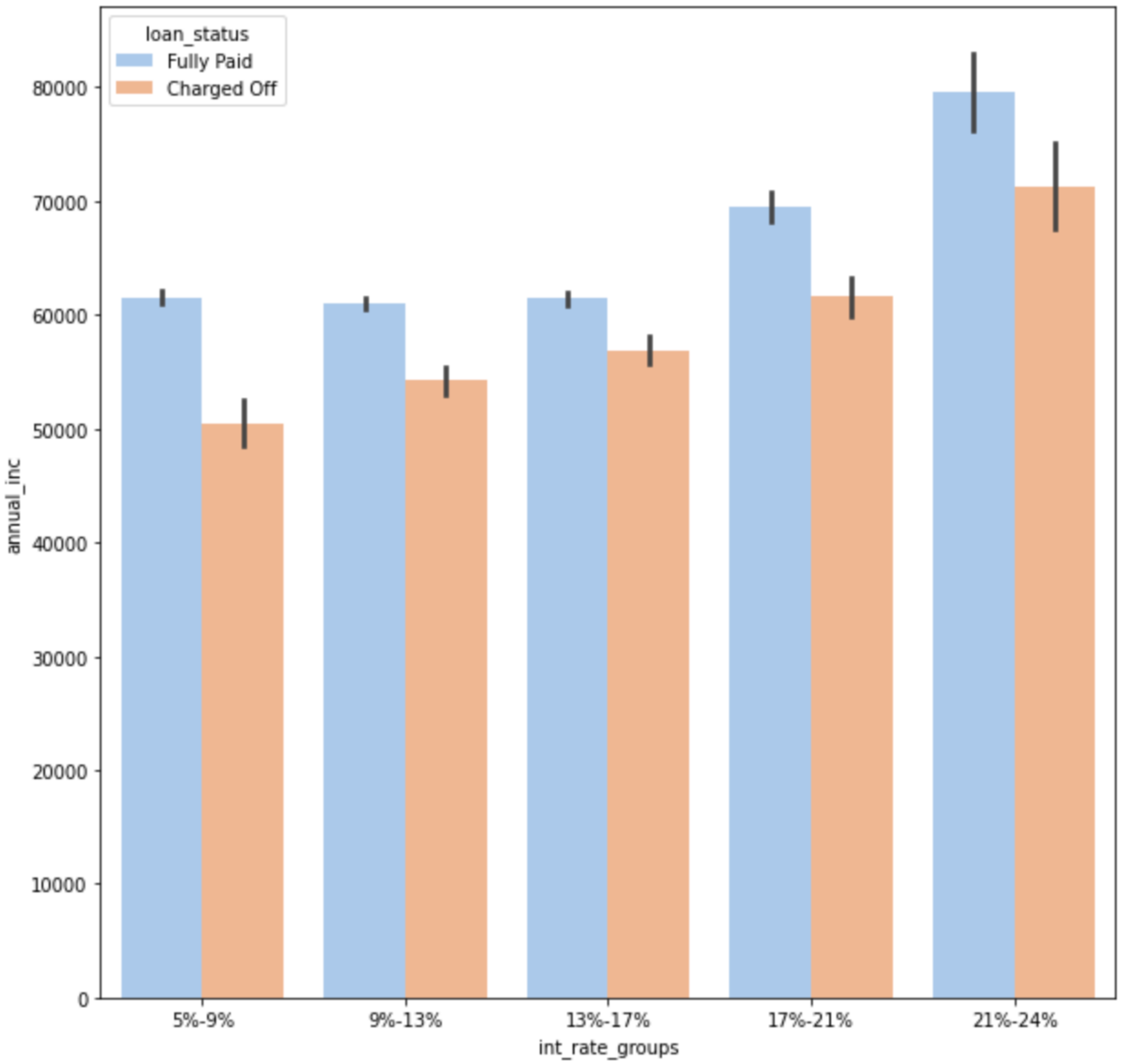
ANNUAL INCOME VS. LOAN AMOUNT

- **OBSERVATIONS:**
  - Across all the income groups, Higher the loan amount higher the Default cases



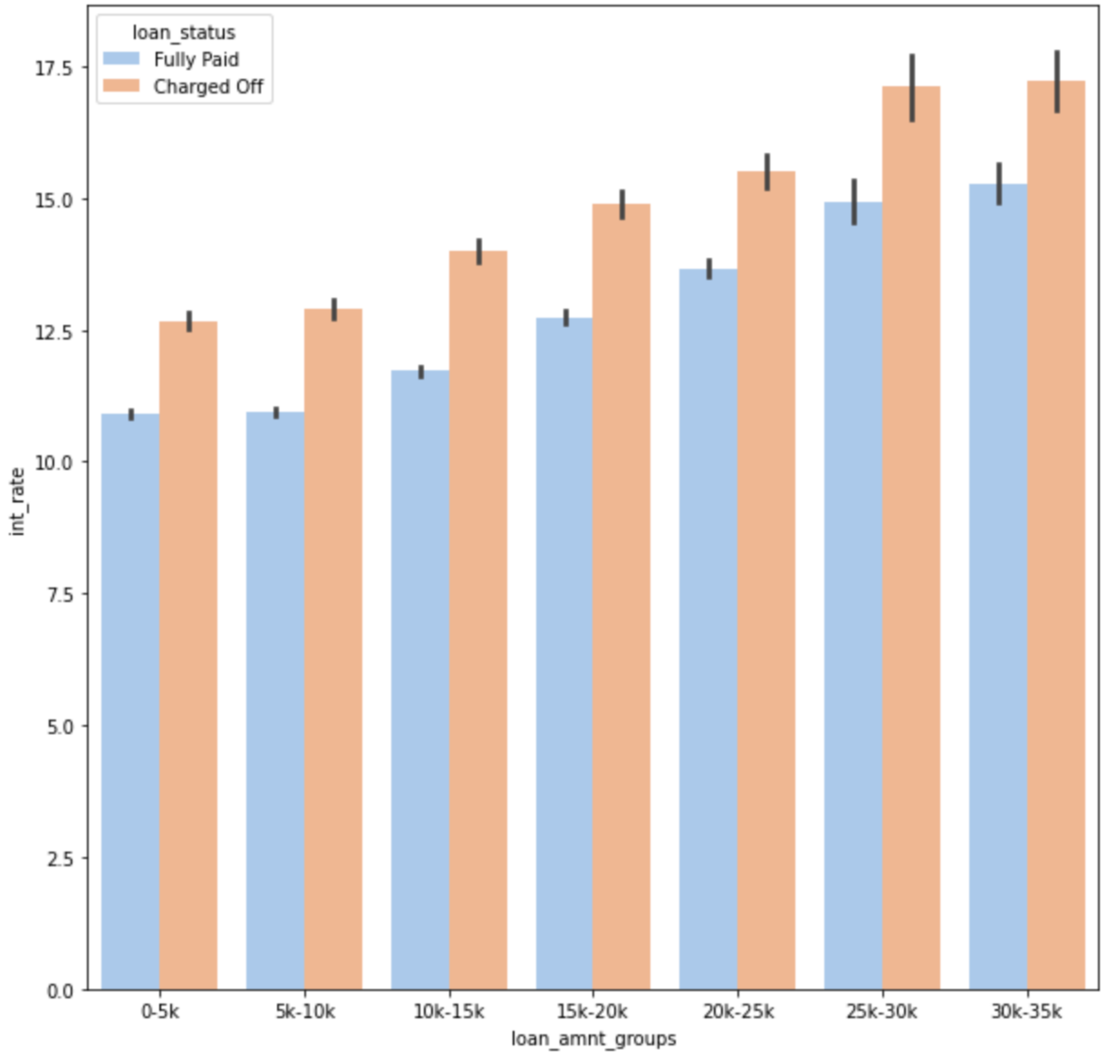
ANNUAL INCOME VS. INT_RATE

- **OBSERVATIONS:**
  - More likely to Default - Applicants who receive interest at the rate of 21-24% and have an income of 70k-80k



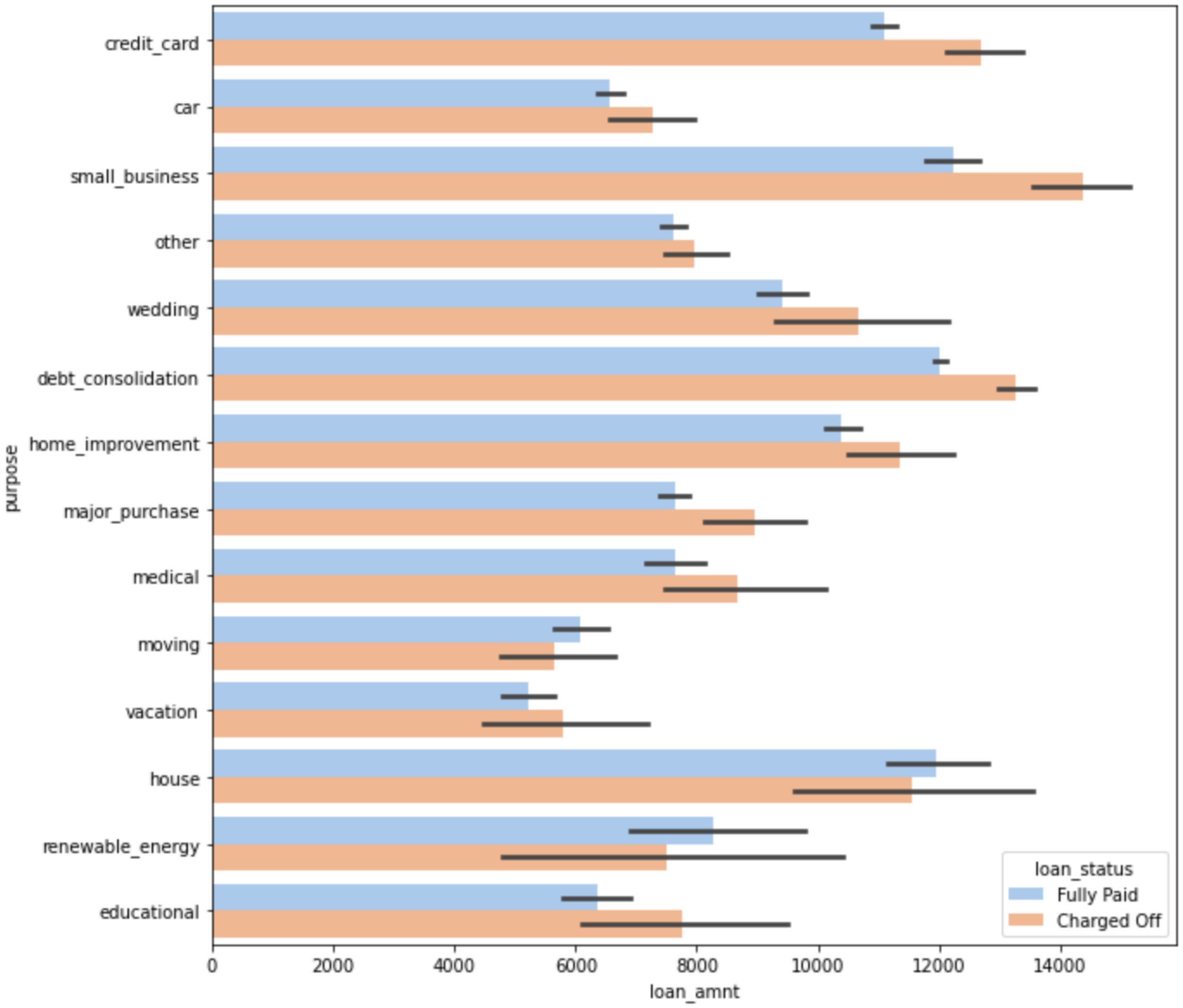
LOAN AMOUNT VS. INT_RATE

- **OBSERVATIONS:**
  - More likely to Default
    - Applicants who have taken a loan in between 25k - 35k and are charged interest rate of 15-17.5 %



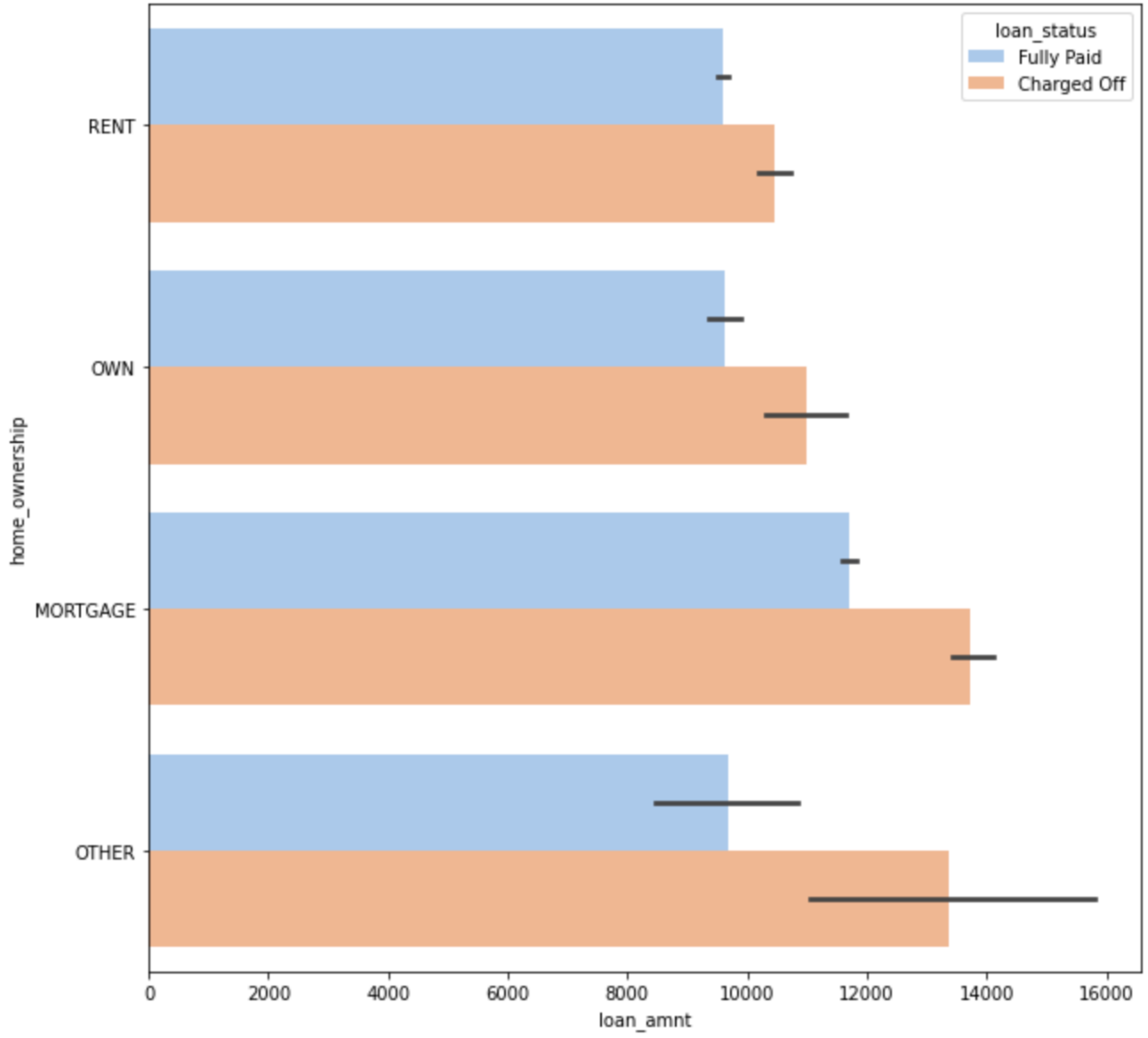
LOAN VS. LOAN PURPOSE

- **OBSERVATIONS:**
  - More likely to Default
    - Applicants who have taken a loan for small business and the loan amount is greater than 14k



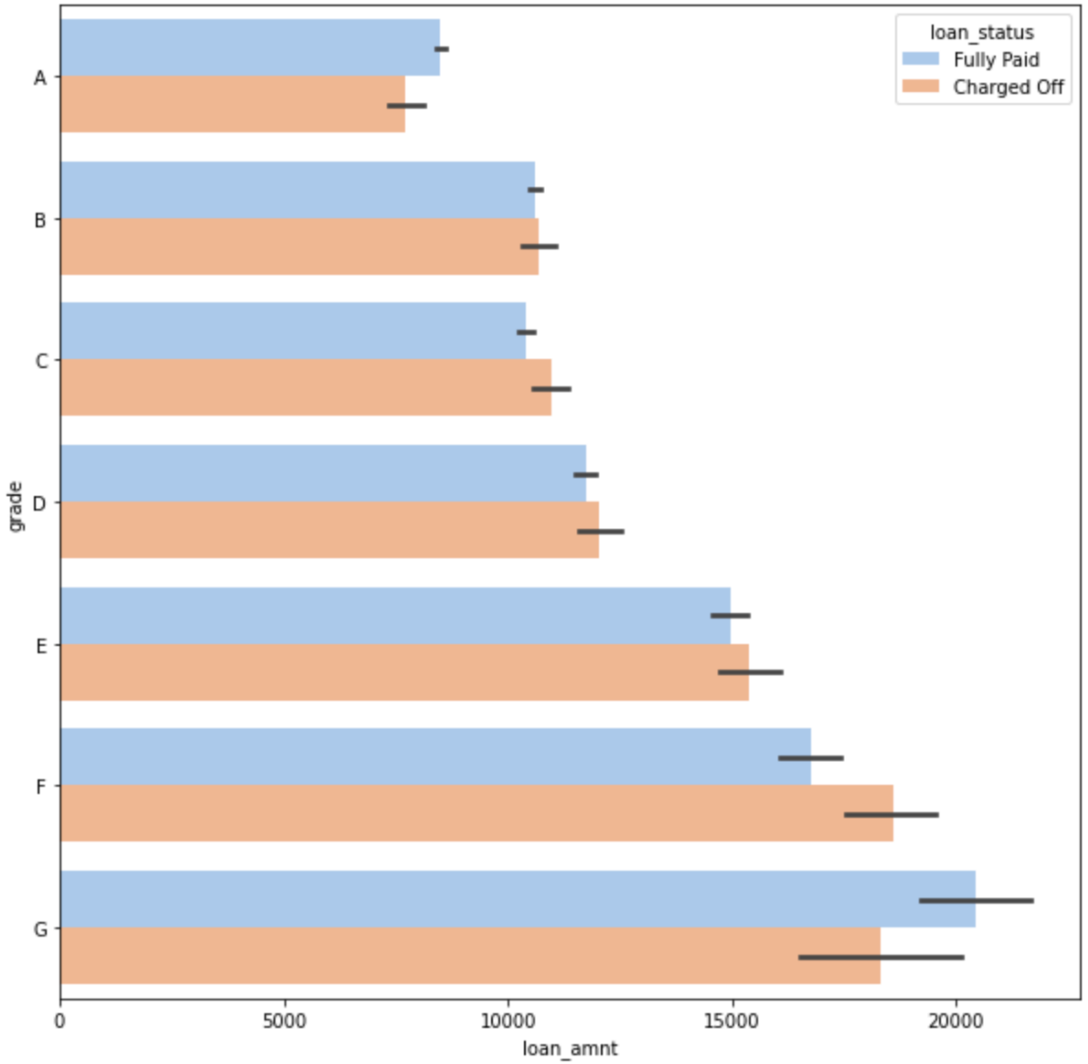
LOAN VS. HOME OWNERSHIP

- **OBSERVATIONS:**
  - More likely to Default
    - Applicants whose home ownership is 'MORTGAGE' and have loan of 14-16k



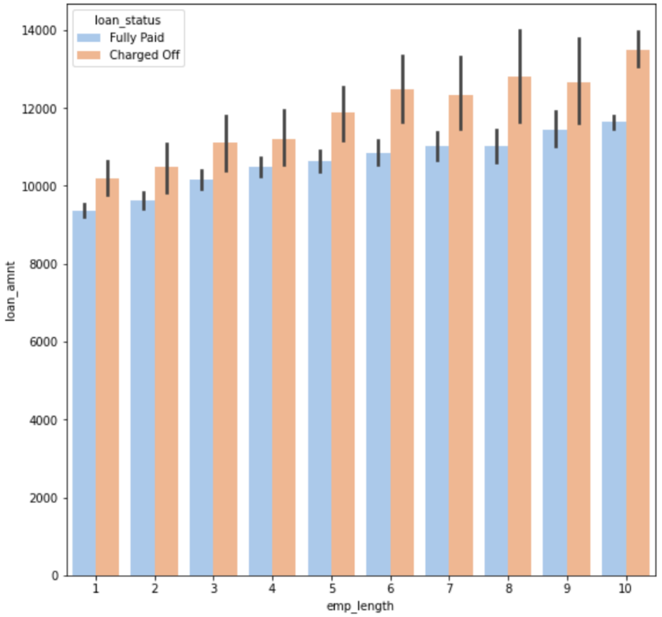
LOAN AMOUNT VS. GRADE

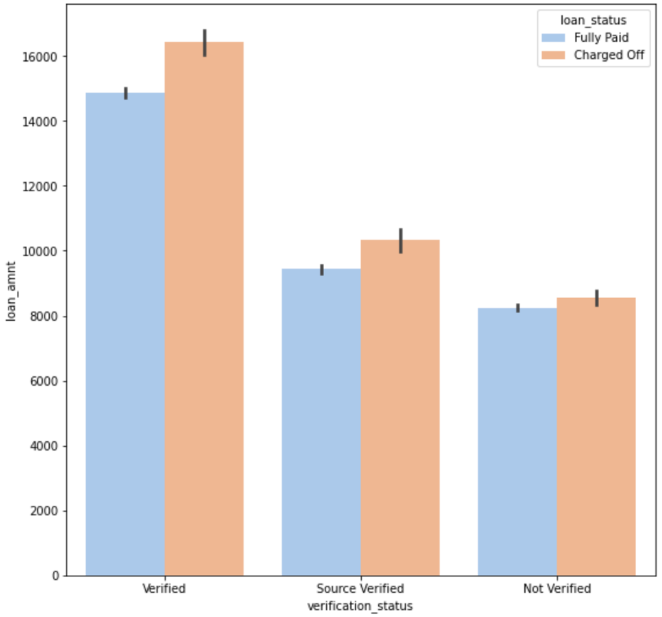
- **OBSERVATIONS:**
  - More likely to Default
    - When grade is F/G and loan amount is between 15k-20k



LOAN AMOUNT VS. EMP_LENGTH & VERIFICATION STATUS

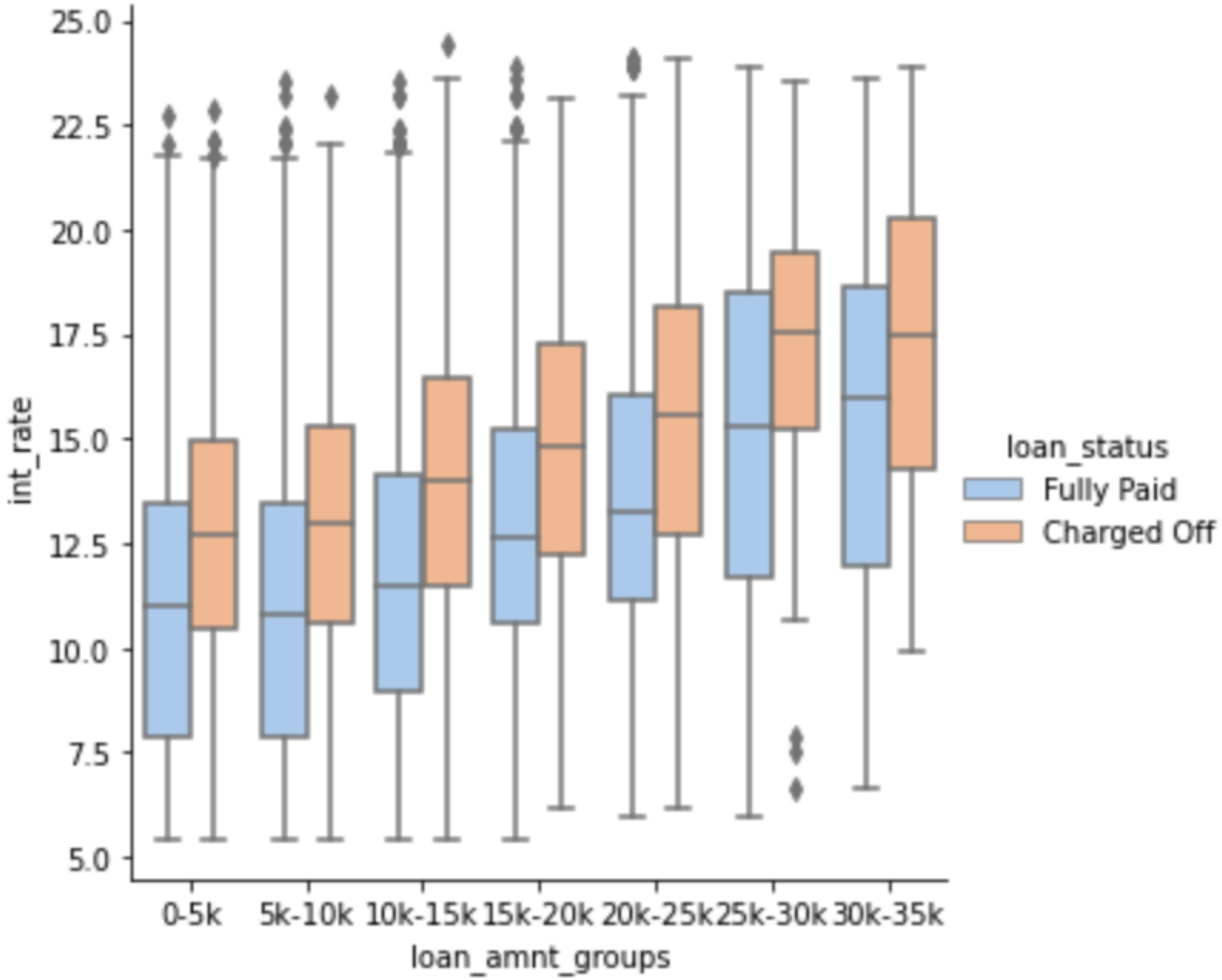
- **OBSERVATIONS:**
  - More likely to Default
    - When employment length is 10yrs and loan amount is 12k-14k
    - When the loan is verified and loan amount is above 16k.
    - Looking at the verification status data, verified loan applications tend to have higher loan amount. Which might indicate that the firms should strictly verify the loans with higher values.





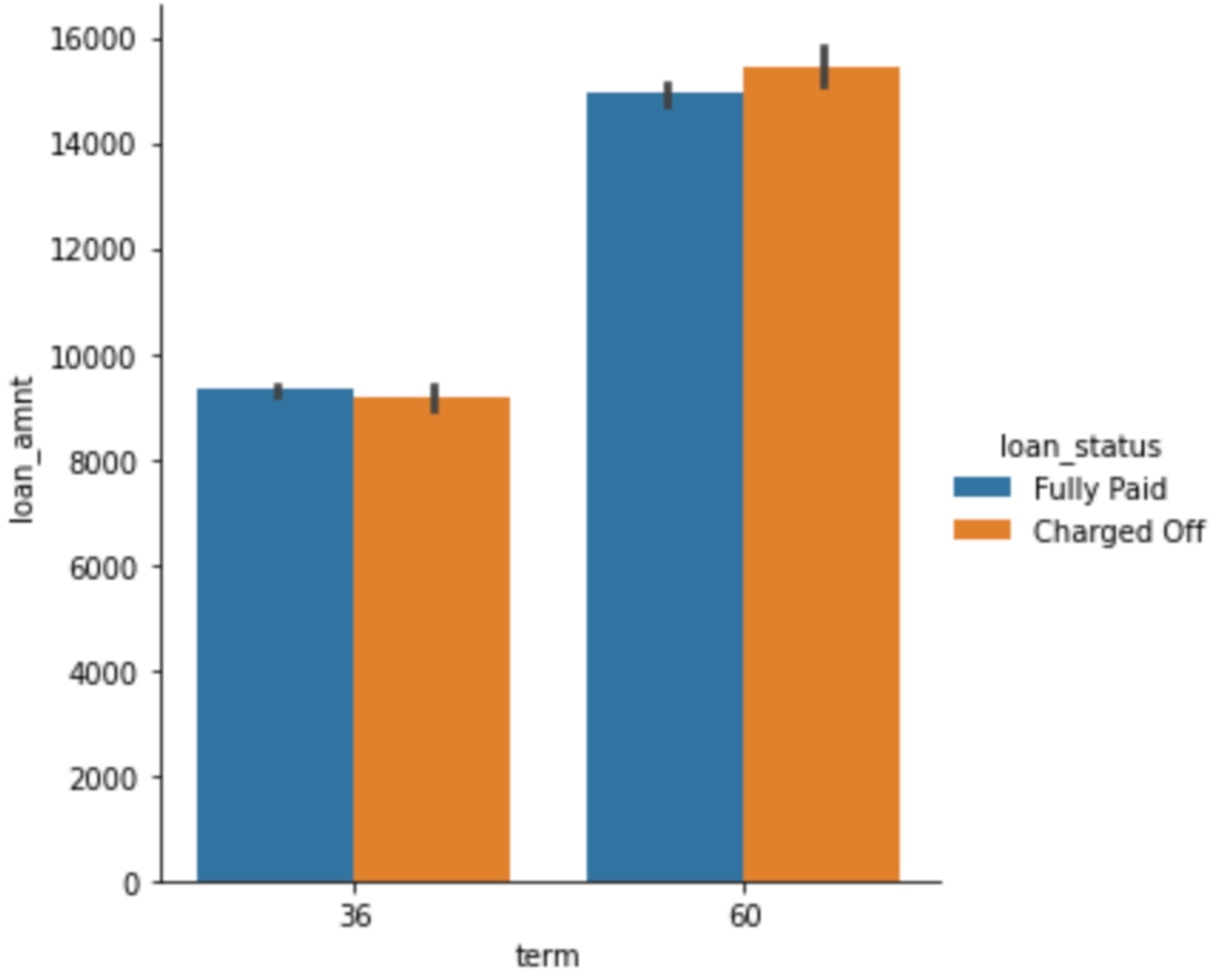
LOAN AMOUNT GROUPS VS. INTEREST RATE

- **OBSERVATIONS:**
  - The interest rate for charged off loans is pretty high than that of fully paid loans in all the loan_amount groups.
    - This can be a pretty strong driving factor for loan defaulting.



LOAN TERM VS. LOAN AMOUNT WITH LOAN STATUS

- **OBSERVATIONS:**
  - Applicants who Fully Paid and defaulted have no significant difference in loan_amounts.
    - Also applicants applying for long term has applied for more loan.



RECOMMENDATIONS

- By integrating the insights into their risk assessment processes, lenders can make more informed decisions, mitigate default risks, and optimize their loan portfolios for better performance and profitability.
- Find insights from next slide.

RECOMMENDATIONS

- **Interest Rate and Employment Length**: Lenders should exercise caution when offering loans to applicants with interest rates falling in the range of 13%-17% and an employment length of 10 years. These applicants demonstrate a higher probability of default.
- **Grade and Sub-Grade**: Loans classified under Grade B and Sub-Grade B5 should be scrutinized more closely, as they exhibit a higher likelihood of default compared to other grades and sub-grades.
- **Home Ownership**: Applicants who rent their homes are more likely to default on loans. Lenders should consider additional risk factors when assessing loan applications from renters.
- **Loan Purpose**: Loans intended for debt consolidation pose a higher risk of default. Lenders should evaluate the financial stability and repayment capacity of applicants seeking debt consolidation loans more thoroughly.
- **Geographical Considerations**: Although California has the highest count of defaulted loans, lenders should also pay attention to states with higher proportions of charged-off loans, such as Nebraska, Nevada, and South Dakota. Regional economic conditions and borrower demographics can impact default rates.
- **Revolving Line Utilization Rate and Revolving Balance**: Borrowers with high revolving line utilization rates (60-80%) and significant revolving balances (3566-8522, 16213-50000) are more likely to default. Lenders should assess these factors when evaluating loan applications.

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- **Total Account and Total Credit Lines**: Borrowers with fewer credit lines (2-20) are associated with higher default rates. Lenders should consider the borrower's credit history and credit utilization when assessing risk.
- **Loan Term**: Loans with longer terms (60 months) have a higher proportion of defaults compared to shorter-term loans (36 months). Lenders should evaluate the borrower's ability to repay over the entire loan term.
- **Verification Status and Inquiries**: Loans with "Not Verified" status and fewer inquiries in the past 6 months are associated with higher default rates. Lenders should verify applicant information rigorously and consider recent credit activity.
- **Derogatory Public Records and Installment Amount**: Borrowers with derogatory public records and higher monthly installments (145-274) are more likely to default. Lenders should assess these risk factors when evaluating loan applications.
- **Debt-to-Income (DTI) Ratio and Funded Amount**: Higher DTI ratios (12-18) and funded amounts (5k-10k) are associated with higher default rates. Lenders should consider the borrower's debt burden and loan amount when assessing risk.

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- **Loan Issuance Date**: Loans issued in December and in the year 2011 show higher default rates. Lenders should consider seasonal and temporal factors when evaluating loan performance.
- **Income Range and Purpose**: Applicants with lower income ranges (3k-31k) and small business loans demonstrate higher default rates. Lenders should assess income stability and the viability of business ventures.
- **Negative Correlation**: Negative correlations between loan amount and public record bankruptcies, as well as between annual income and DTI, indicate potential risk factors. Lenders should analyze these correlations to identify potential red flags in loan applications.
- **Strong Correlation**: Strong correlations between loan term and loan amount, as well as between term and interest rate, highlight interdependencies that may impact default rates. Lenders should consider these factors when structuring loan terms and rates.