Lending Club Case Study

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Problem Statement

A consumer finance company which specializes in lending various types of loans to urban customers. When the company receives a loan application, the company must decide for loan approval based on the applicant's profile

Challenges

1) If the Loan applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company.

2) If the Loan applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company.

How consumer attributes and loan attributes influence the tendency of default ?

Expected Outcome

Perform data analysis and share the outcome . The results should help in deciding for a loan approval when the company receives the loan application.

Approach

1) Understanding the Data

- Familiarize with rows & columns
- Fetch Rows & Columns for the given Dataset
- Null Value Analysis
- Column wise null value analysis

2) Dropping off the columns that doesn’t add value to the decision.

3) Univariate Analysis

4) Multivariate Analysis

5) Bivariate analysis

Null value Analysis

- The loan data set consist of 39717 rows and 111 columns.
- 51.33 % of the the entire data set is comprised of Null Values.
- Total Number of columns with Null Values in the dataset is 68.
- Total Number of columns with all Null Values in the dataset is 54.
- Dropping the columns with all Null values in the dataset , i.e dropping all 54 columns .
- These 54 columns doesn’t contribute for the solution for the problem statement.
- Hence dropping out doesn’t impact the decision.

Univariate Analysis

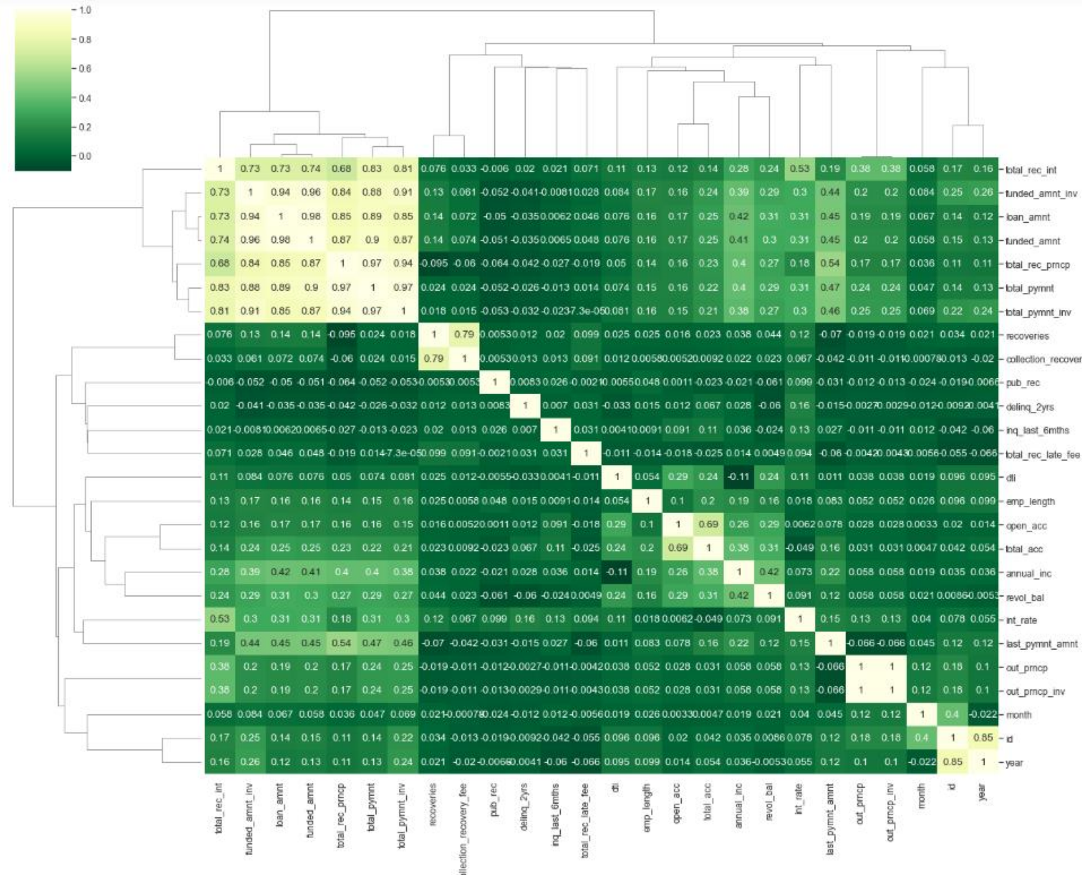
Based on univariate analysis, the outliers of 0.95 quantile are removed from Annual income.

Loan amount is provided based on annual income.

Since outlier values will not contribute much for decision making.

Hence they are removed

Multi Variate Analysis



1) dti (Debt income ratio) is negatively correlated with annual income (-0.11)

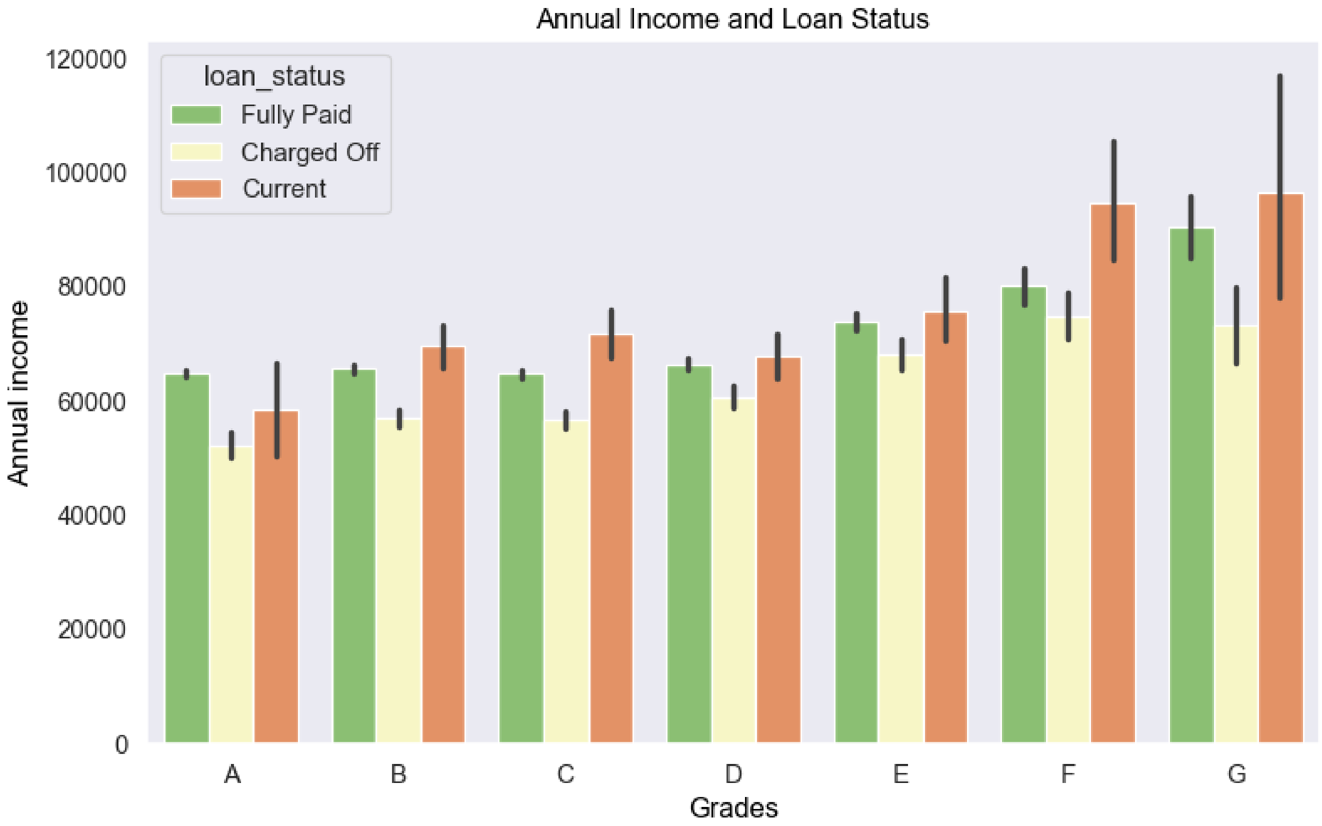
2) Annual income and employment years are positively correlated (0.16)

3) Recoveries to collection recovery fees are strongly correlated.

4) A person with increase in Annual income pays the loan properly

5) Loan amount, investor amount, funding amount are strongly correlated

Analyzing loan status with Annual income across Grades



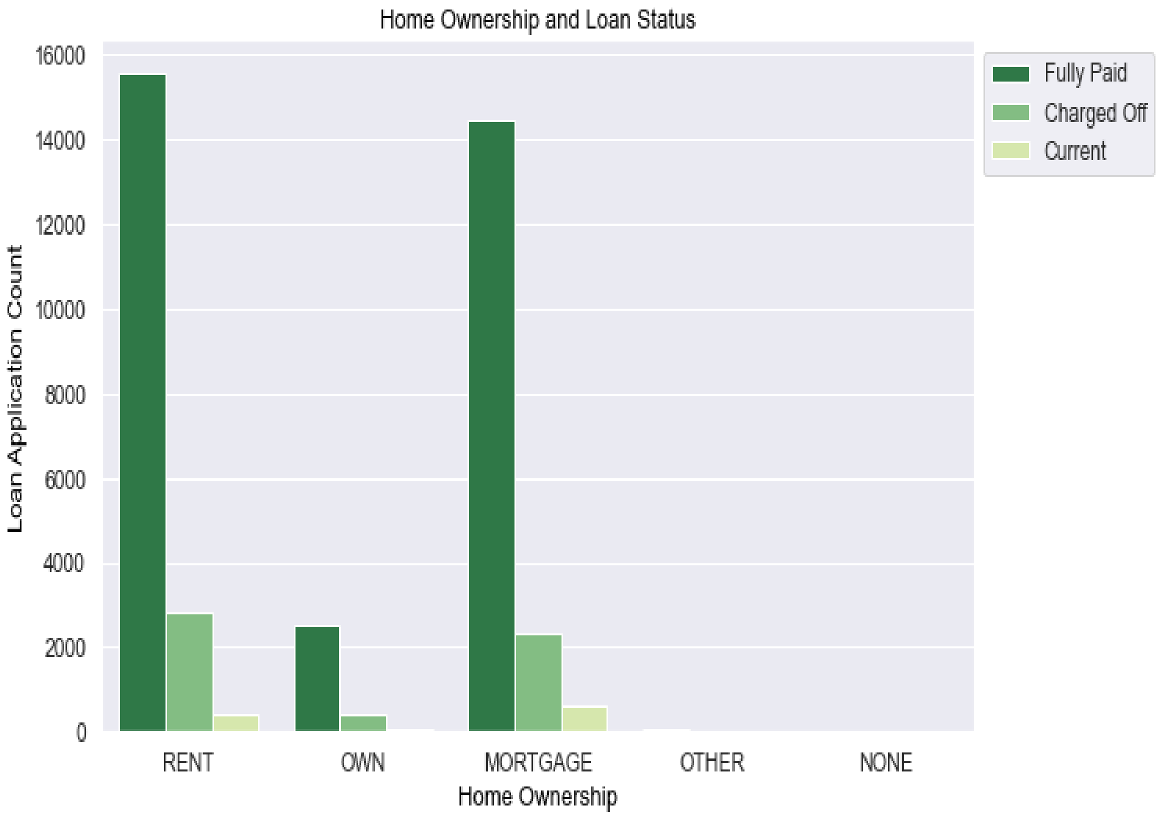
1) One who paid the loan completely has higher annual income than one who is charged off from the loan.

2) Also, the one who is having loan currently is getting higher income than one who is charged off

3) Current loan will be easily paid based on this order G > F > E > C > B > D > A

** Applicants with Grades F are vulnerable for Loan Charge Off

Analyzing loan status with Loan Application Count across Home Ownership



1) The Fully paid loan is that with most of them living in rented home or mortgaged their home.

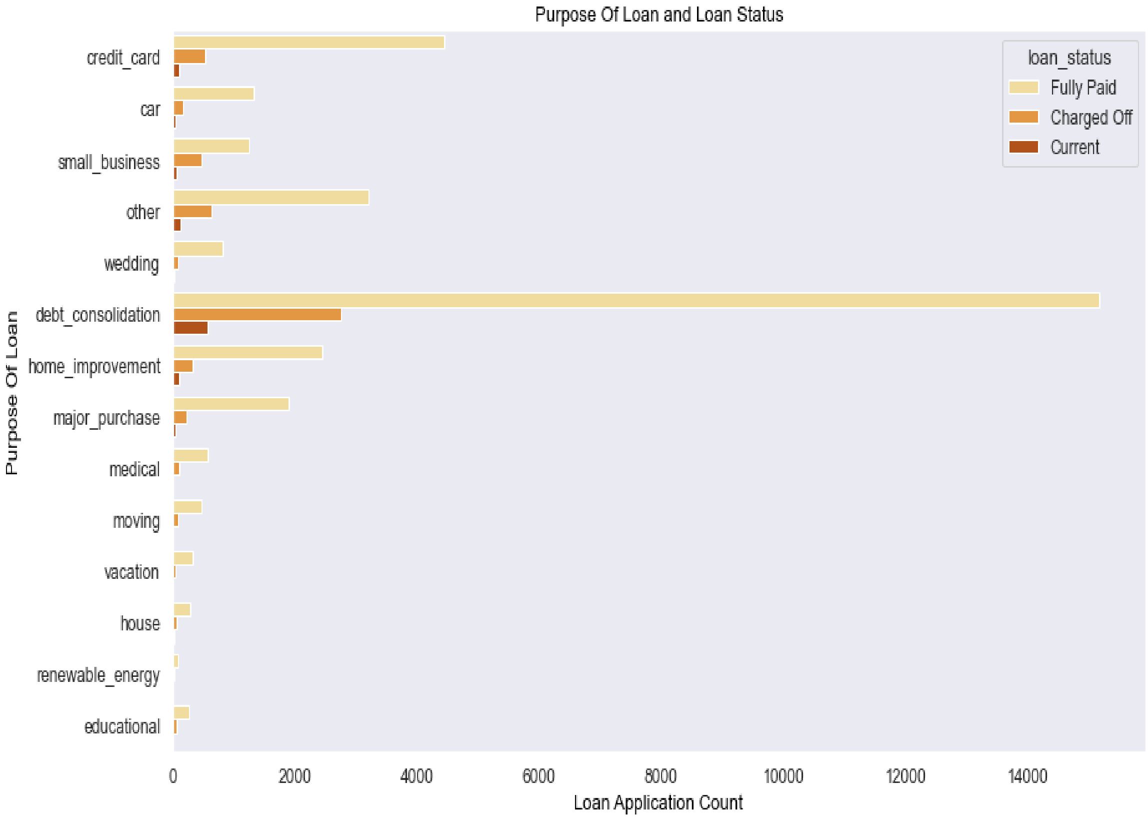
2) No current loan with Own house.

3) Charge off for applicants with rental is higher than mortgage.

4) Charge off is less with applicants who have own houses

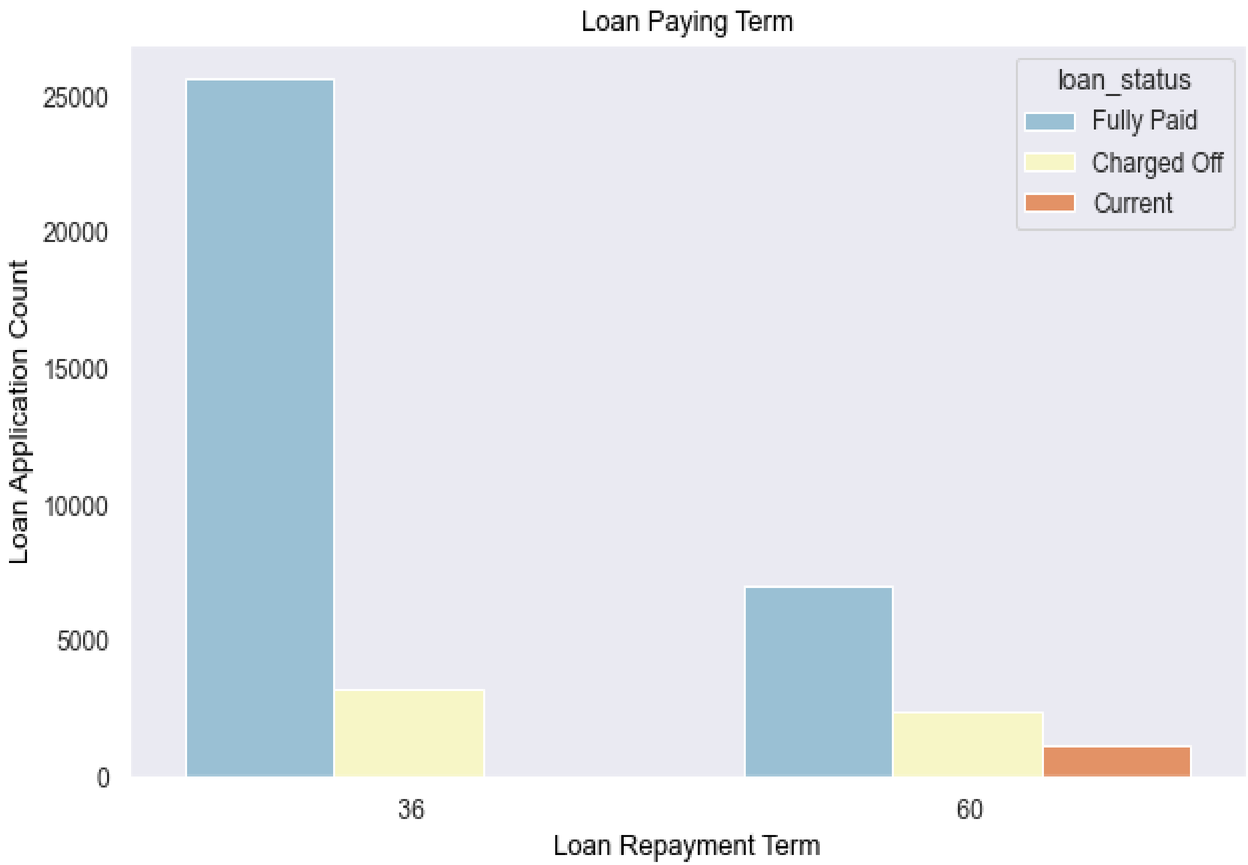
** Charge Off is more with applicant with rental home

Analyzing loan status with purpose of loan across Loan Application count



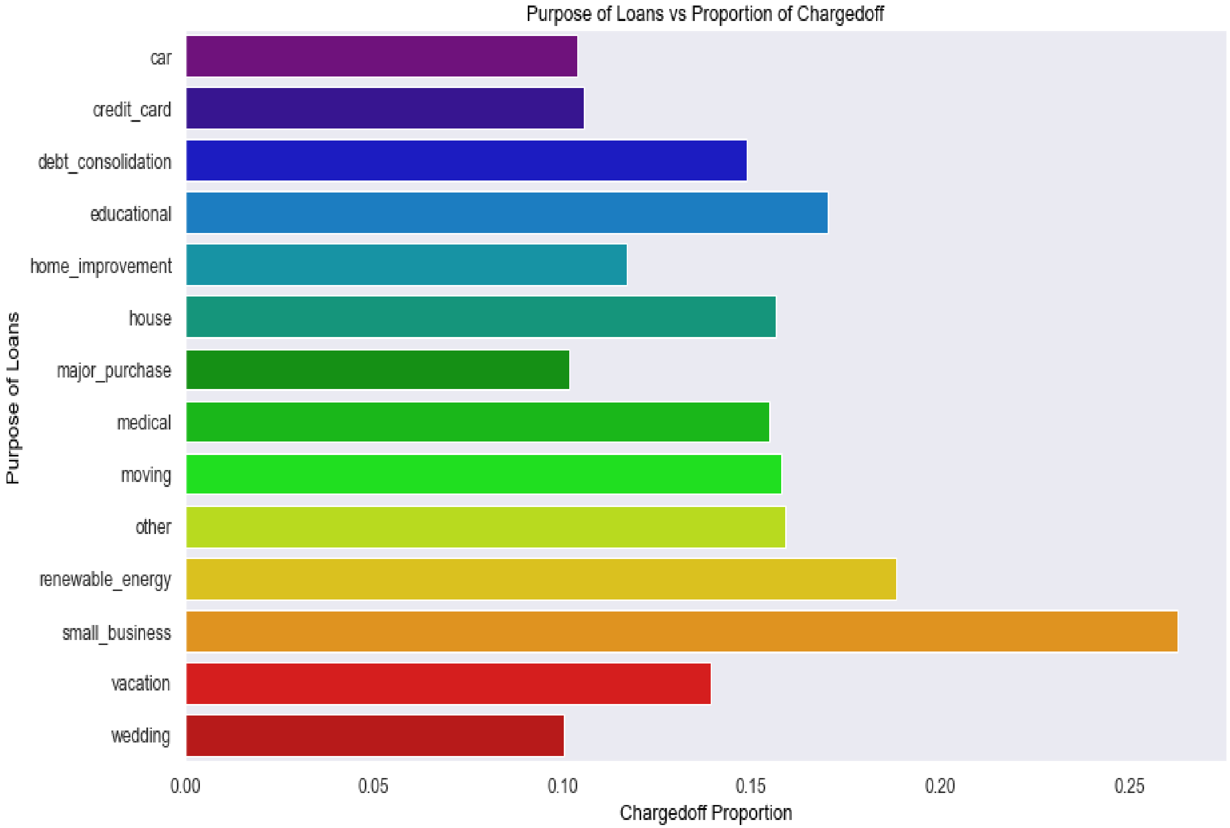
- The plot shows that most of the loans were taken for the purpose of debt consolidation and second most place goes to paying credit card bill.
- Number of charged off count also high debt consolidation , followed by credit card bills.
- But if we see the loan chargeOff proportion, small business and credit card loan purpose is more.

Analyzing loan status with Loan Application Count across Loan Repayment term



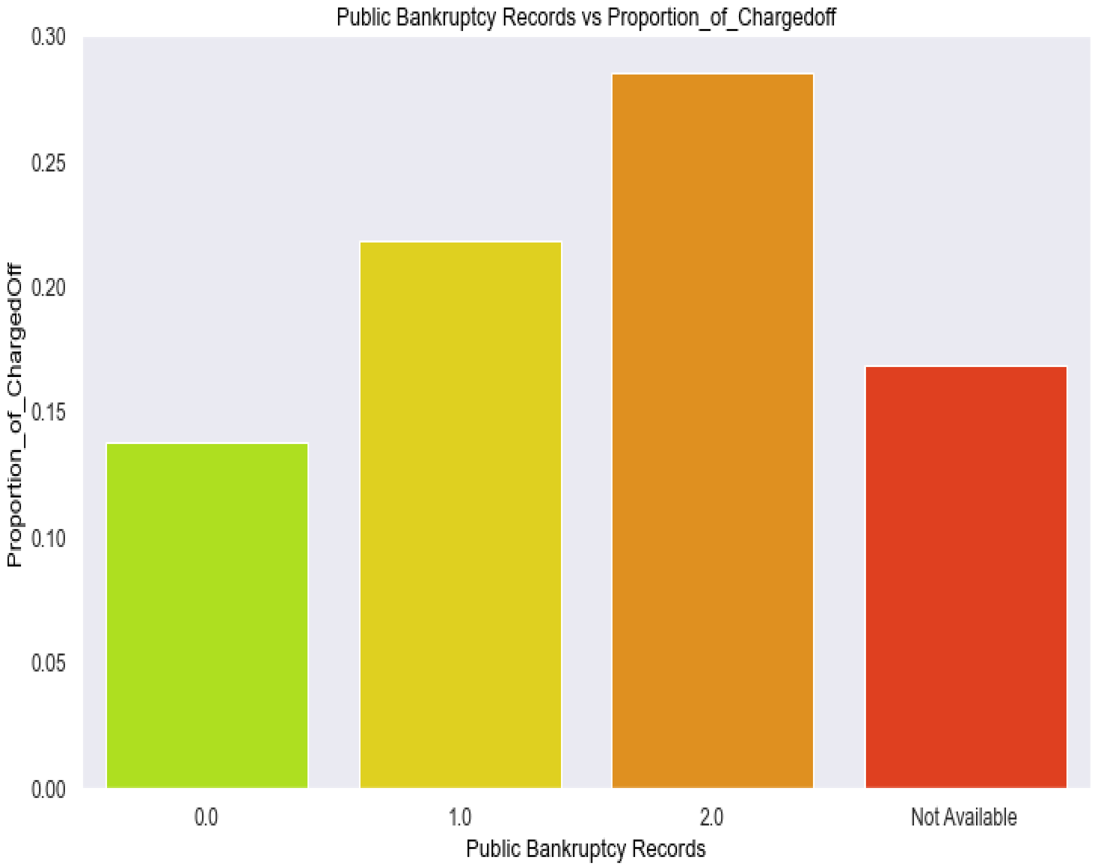
1. Loan Paying Term reduces the charge off also applicant count
2. Those who had taken loan to repay in 60 months had more % of number of applicants getting charged off as compared to applicants who had taken loan for 36 months

Purpose of Loan Vs ChargeOff Proportion



From the above analysis it is evident that if the loan is provided for small business purpose, the charged off proportion is more

Public Bankruptcy Records Vs ChargeOff Proportion



Those who have public bankruptcy records more than 1 have more chargedOff proportion Public Bankruptcy is directly proportinal to high risk of chargedOff

Conclusion

From the above analysis it is evident that ChargedOff is more with following reason

1) Less Loan Repayment term

2) If purpose of loan is for small business and for credit card consolation

3) With applicant with rental home

4) Grades of "F" and "G" have very high chances of charged off.

5) Grades of "A" have low chances of charged off.

6) Employment length also influence the loan Chargeoff, the person with less experience are more vulnerable to get ChargedOff their loan.