

Lending Club Case Study

CASE STUDY GROUP:

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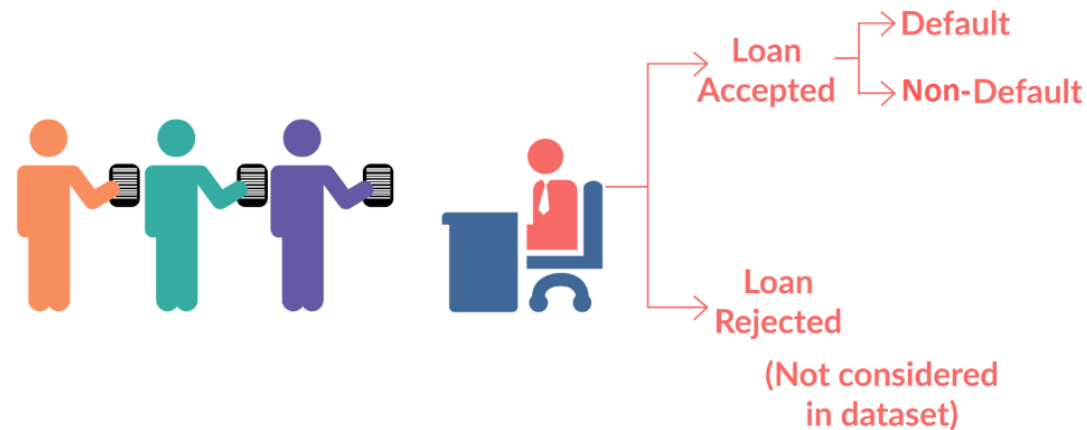
Problem Statement:

You work for a consumer finance company which specializes in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision:

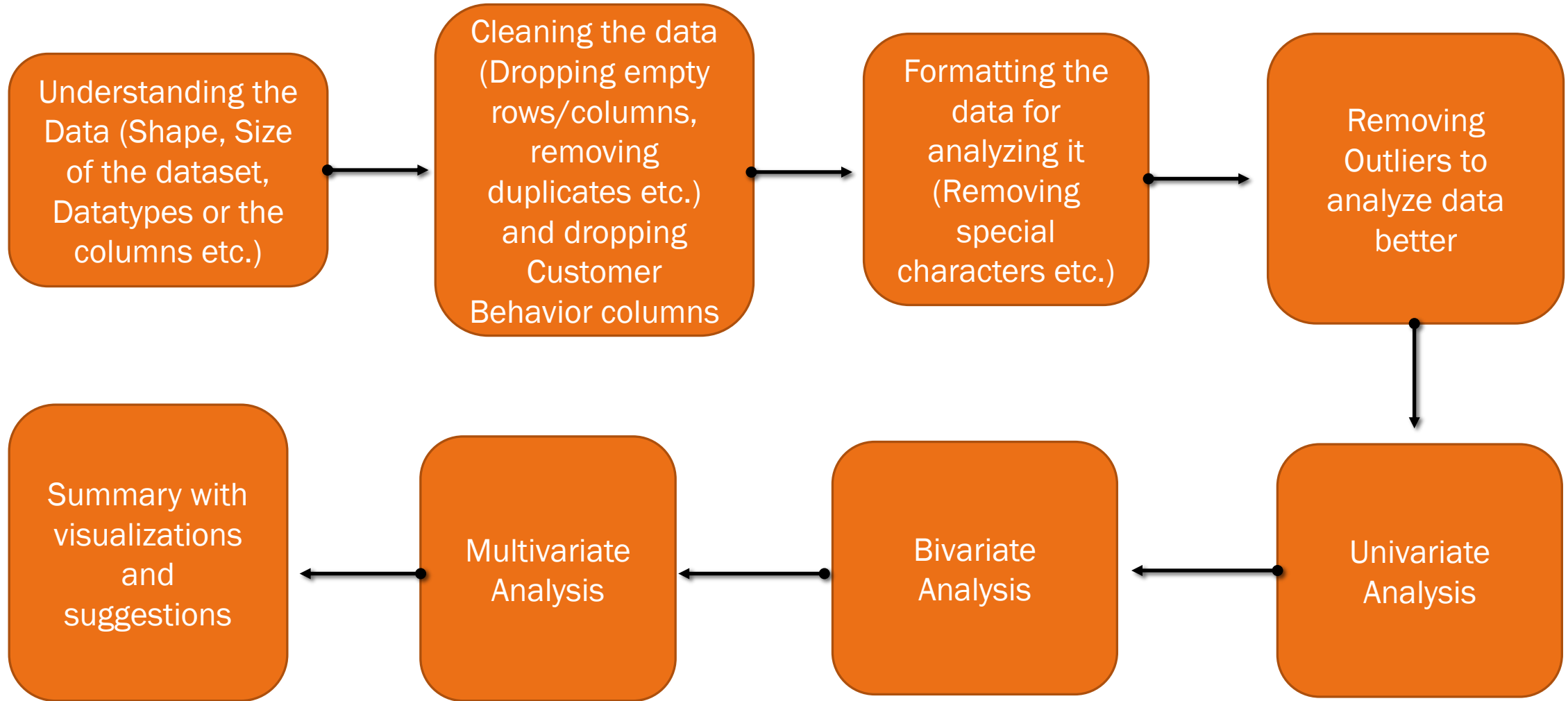
- If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company.
- If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company

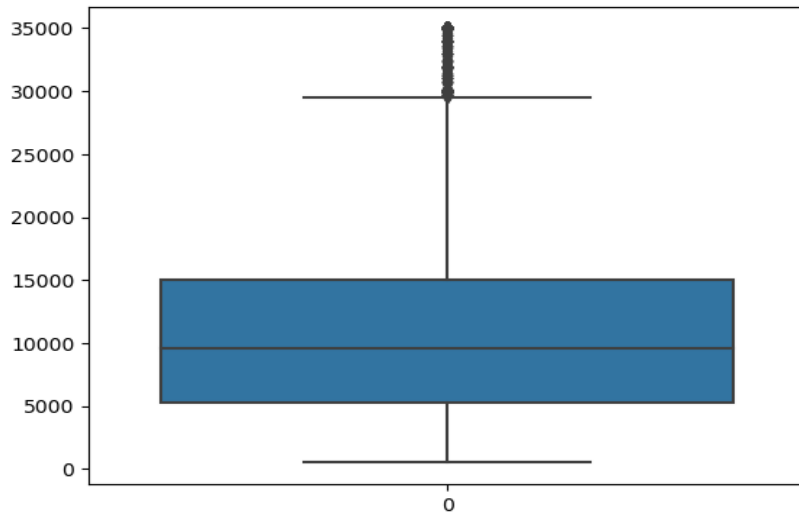
The aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

LOAN DATASET

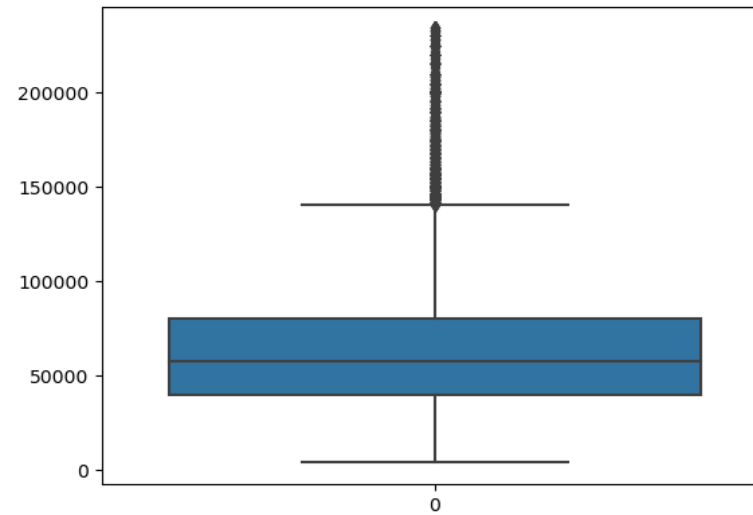


Overall approach for analysis:

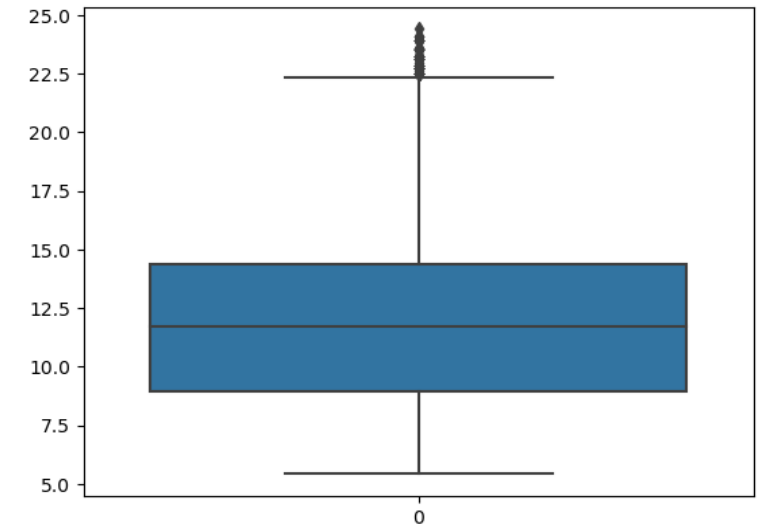




Loan Amount

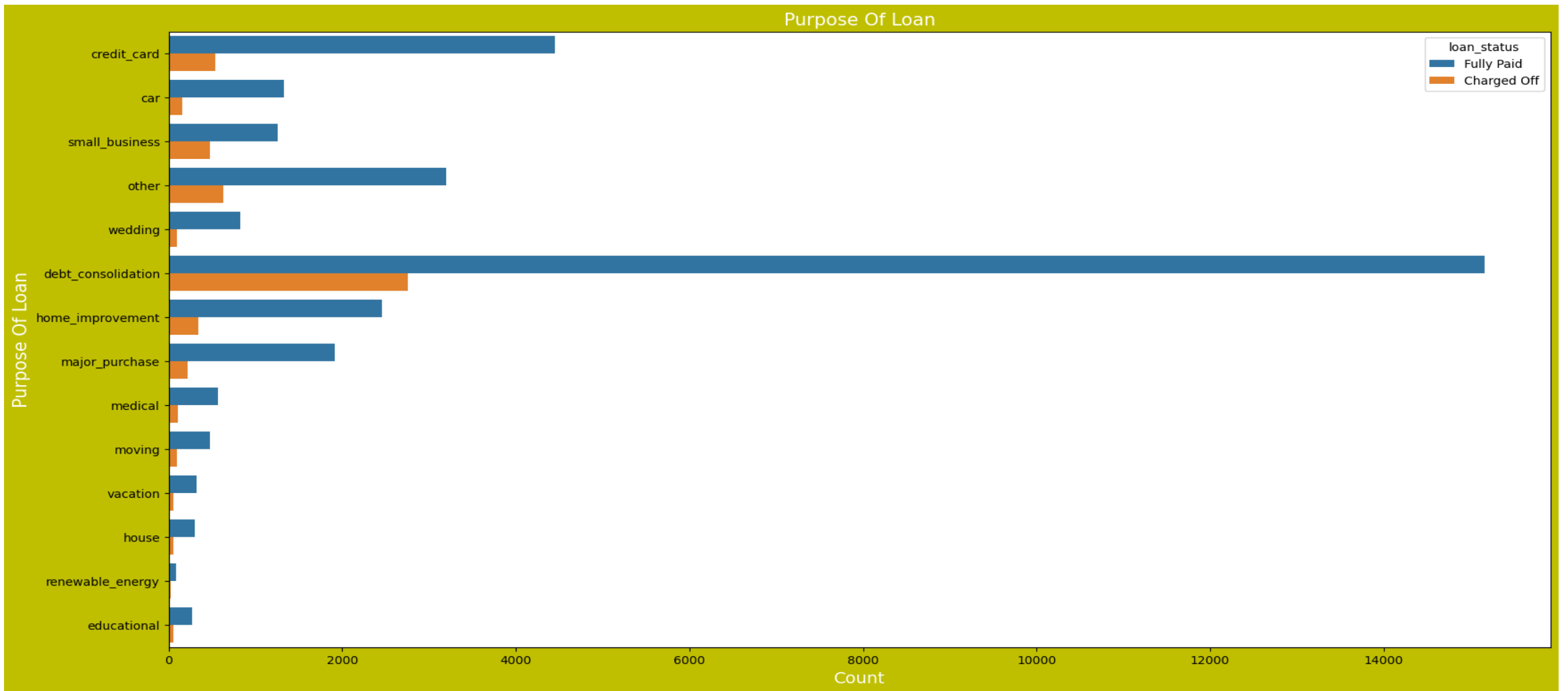


Annual Income



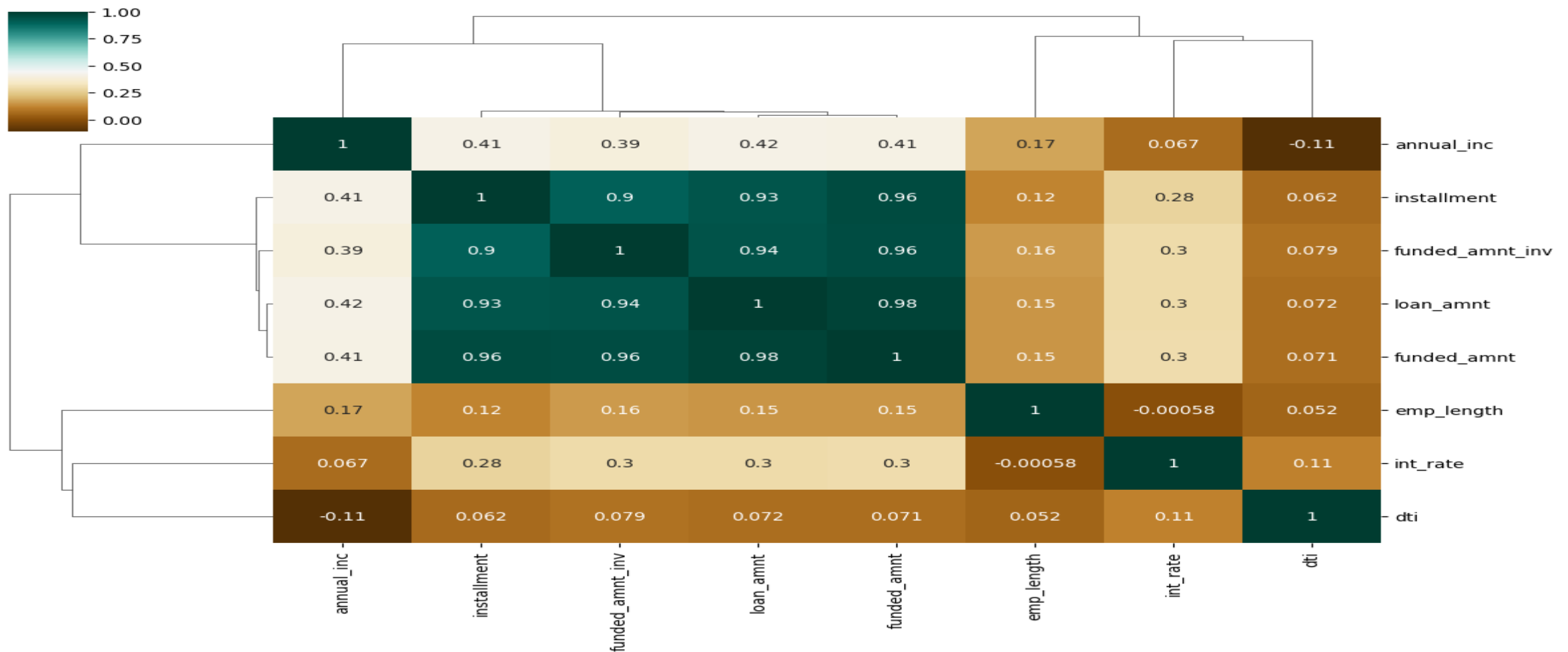
Interest Rate

- Most of the loan amount lies between 5000 and 15000
- Most of the borrower's annual incomes lies between 40000-80000
- Interest rate for maximum borrower's lies between 9-15%



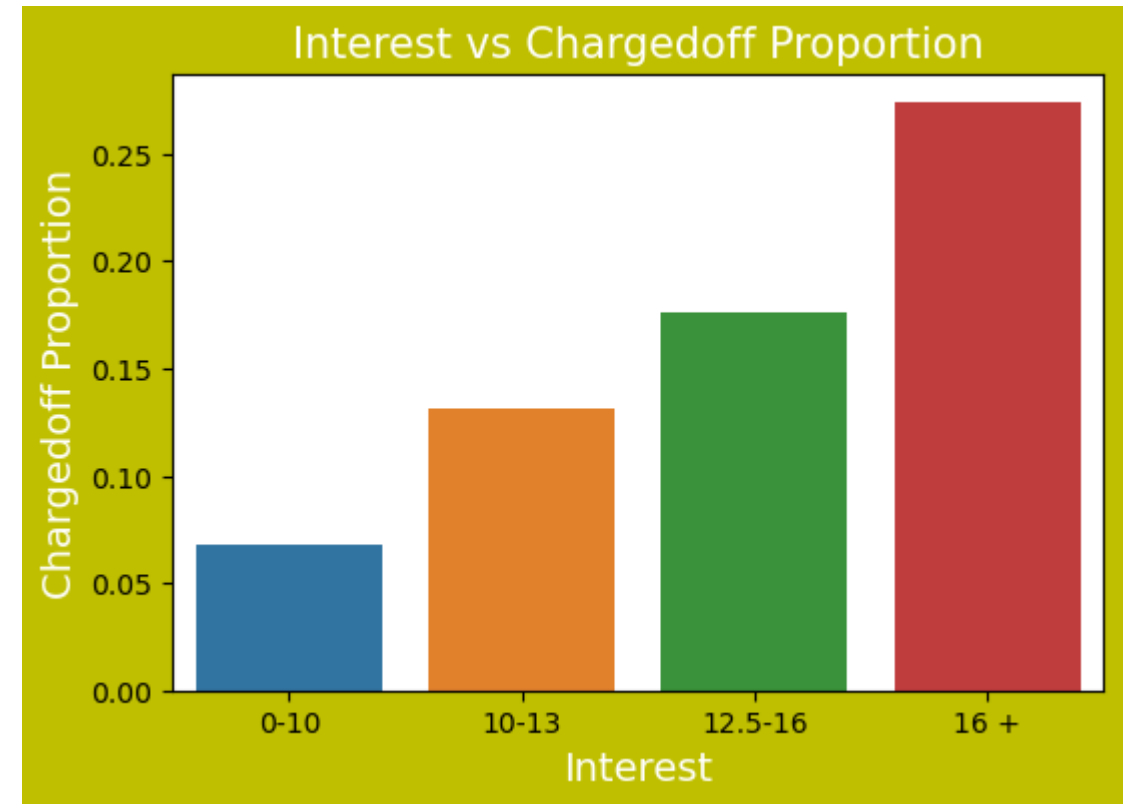
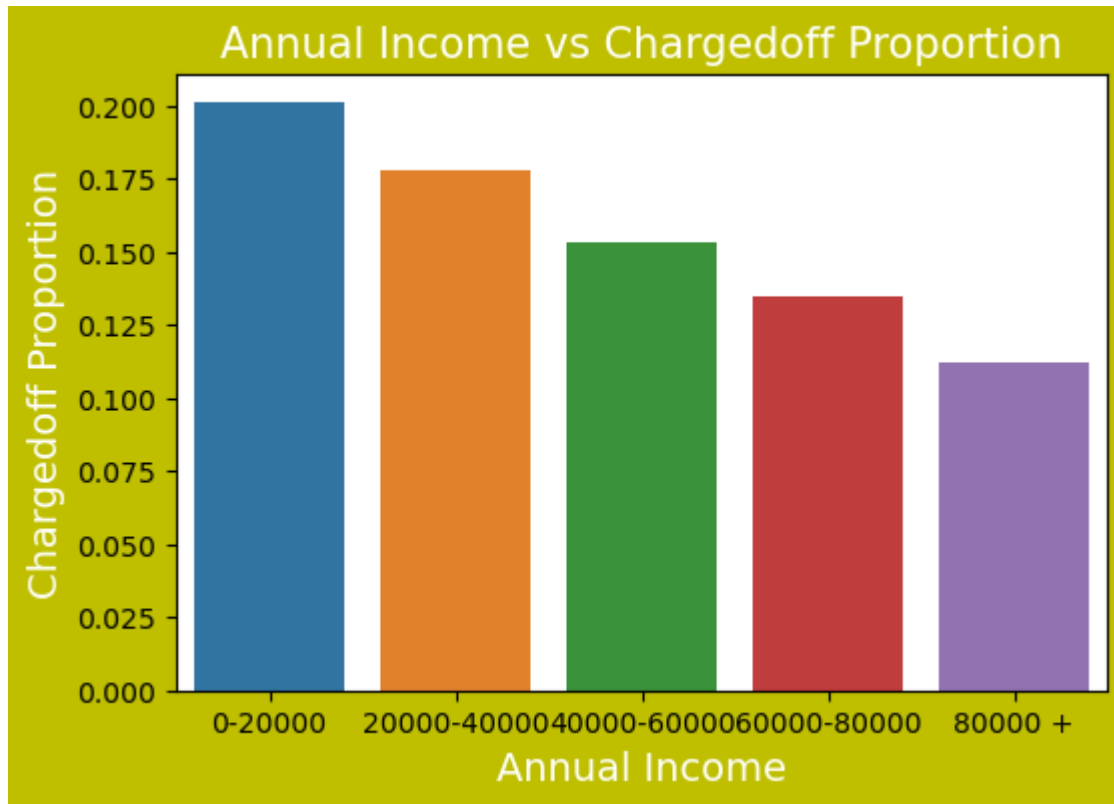
Purpose of Loan:

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



Correlation Matrix:

Loan amount, investor amount, funding amount are strongly correlated. Annual income with DTI(Debt-to-income ratio) is negatively correlated which means when annual income is low DTI is high & vice versa. Positive correlation between annual income and employment length which means more the work experience more is the annual income.



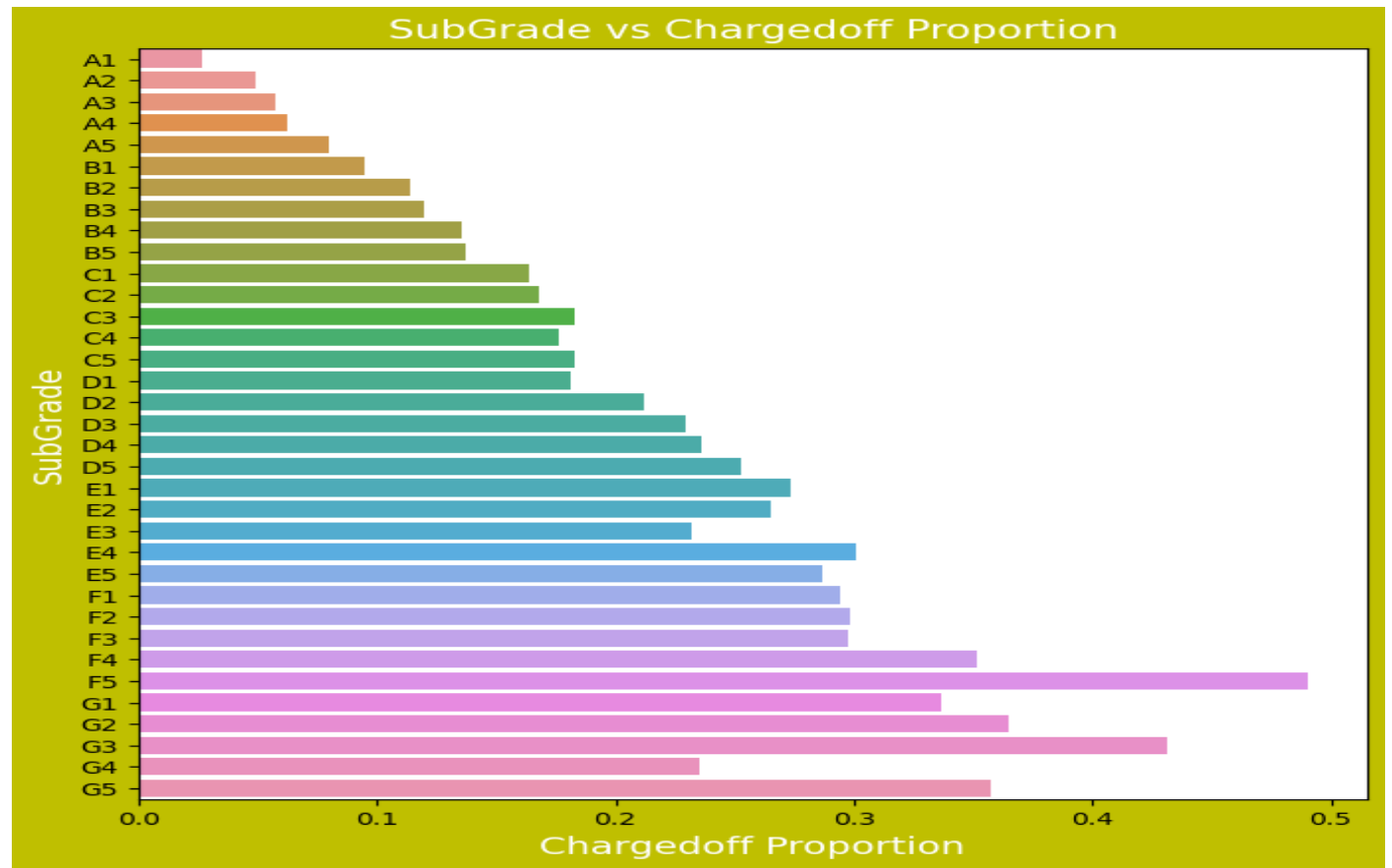
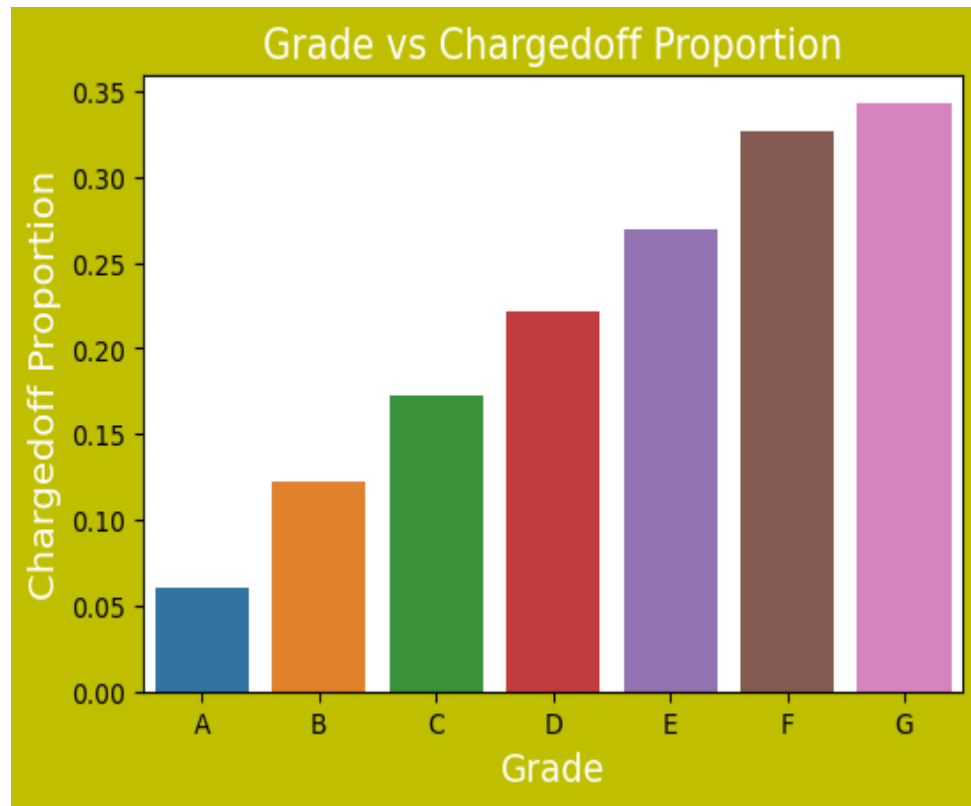
Annual Income Vs Charged-off Proportion:

The above plot shows that lower the annual income greater is the chance of getting defaulted(charged off).

Interest Rate Vs Charged-off Proportion:

The above plot shows that greater the interest rate, greater is the chance of getting defaulted(charged off).

Interest rate more than 16% has good chances of charged off as compared to other category interest rates.

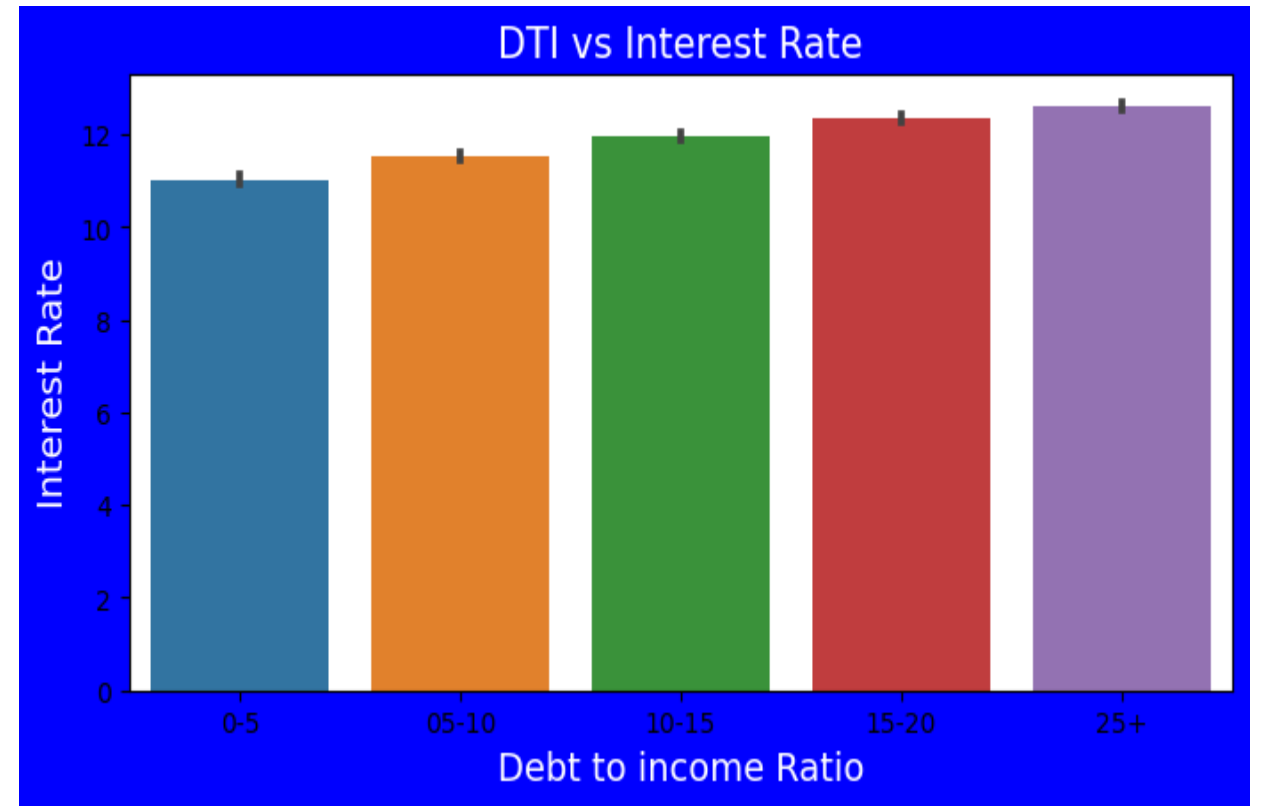
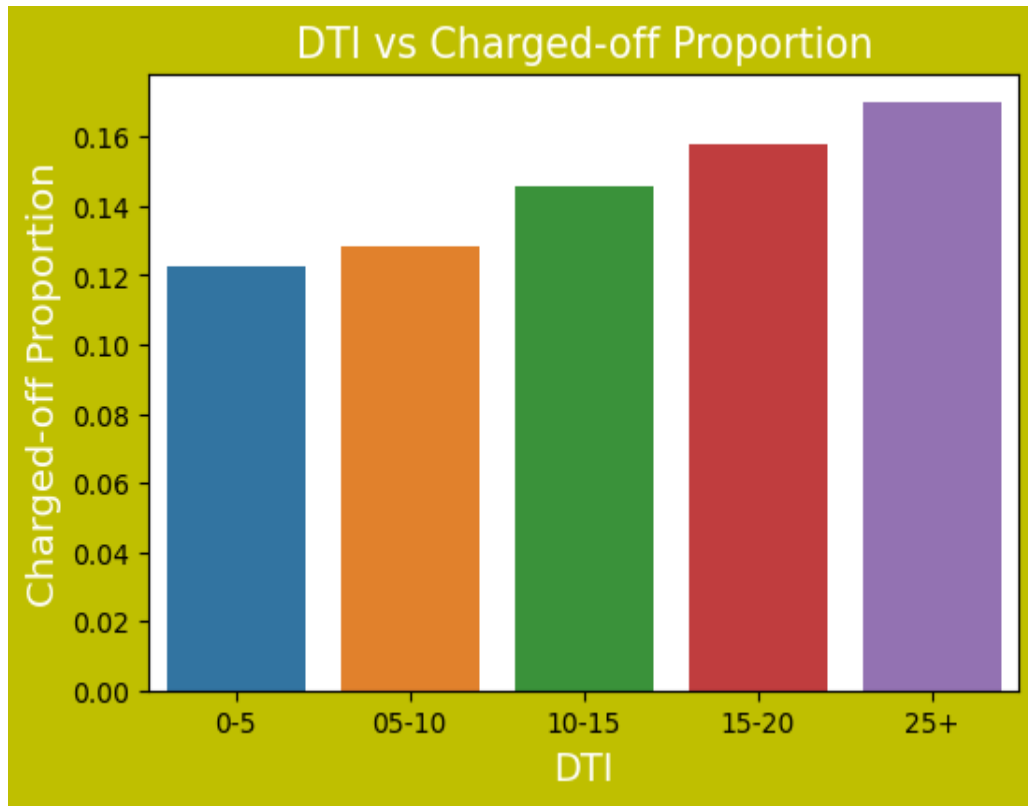


Grade Vs Charged-off Proportion:

The above plot shows that highest chance of 'charged off' is for grade 'G'. Chance keeps increasing from A to G. Grade "A" has very less chances of charged off while Grade "F" and "G" have very high chances of getting charged off.

Sub-Grade Vs Charged-off Proportion:

The above plot shows that highest chance of 'charged off' is for sub grade 'F5', 'G2' and 'G3'.

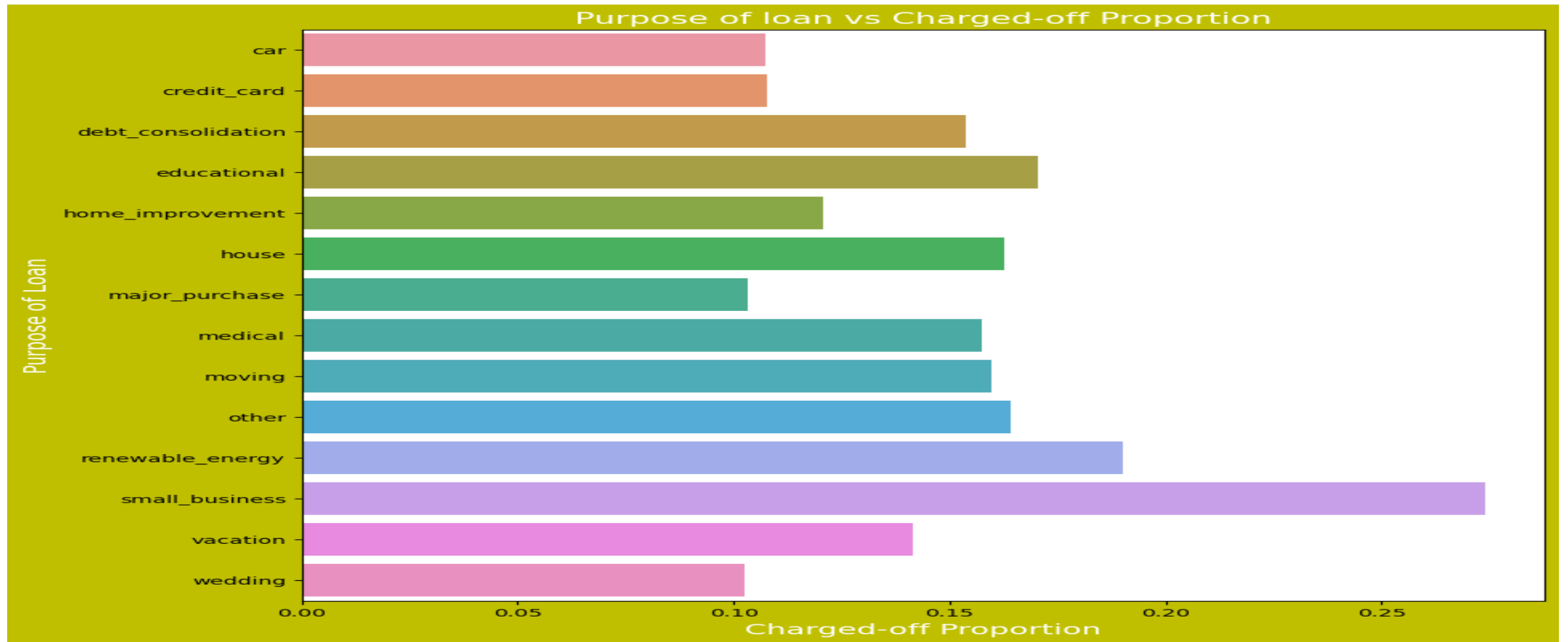


DTI Vs Charged-off Proportion:

Applicants with low DTI have low chances of getting Charged Off. Above plot shows slight increase in Charged Off rate with increase in DTI.

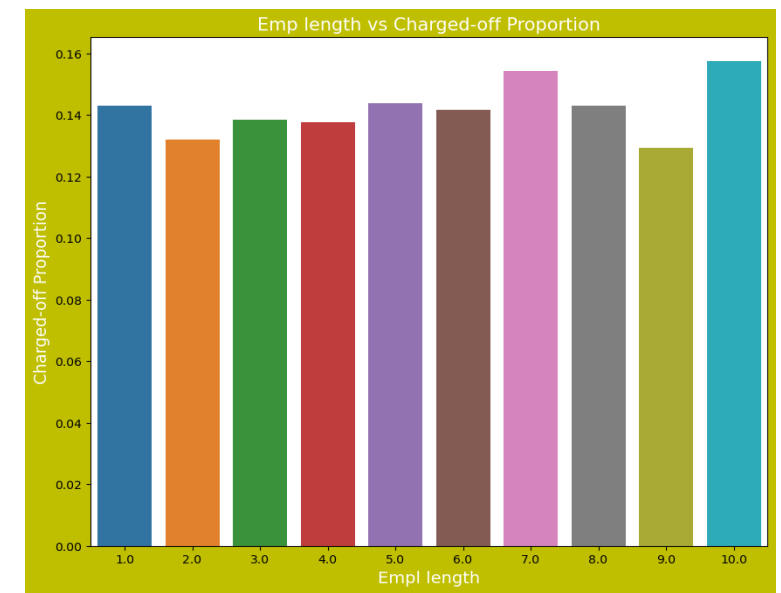
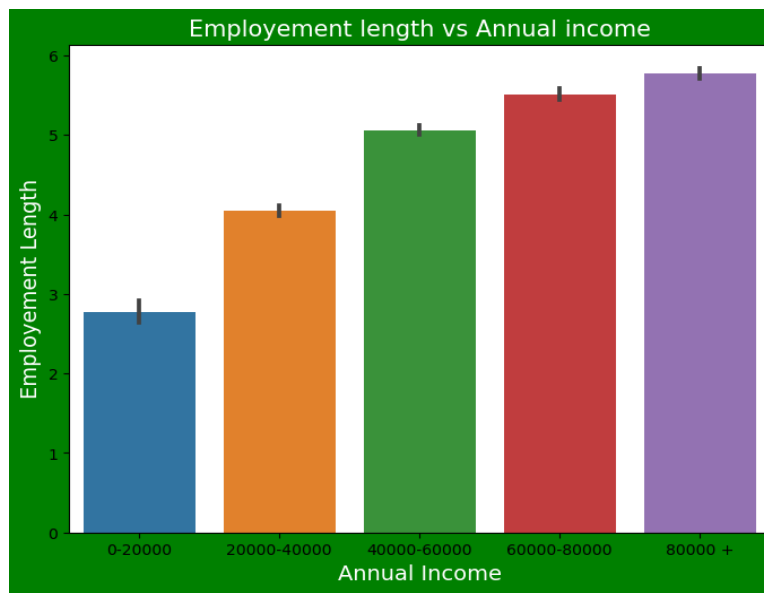
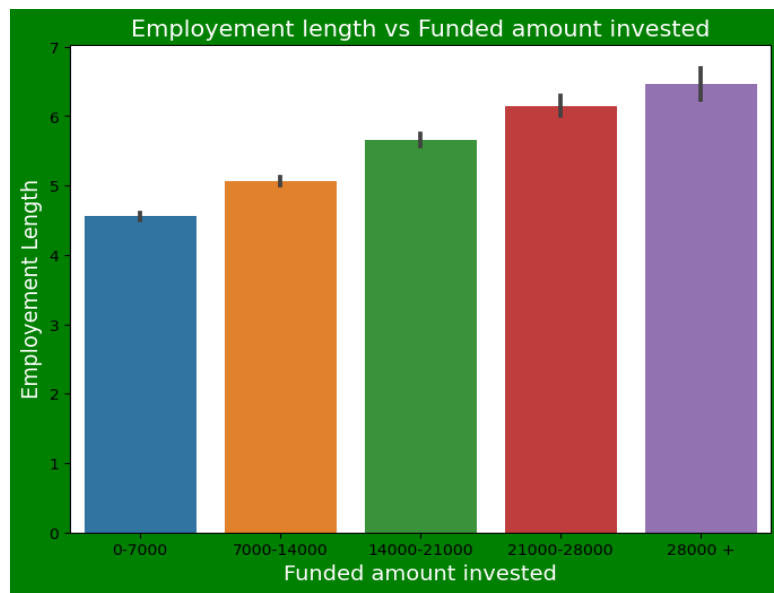
DTI Vs Interest Rate:

If your DTI is low you may get a lower interest rate. Above plot shows slight increase in interest rate with increase in DTI.



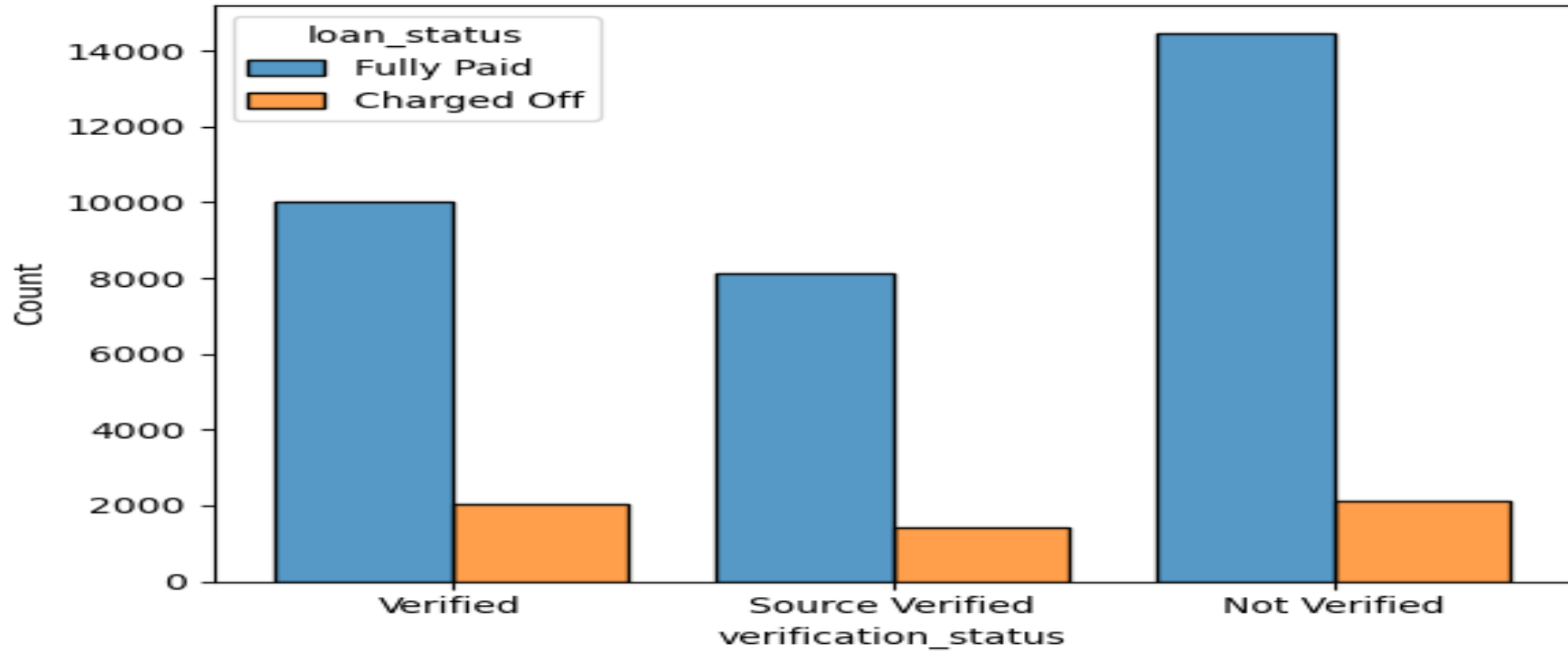
Purpose of Loan Vs Charged-off Proportion:

The above plot shows that defaulter chance is more for loan taken for 'small_business'.



Employment Length Vs Funded Amount Invested & Employment Length Vs Annual Income:

The above two graphs shows that more the employment length(experience) more will be the annual income and hence more the funded amount invested. This might be the reason of more charged off percentage for more employment length (third graph).



Verification Status Vs Loan Application Count:

Charged offs are more for 'Not verified' and 'Verified'. Source verified has less number of charged offs.

Summary & Suggestions:

Based on the analysis done, below points should be taken care while granting a loan:

- Lower the annual Income higher are the chances of getting charged-off.
- High interest rate is major contributor in loans getting charged off.
- Charged off proportion increases with grades moving from “A” towards “G”.
- Applicants with low DTI have low chances of getting Charged Off. Higher the DTI, higher will be the interest rate.
- Small Business Applicants have high chances of getting charged off.
- More the employment length (experience) more will be the annual income and hence more amount can be funded to the applicant.
- Charged Off loans are more for loans where Loan term is 36 months which means people tend to charge off when the loan term is less.
- More number of charged offs were in December, May and September. In these months interest rates were also slightly higher.

Suggestions to Lending Club:

- Loans for Small Business Applicants should be checked properly.
- Loan approval for F & G grades loans should be avoided or smaller loan amount can be granted with higher interest rate.
- Lower annual income applicants should not be given bigger loan amounts and should be charged higher interest rates.
- Loan should not be approved for applicants who doesn't have a source of income. Applicants with Source verified are safer while providing loans.
- It is risky to give loan for people with ownership type 'Rent' and 'Mortgage'.