

Lending Club Case Study

Group Id – 100093

Contributors:- Merson Sandeep, Paul Dhrubajyoti

Problem Statement

You work for a consumer finance company which specialises 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

There are four major parts that are needed to be done for this case study.

1. Data Understanding
2. Data Cleaning
3. Data Analysis
4. Recommendations

Data Understanding

We have gone through the loan dataset and picked up the important variables which needs to be cleaned and analysed

List of Important Variables:

- Loan amount
- Term
- Interest Rate
- Grade
- Sub grade
- Annual Income
- Purpose of Loan
- Employment Length
- Home ownership
- Verification status

Data Cleaning

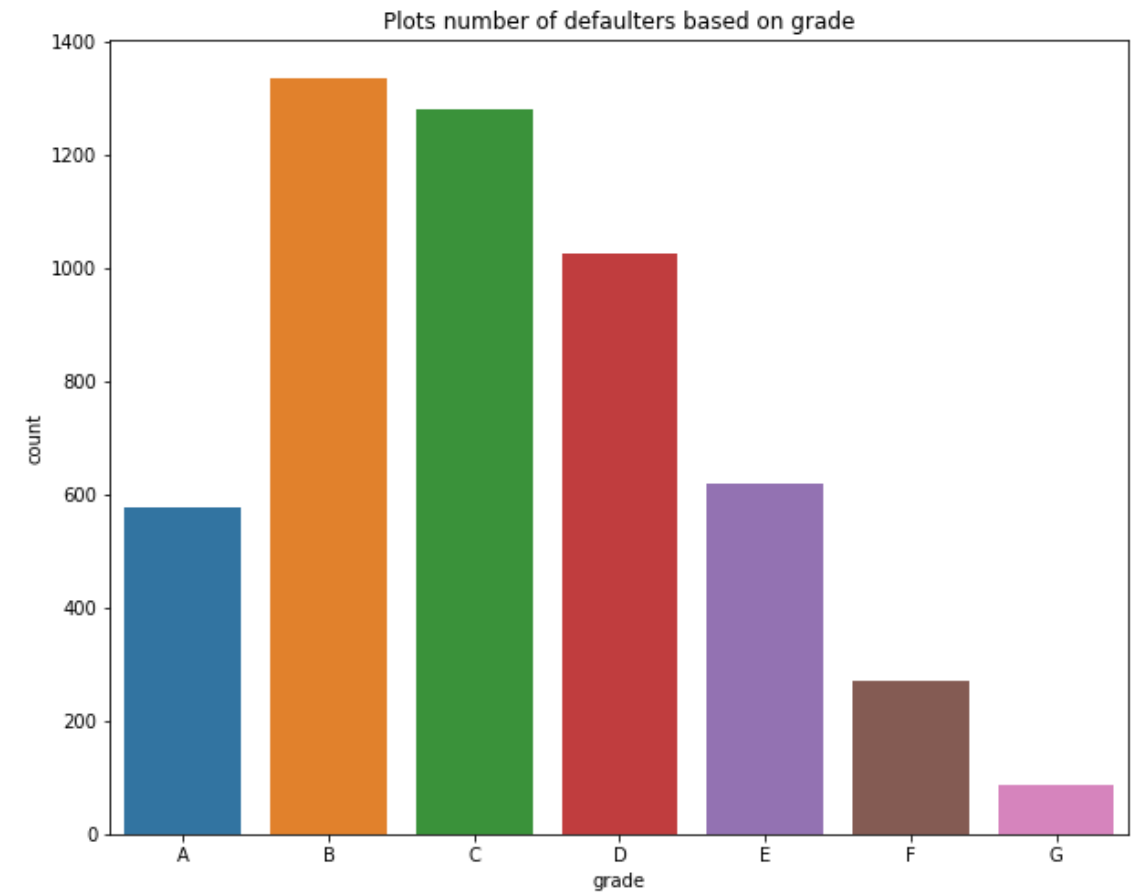
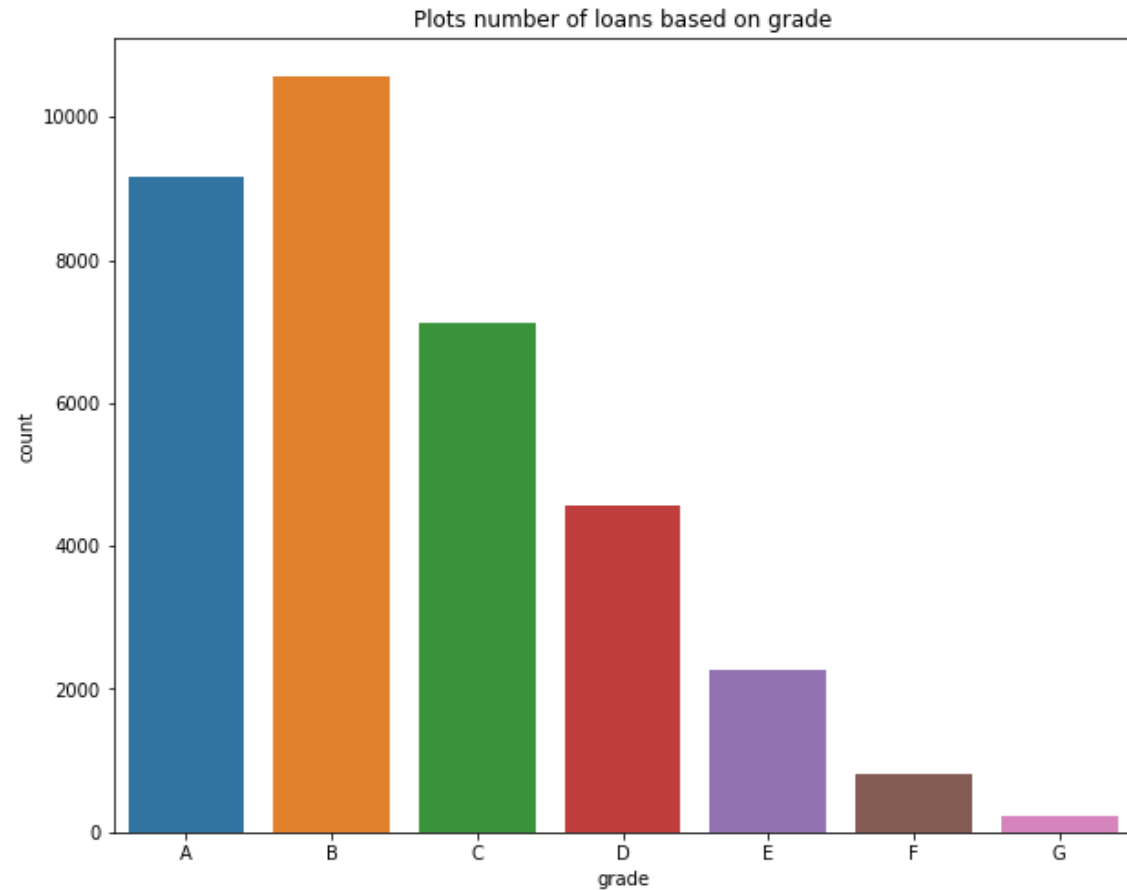
- Cleaning of the data is very important step before we start analyzing by identifying the missing values and removing it.
- Cleaned up the unnecessary columns by dropping it.
- We found out more columns with null values hence dropped that column.
- Corrected the employment length column by filling with mode value.
- Created new columns by performing binning
- Removed unwanted characters for columns to have a clean data
- Partitioned month and year from the issue_d column
- In the column loan_status, the value current denotes neither fully paid nor defaulted. So we got rid of this value as well.
- Treated the outliers for annual income column

Observation [Points to Investor]

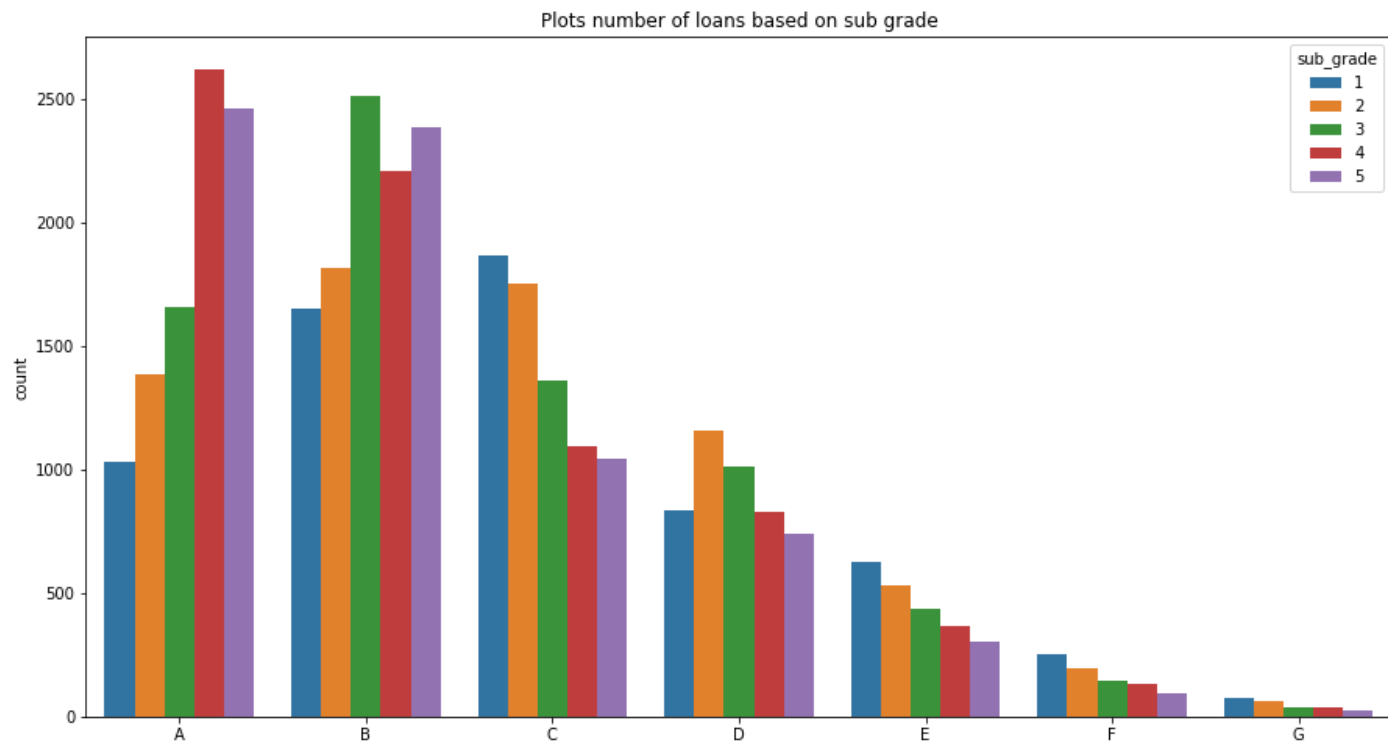
- Loan applicants with grade 'B' and sub level 'B5'
- Applicants having RENT as home ownership
- Defaulters are more who opt for 36 months term
- Applicants with verification status not verified
- Applicants whose interest rate in the range 9%-12%
- Applicants whose annual income is in the range 39K-55K
- Defaulters are more where the loan is issued on the month of Dec
- Every year there is a spike of 50% in defaulters
- Applicants with purpose 'Debt_consolidation'
- Applicants with employment length of 10 years

Data Analysis and Visualization

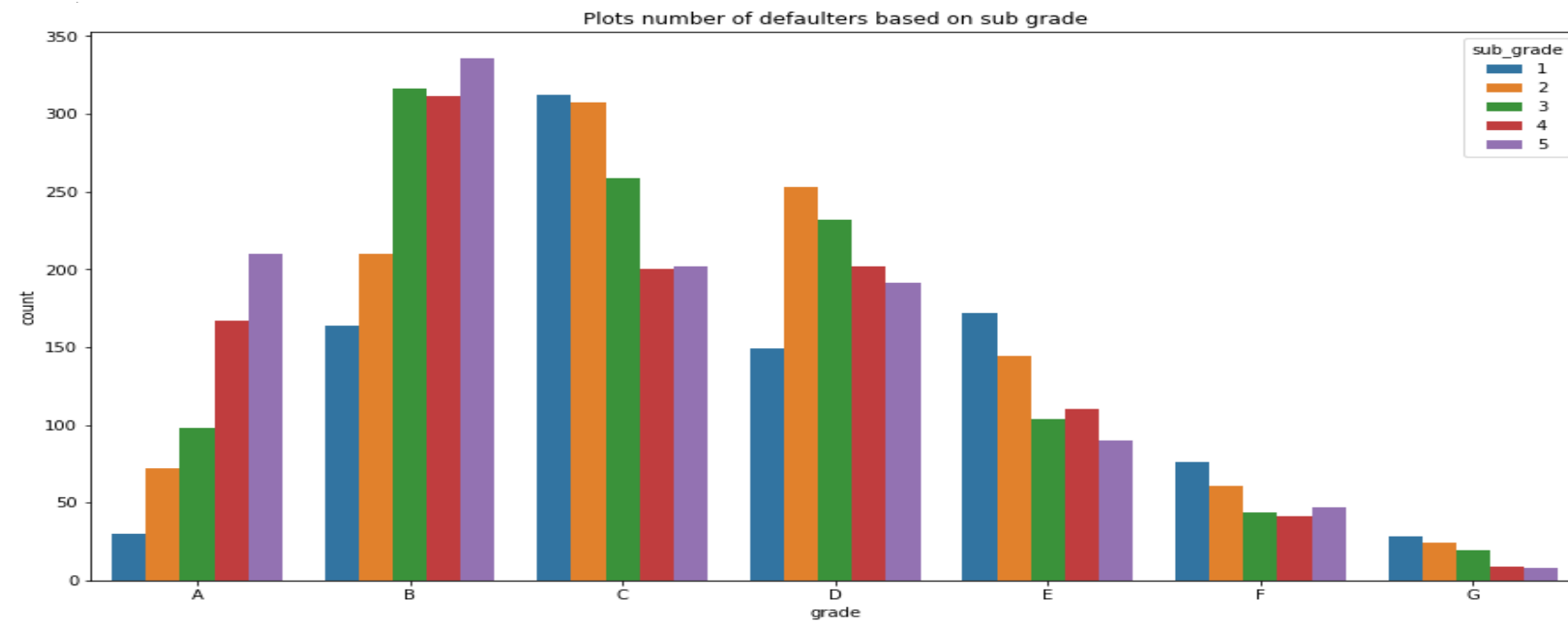
Please find the plots which we have created for analysis by visualizing it.

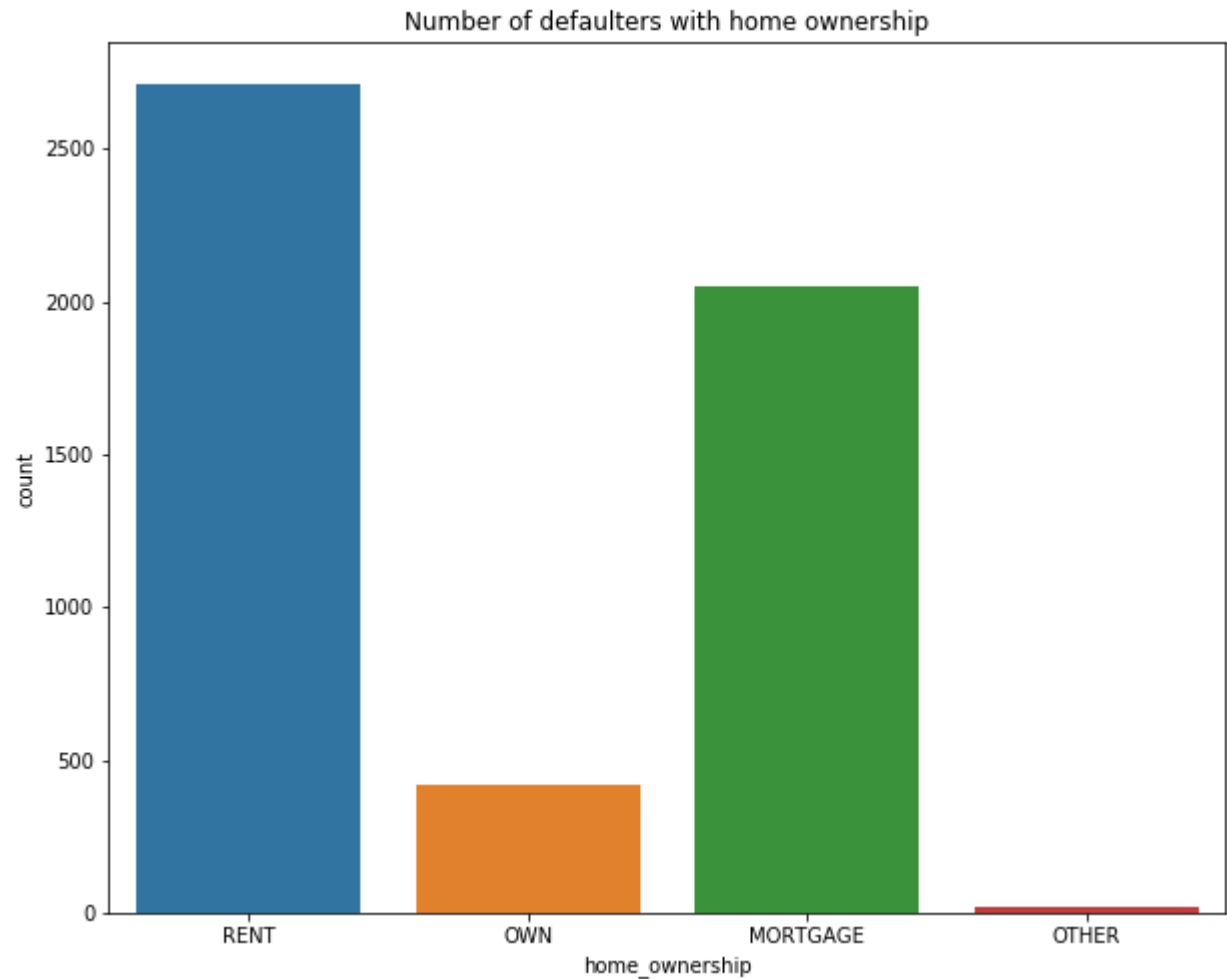
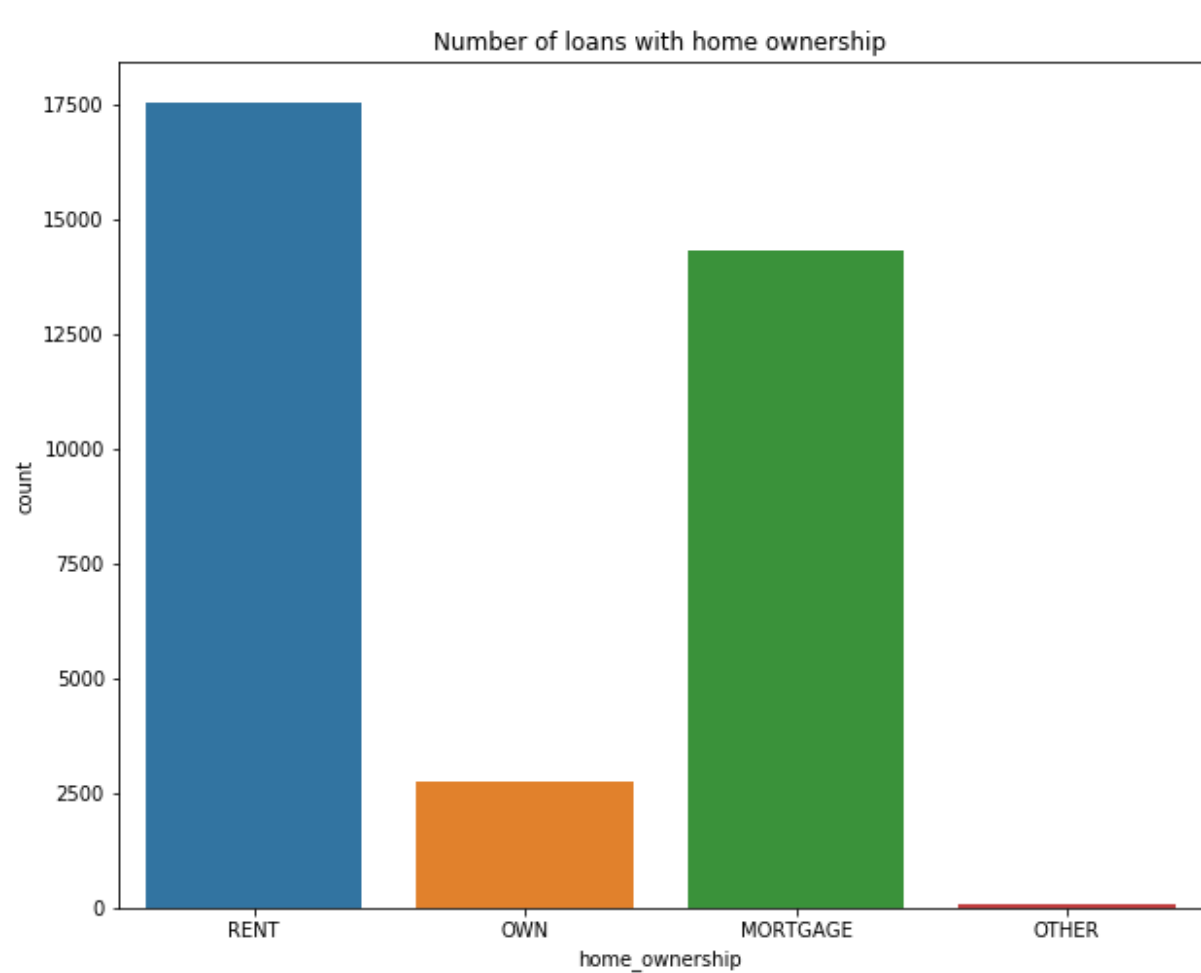


Observations :- Loan applicants with grade 'B'



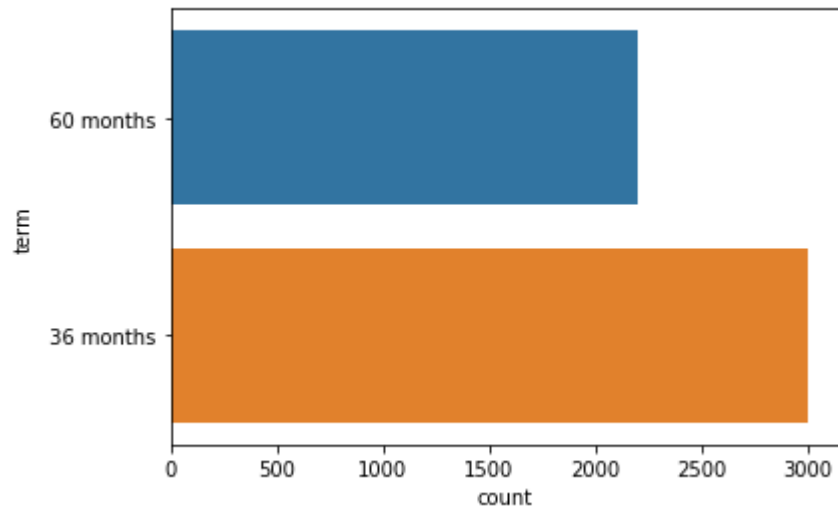
Observations :- Loan applicants with sub level 'B5'



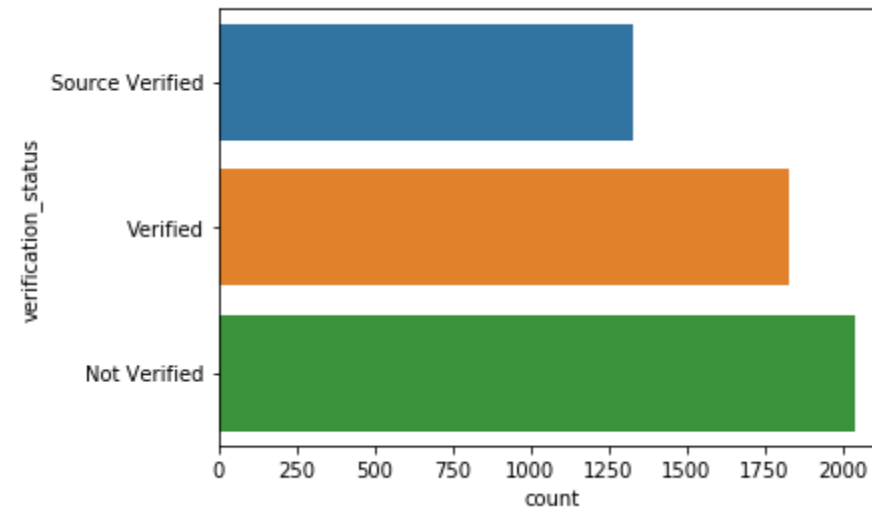


Observations :- Applicants having RENT as home ownership

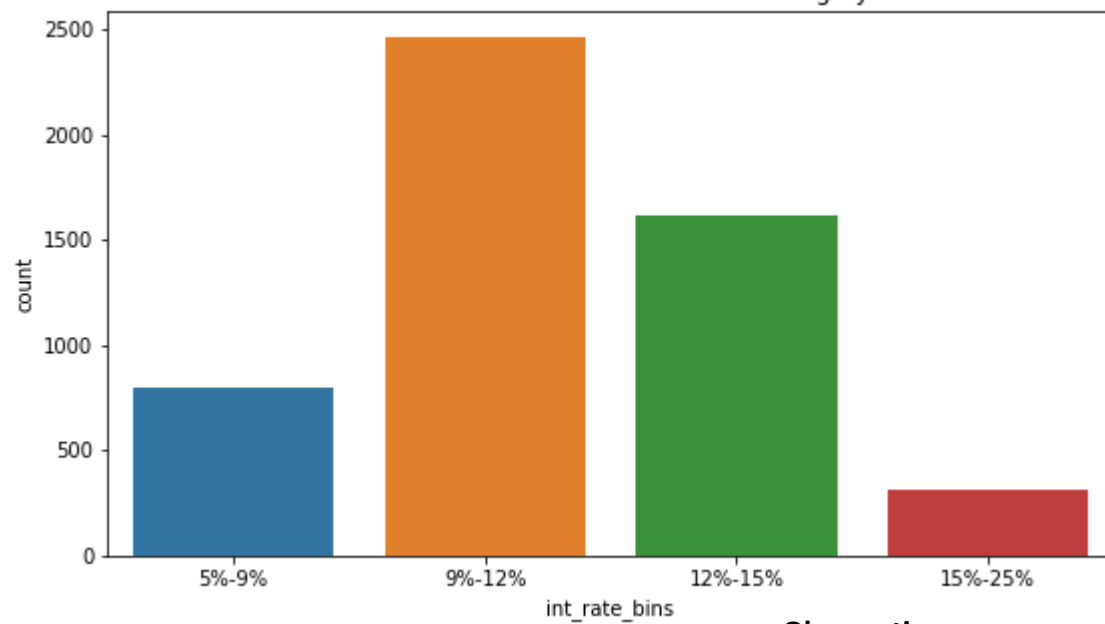
Defaulters based on loan terms



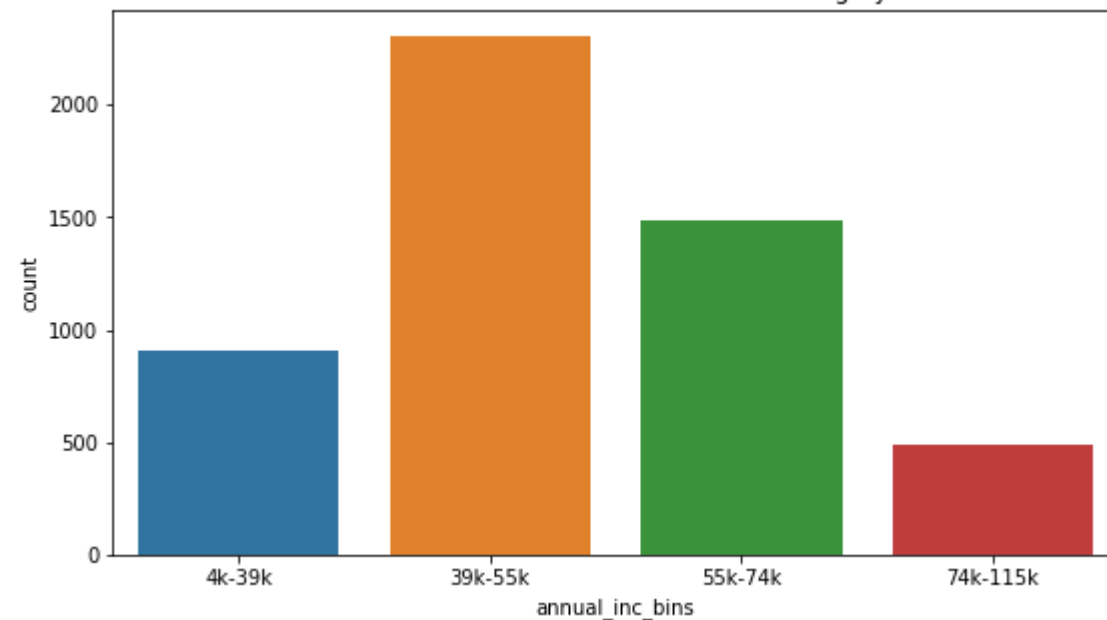
Defaulters based on verification status



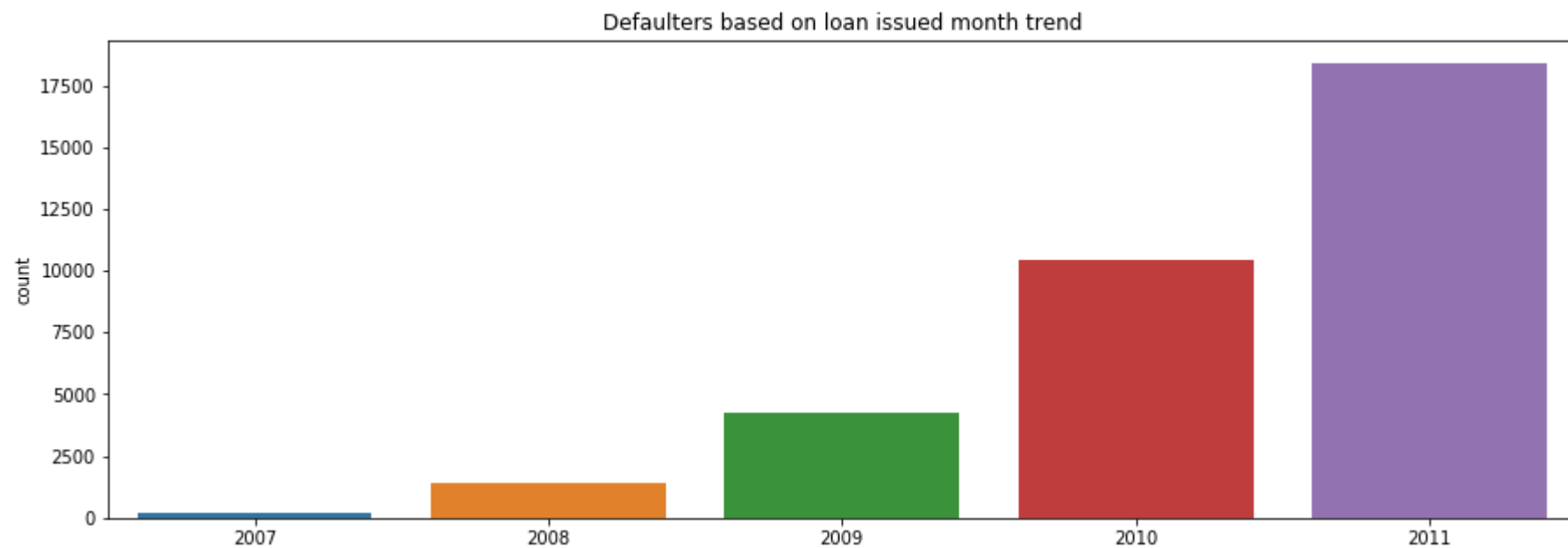
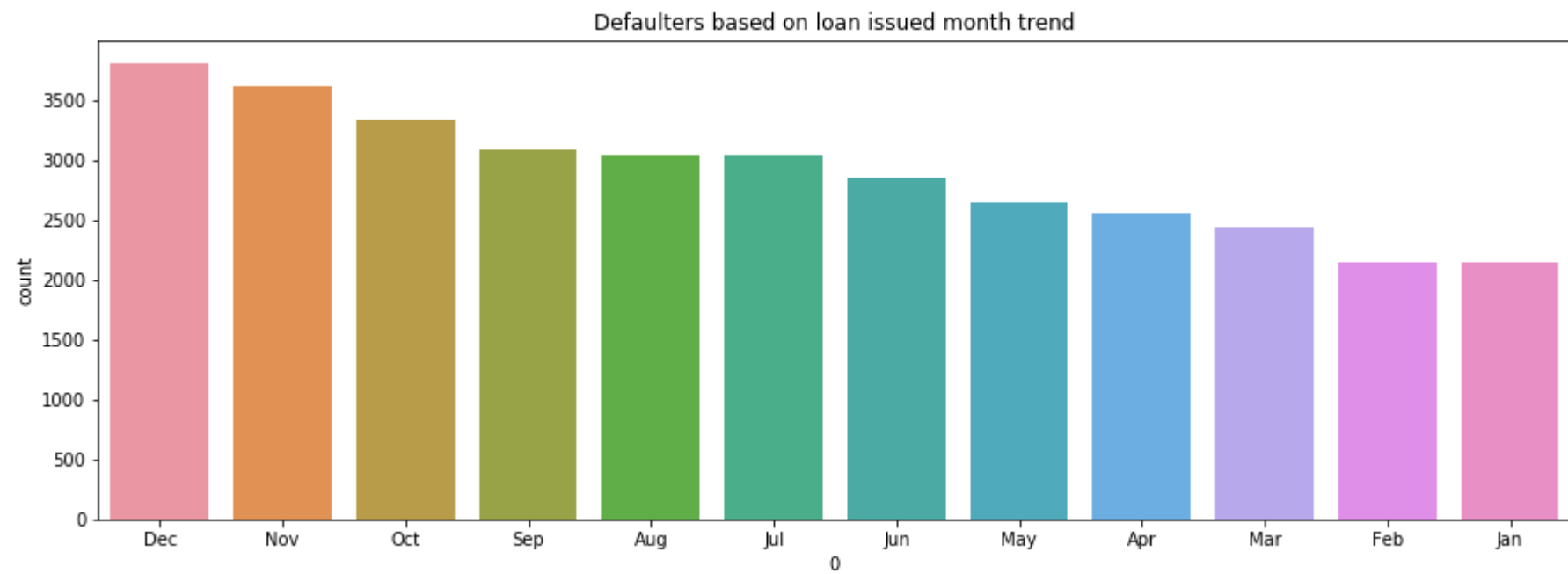
Defaulters based on interest rate category



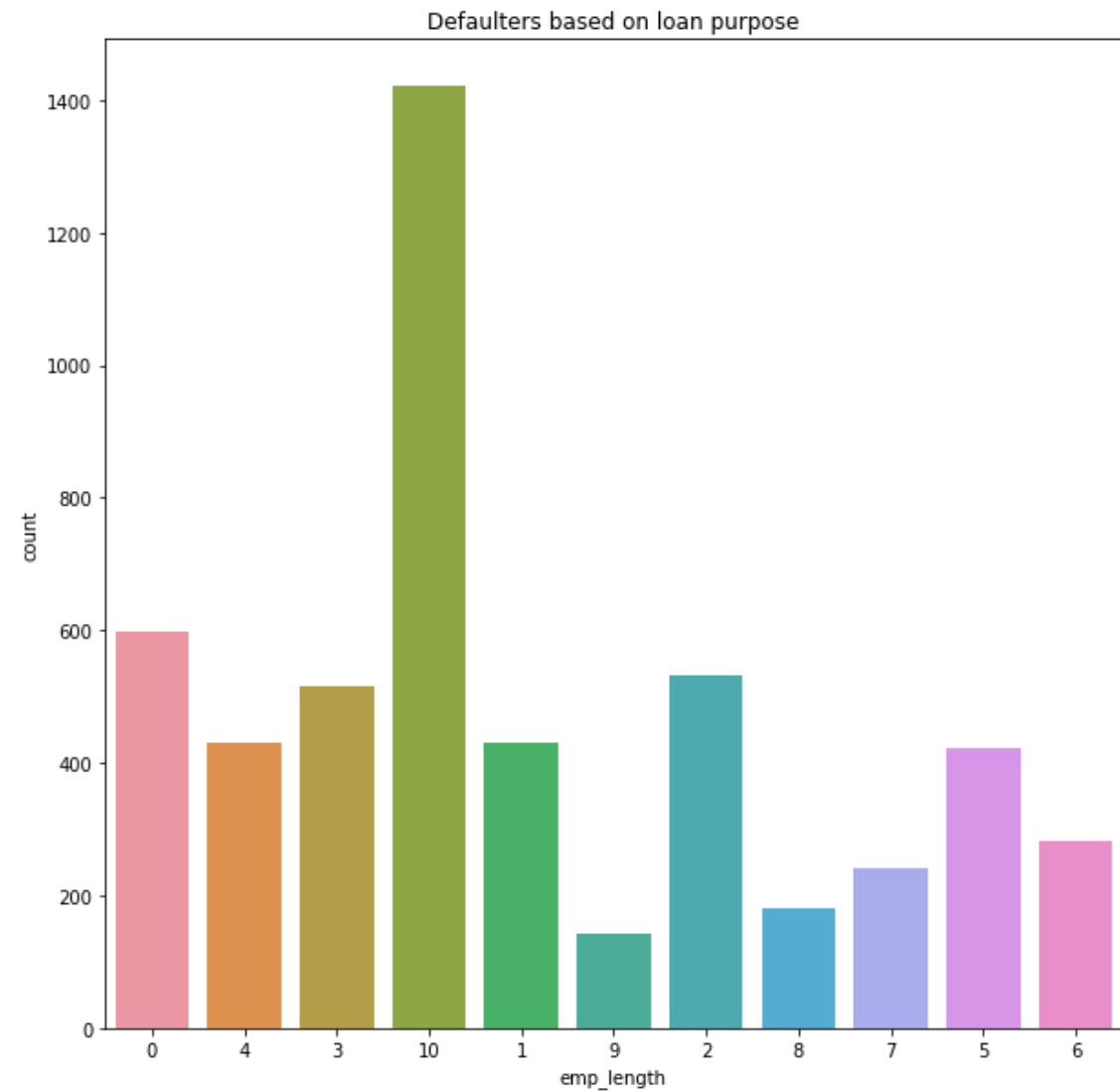
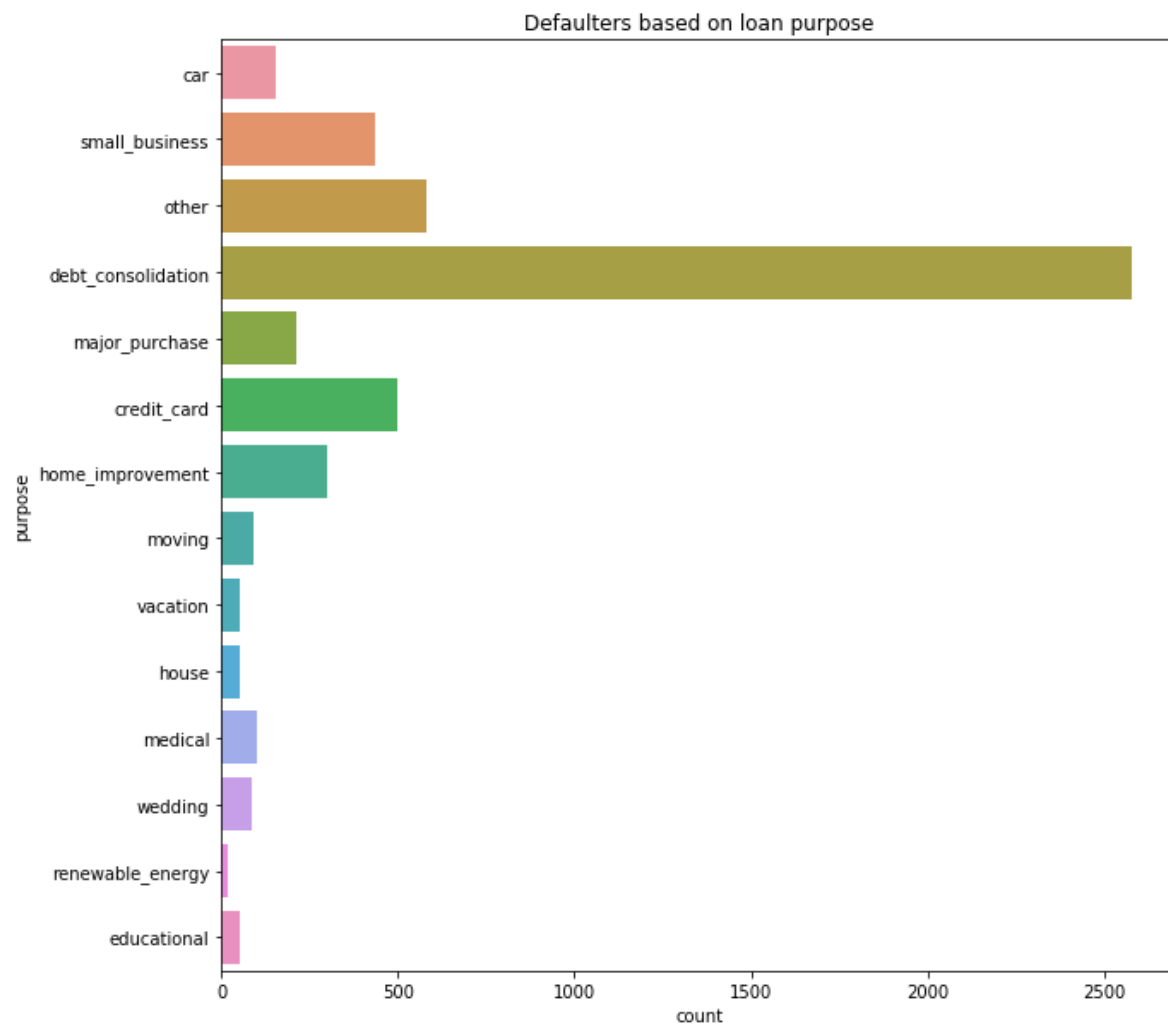
Defaulters based on annual income category

**Observations :-**

- Defaulters are more who opt for 36 months term.
- Applicants with verification status not verified
- Applicants whose interest rate in the range 9%-12%
- Applicants whose annual income is in the range 39K-55K



Observations :- Defaulters are more where the loan is issued on the month of Dec and every year there is a spike of 50%

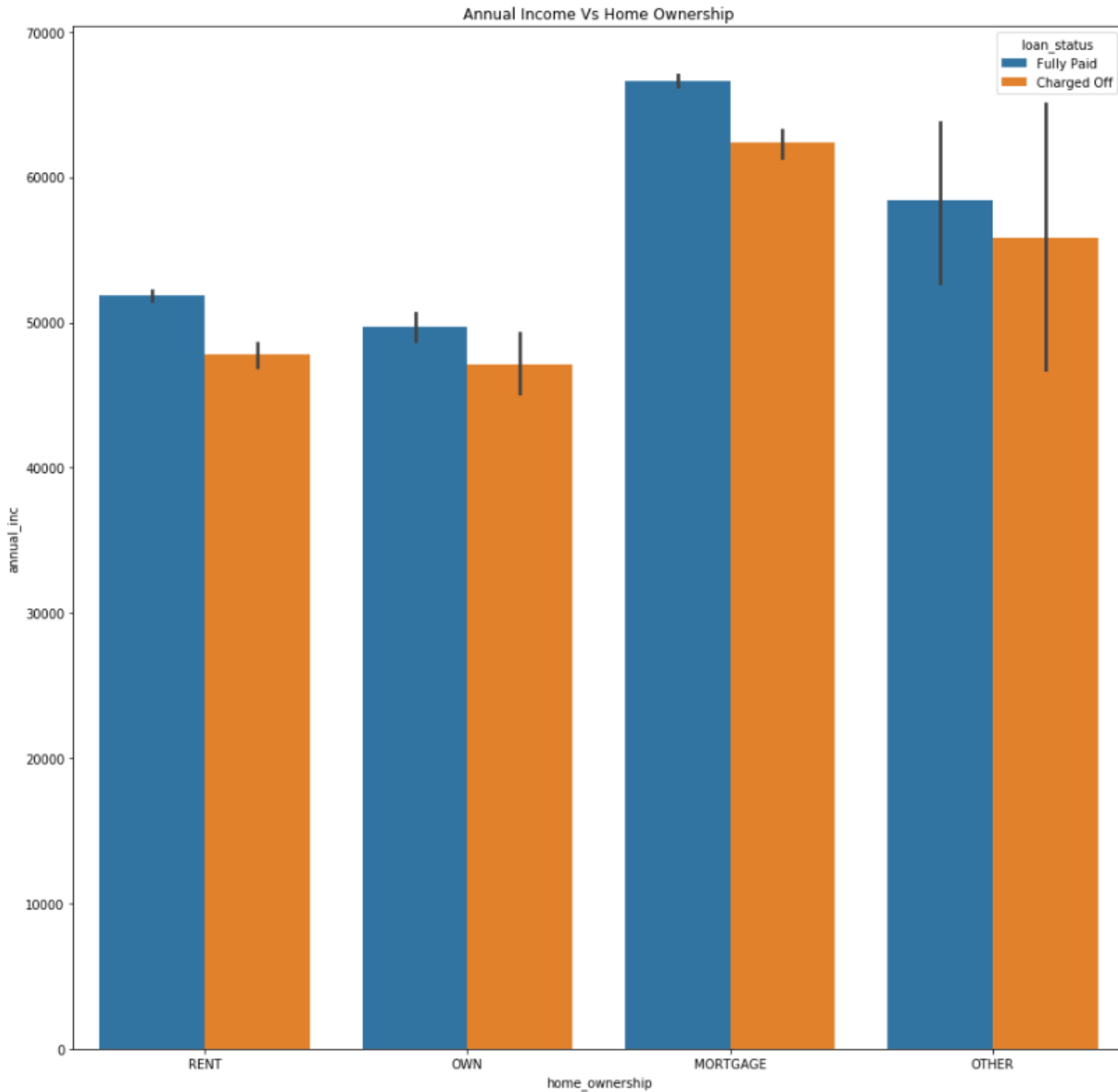


Observations :-

- Applicants with purpose 'Debt_consolidation' and applicants with employment length of 10 years

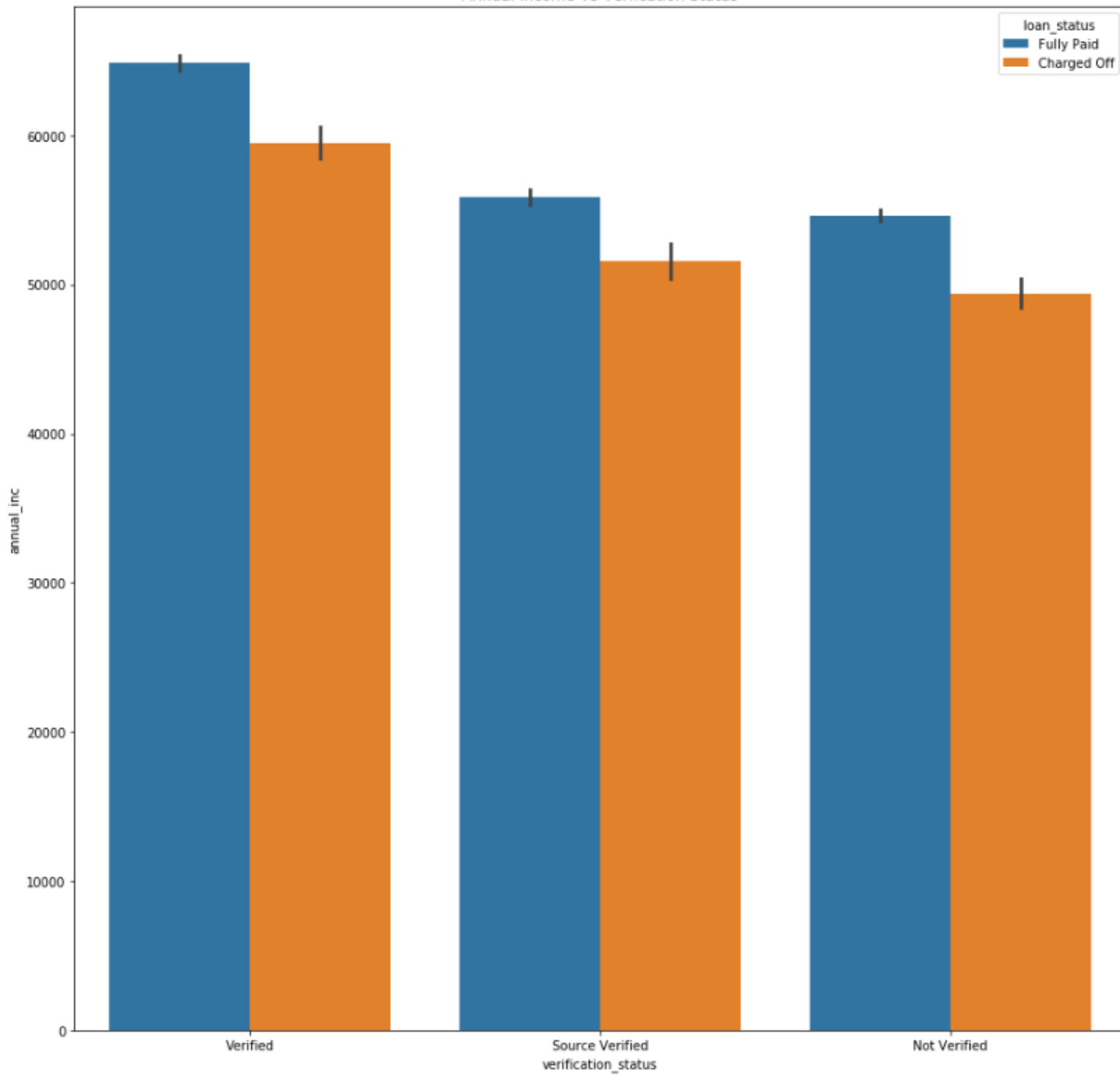
Observation [Points to Investor]

- Applicants annual income range of 55k-65k and home ownership is MORTAGE
- Applicants whose verification status is verified and annual income is above 55k
- Applicants whose verification status is verified and funded amount from investor is above 14k
- Applicants whose home ownership is MORTAGE and OTHER with requested loan amount above 12k
- Applicants whose home ownership is MORTAGE and funded amount from investor is in the range of 10k-12k
- Applicants with grade 'G' and interest rate is above 20%
- Applicants with 10 years employment and request loan amount above 12k

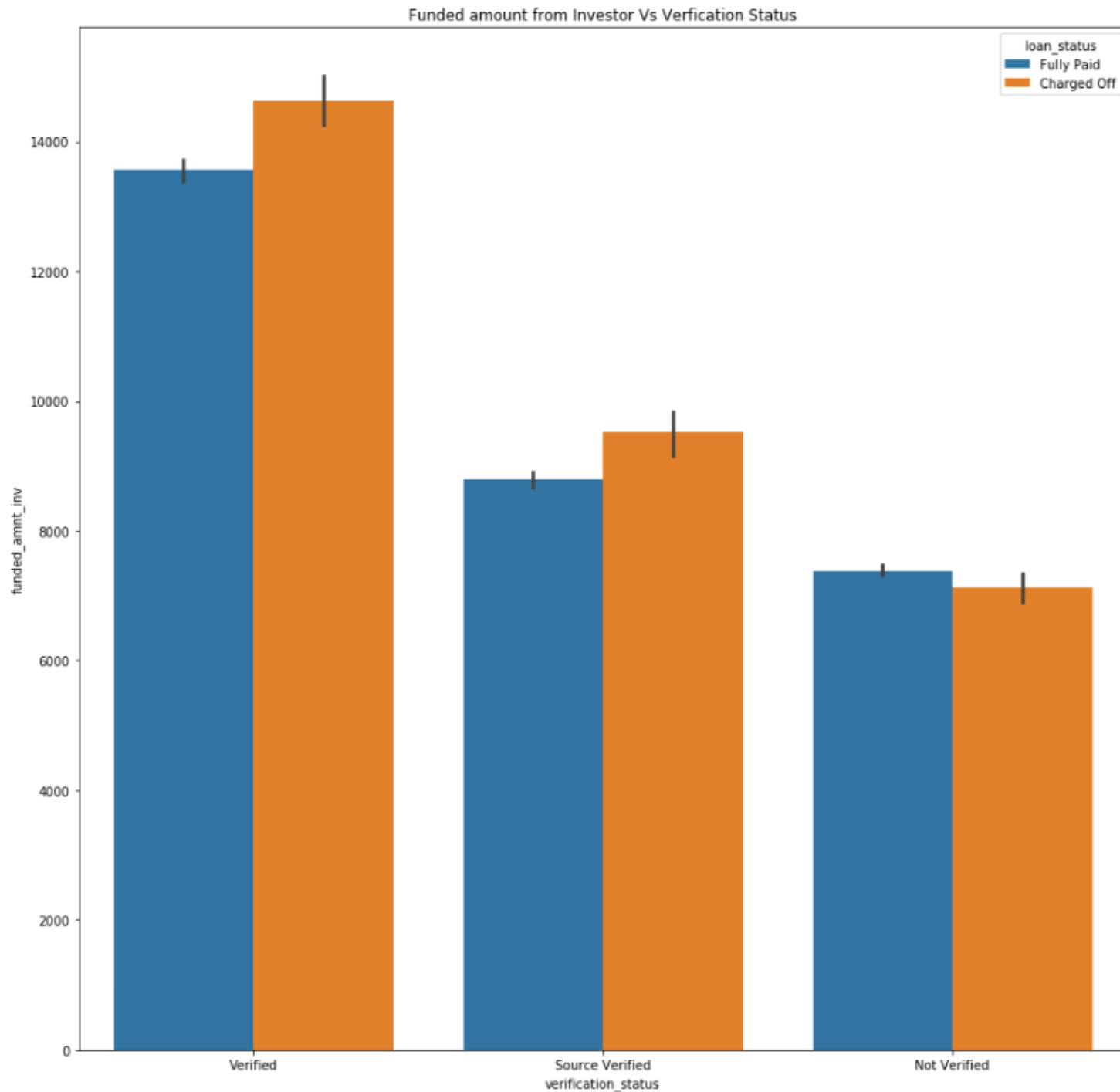


Observations :- Applicants annual income range of 55k-65k and home ownership is MORTGAGE are defaulters

Annual Income Vs Verification Status

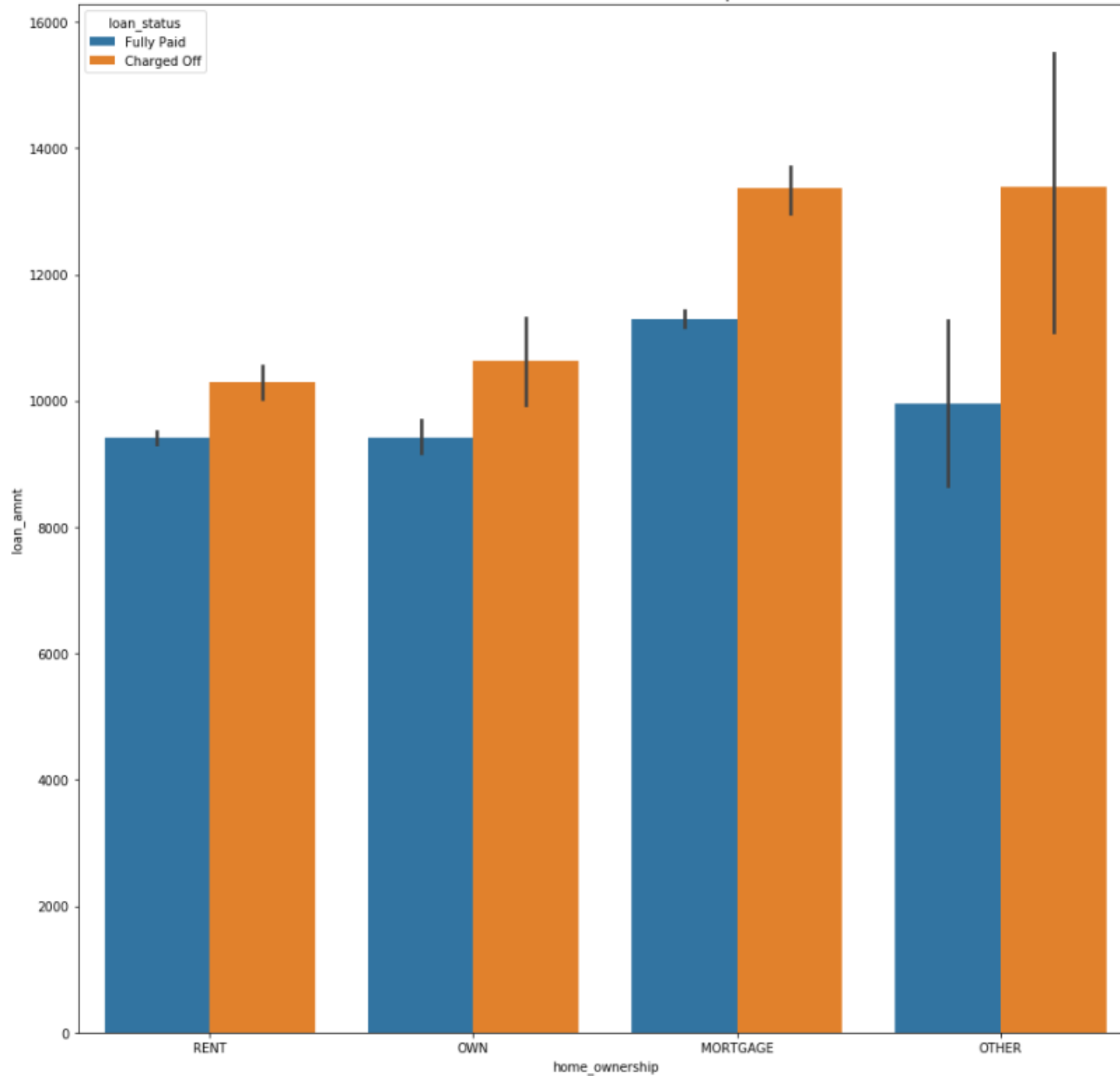


Observations :- Applicants whose verification status is verified and annual income is above 55k are defaulters

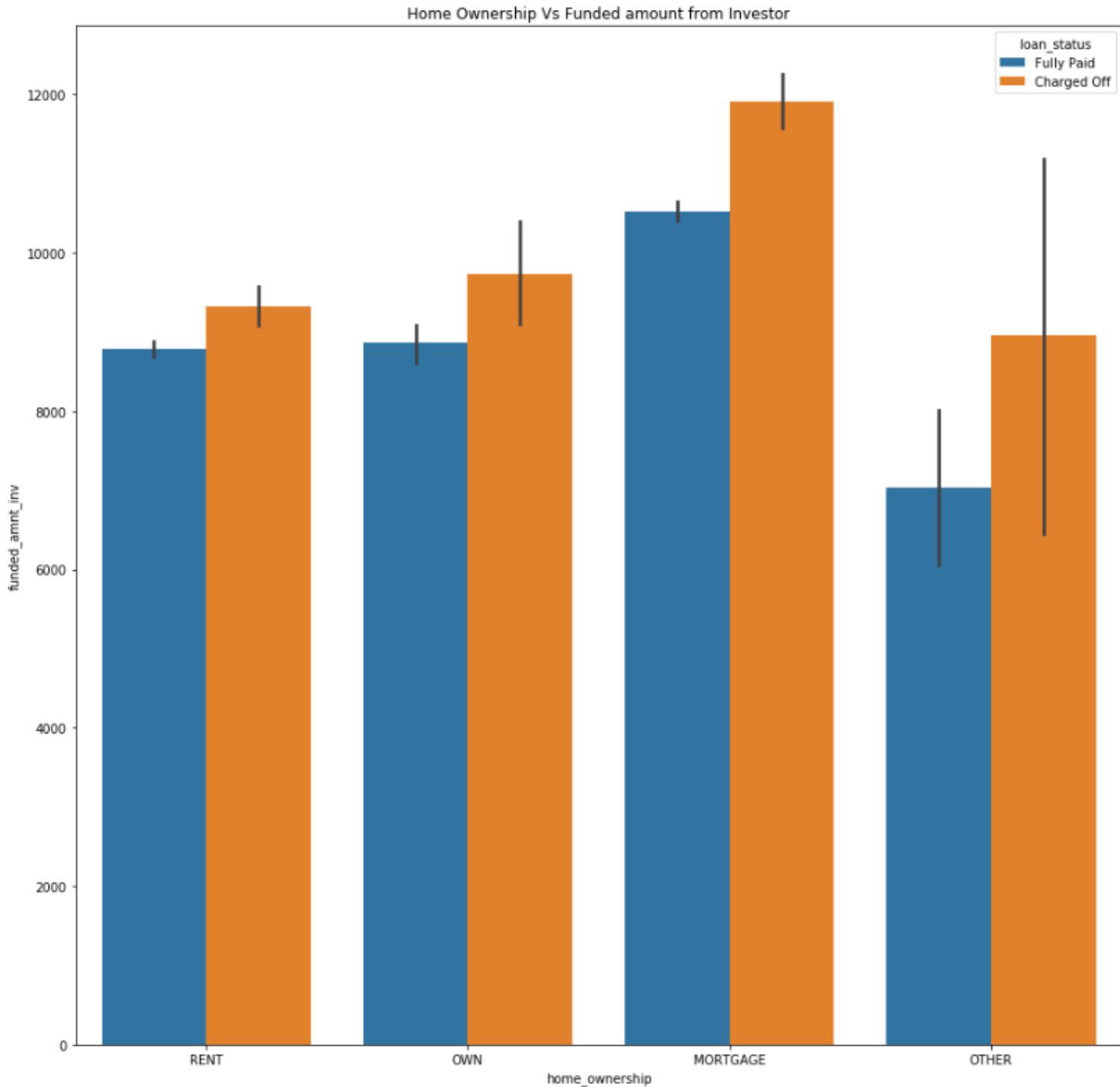


Observations :- Applicants whose verification status is verified and funded amount from investor is above 14k are defaulters

Loan Amount Vs Home Ownership

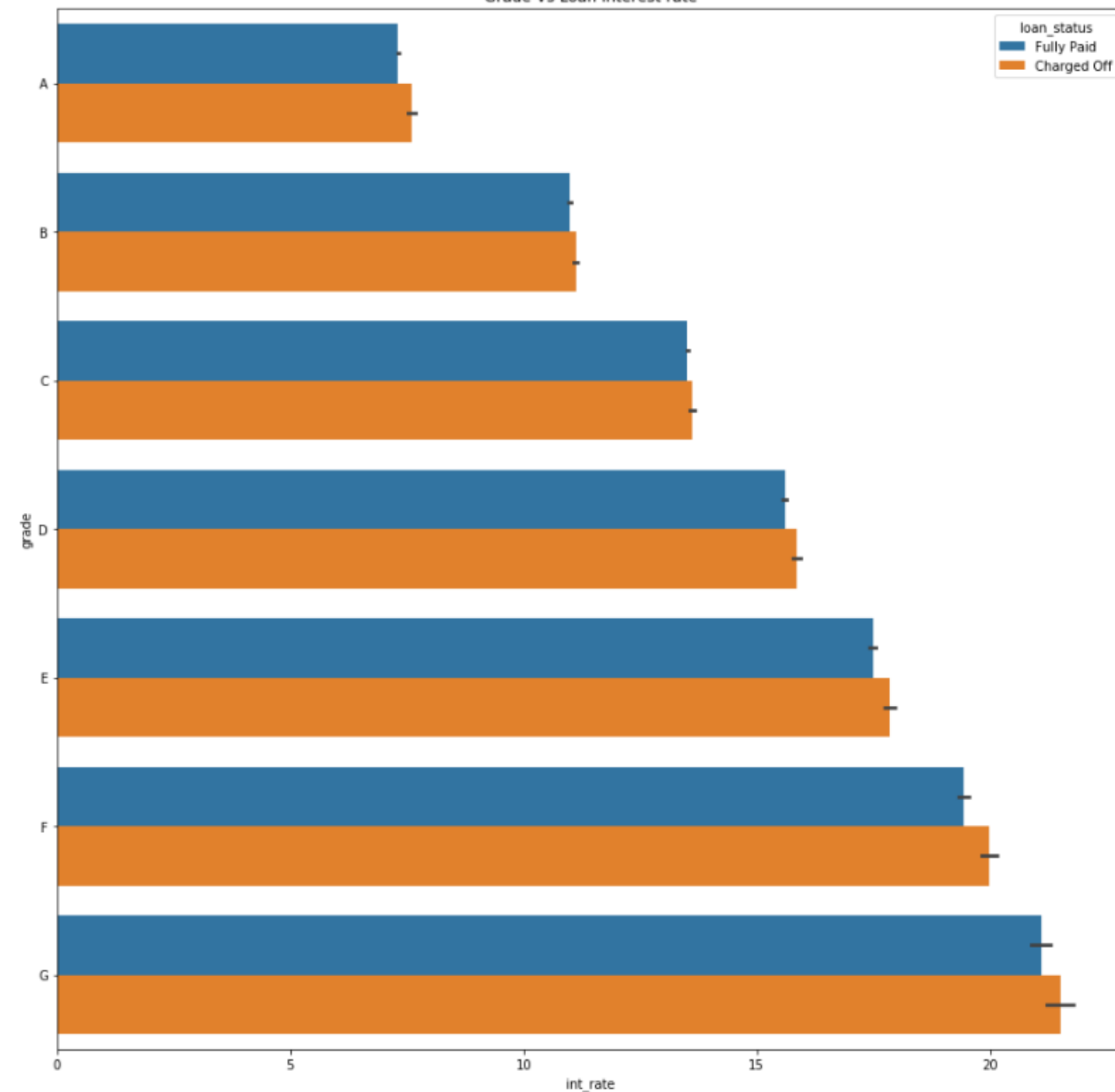


Observations :- Applicants whose home ownership is MORTGAGE and OTHER with requested loan amount above 12k



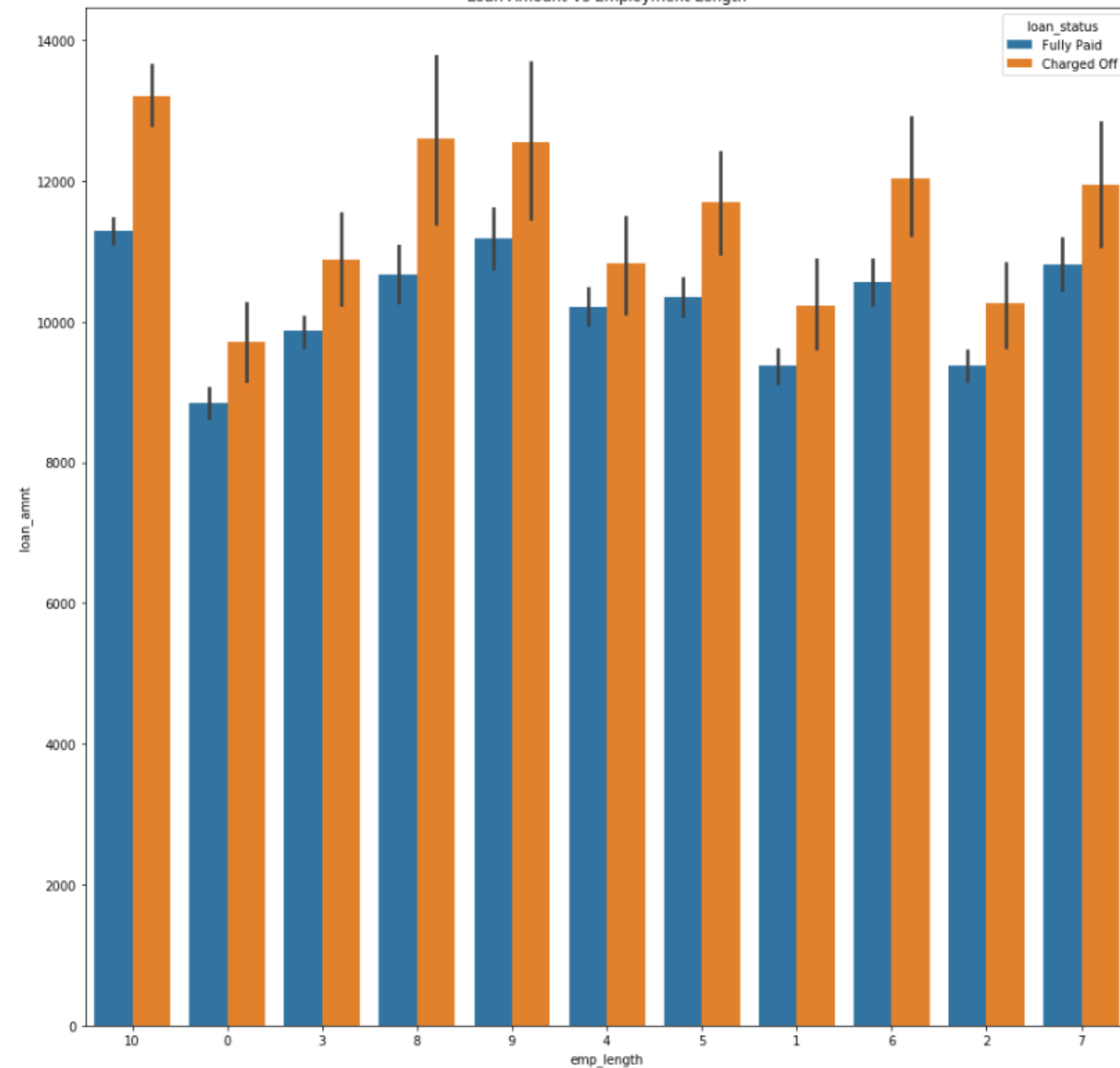
Observations :- Applicants whose home ownership is MORTGAGE and funded amount from investor is in the range of 10k-12k

Grade Vs Loan interest rate



Observations :- Applicants with grade 'G' and interest rate is above 20%

Loan Amount Vs Employment Length



Observations :- Applicants with 10 years employment and request loan amount above 12k