Gramener Case Study

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There is 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:

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

2. 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
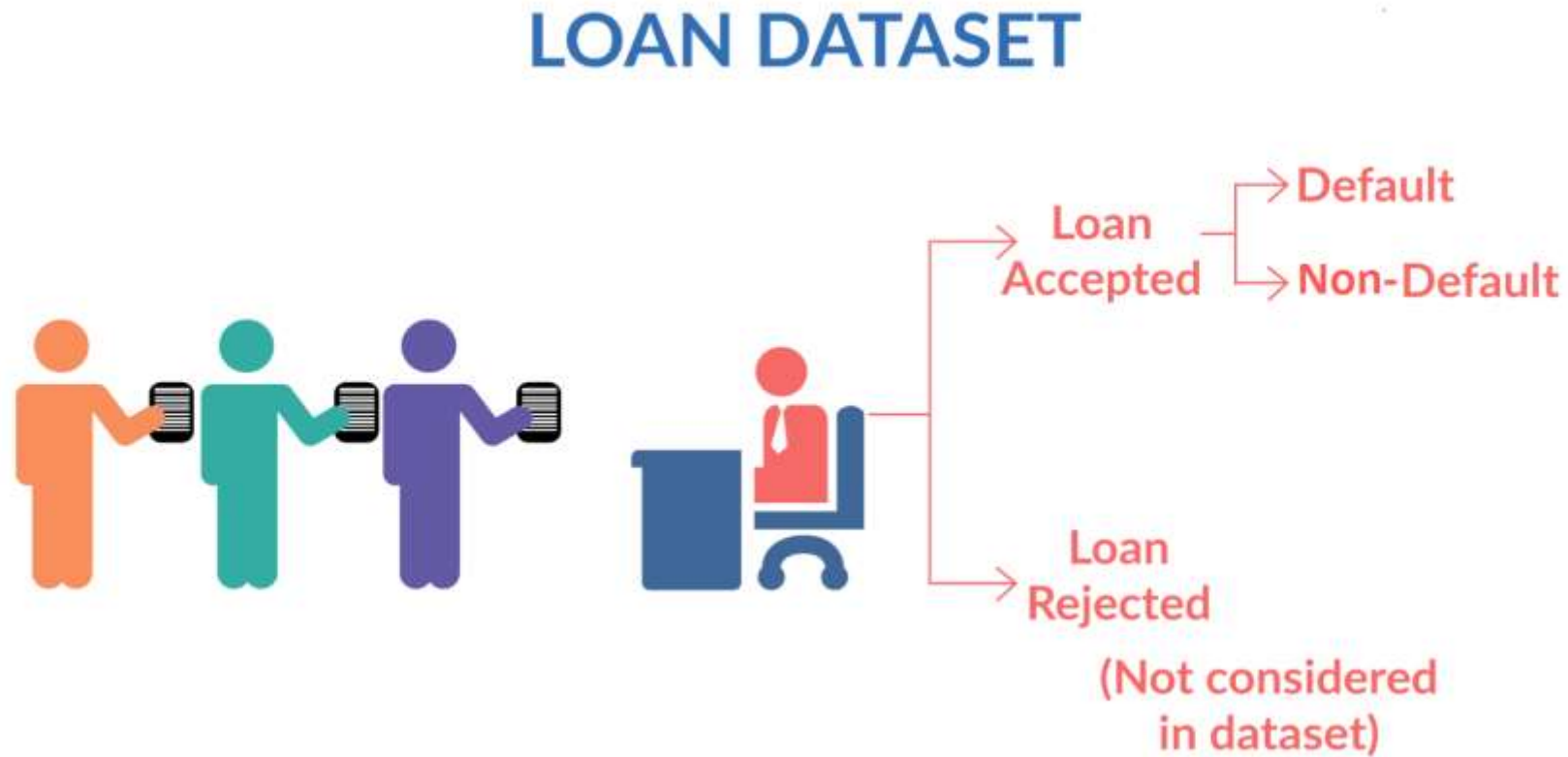
Problem Statement

- To understand how **consumer attributes** and **loan attributes** influence the tendency of default.

Problem Summary

- When a person applies for a loan, there are **two types of decisions** that could be taken by the company:

- **Loan accepted:** If the company approves the loan, there are 3 possible scenarios described below:

  - **Fully paid**: Applicant has fully paid the loan (the principal and the interest rate)

  - **Current**: Applicant is in the process of paying the instalments, i.e. the tenure of the loan is not yet completed. These candidates are not labelled as 'defaulted'.

  - **Charged-off**: Applicant has not paid the instalments in due time for a long period of time, i.e. he/she has **defaulted** on the loan

- **Loan rejected**: The company had rejected the loan (because the candidate does not meet their requirements etc.). Since the loan was rejected, there is no transactional history of those applicants with the company and so this data is not available with the company (and thus in this dataset)

Process Flowchart

LOAN DATASET

Loan Accepted → Default
Loan Accepted → Non-Default
Loan Rejected (Not considered in dataset)

Data understanding

- ## Customer's Demographics

  (Employment length, Employment title, Annual income, Zip code, Description)
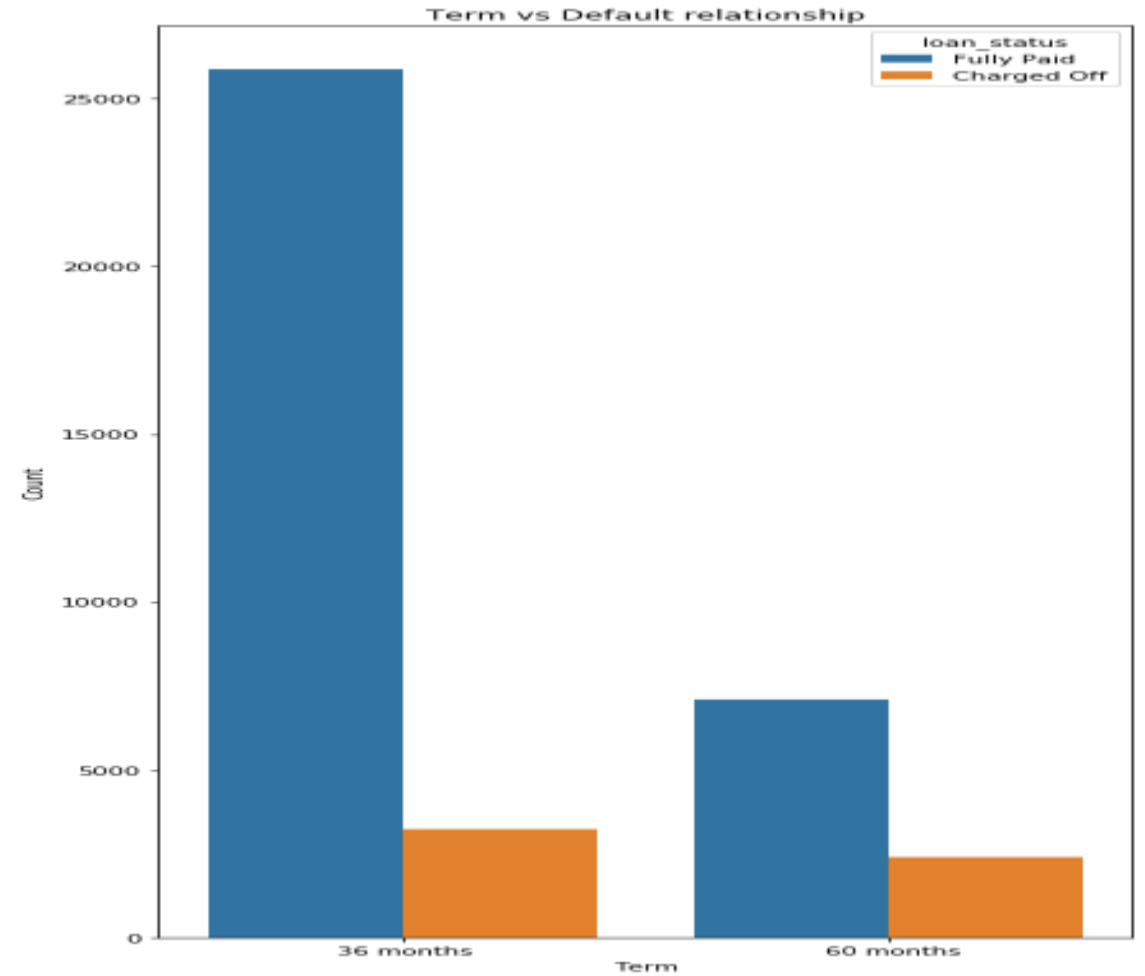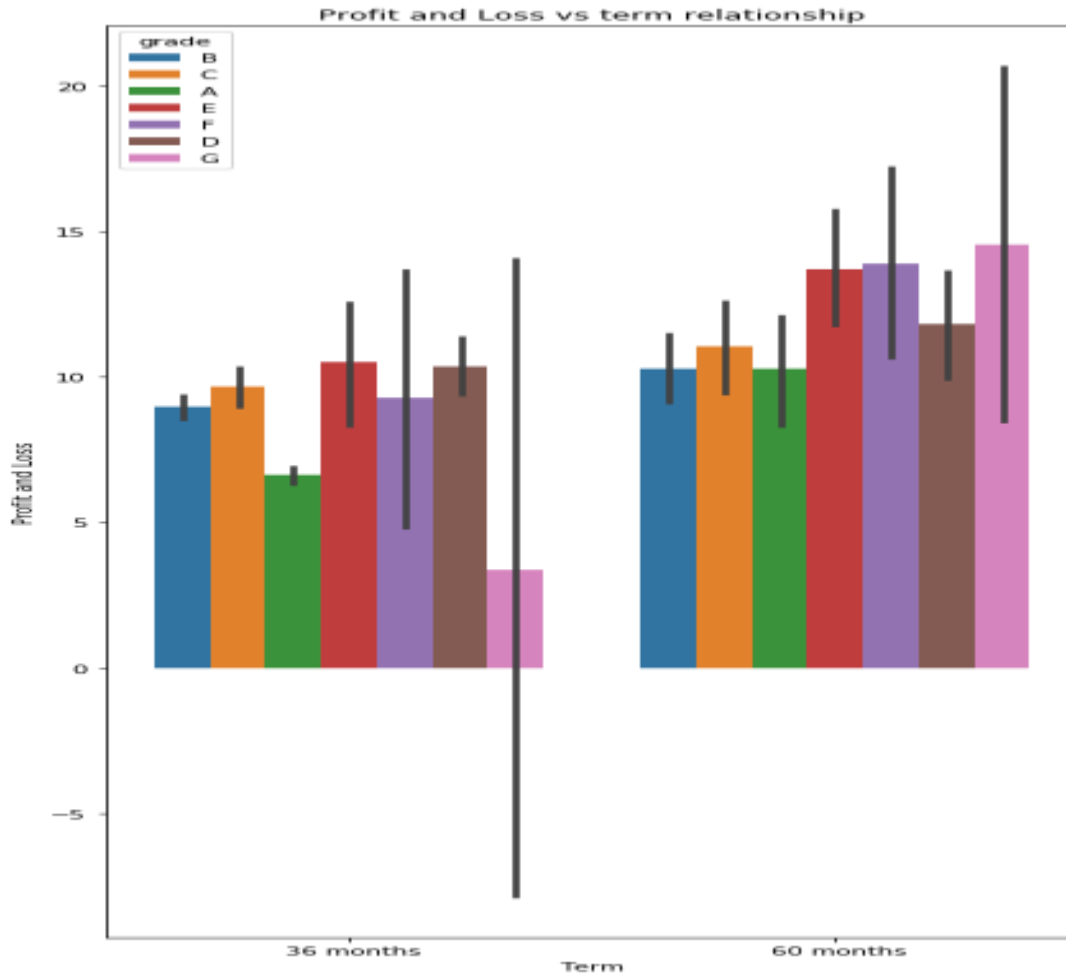
- ## Loan related information and characteristics

  (Loan amount, Funded amount, Funded amount investment, Interest rate, Loan status,

   Loan   Grade)

- ## Customer behaviour(If loan is granted)

  (Delinquency year, Earliest credit line ,Revolving balance, Recoveries, Application type,

   Loan purpose)

Profit and Loss vs Term relationship

Plots for Analyzing the Profit & Loss, Deafaults based upon loan term
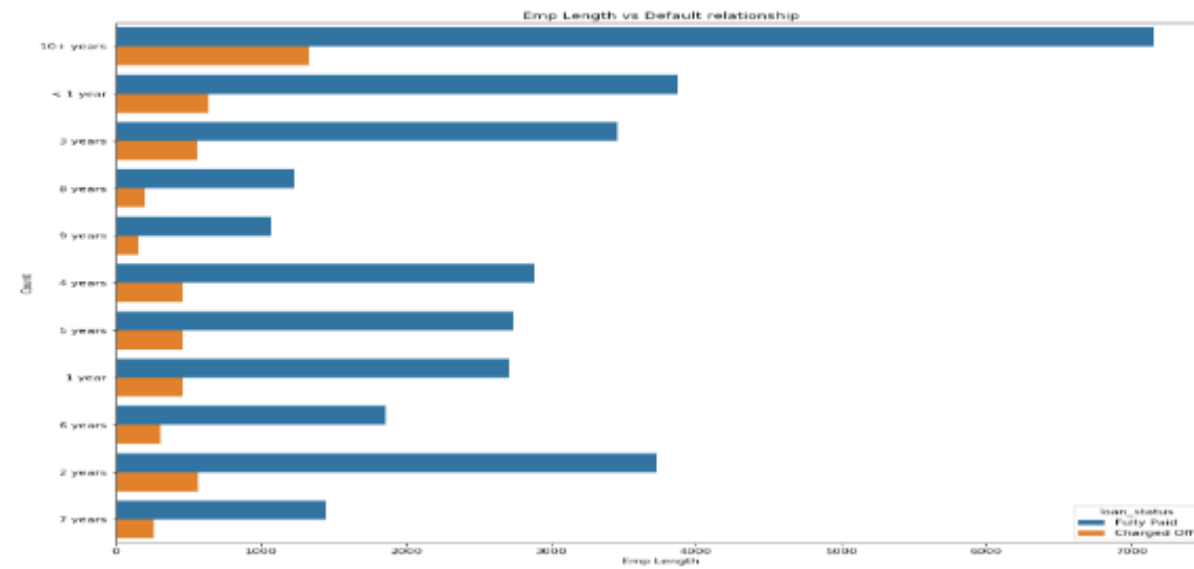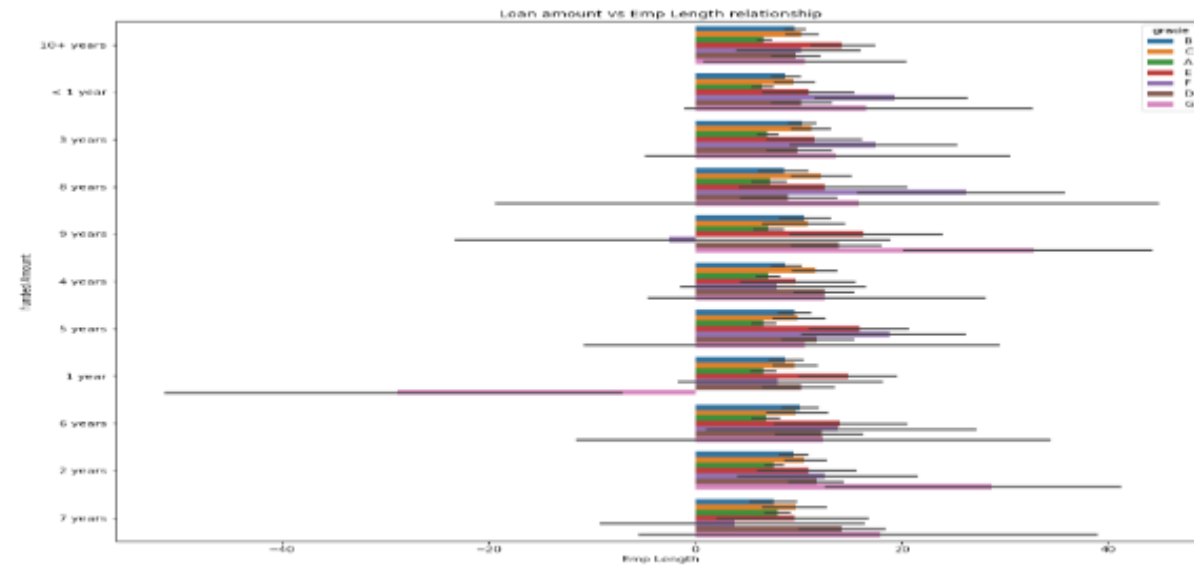
Findings

➢ Profit and Loss vs Term Relationship: It is gathered from the analysis on profit & loss vis a vis term of loan, that, term of 60 months has realized more profit than 36 months tenure.

➢ Term vs Default Relationship: Customers availing loan for shorter term, i.e. 36 months tenure has better payment record compare to the customers who take loan for a longer period.

Loan amount vs Employee employment duration relationship
&
# Employment Duration vs Default relationship

Findings

- ➢ Loan amount vs Employee employment duration relationship :- Employee with employment duration of 10+ years has most payment record for fully paid status when compared with other durations.
- ➢ Employment Duration vs Default relationship:- Employee with employment duration of 10+ years has maximum no of charged off status.

Plots for Analyzing the Loan amount ,Employment duration relationship
& Default relationship

Analysis on Funded amount vs Home Ownership relationship & Home Ownership vs Default relationship :
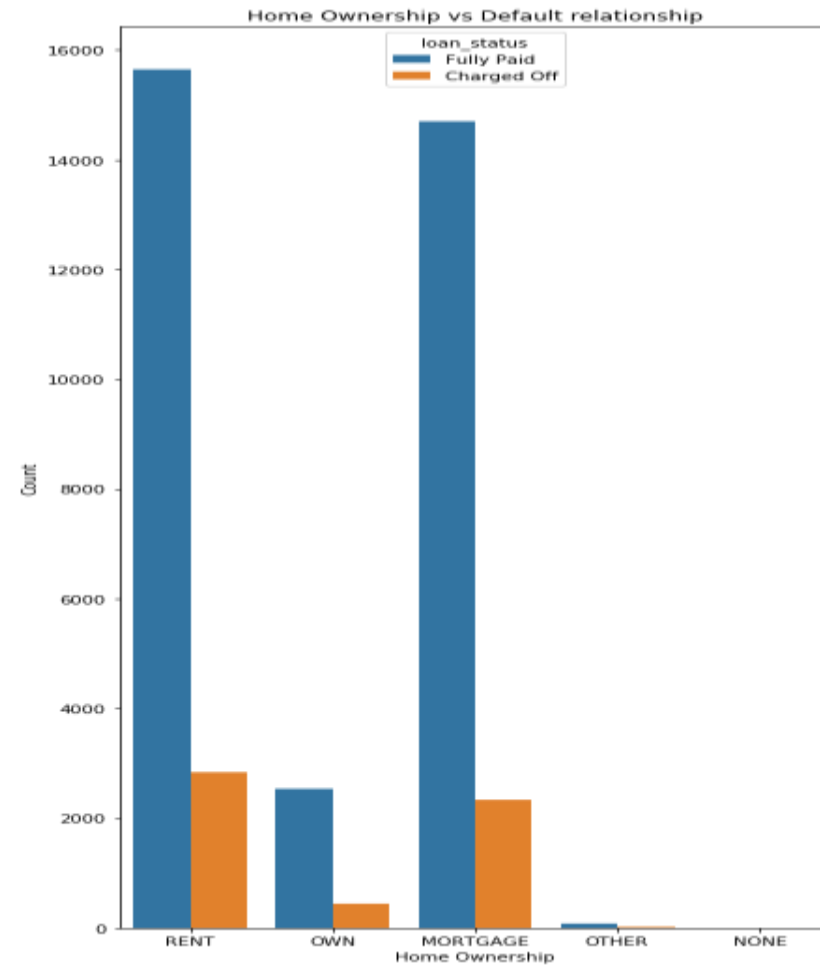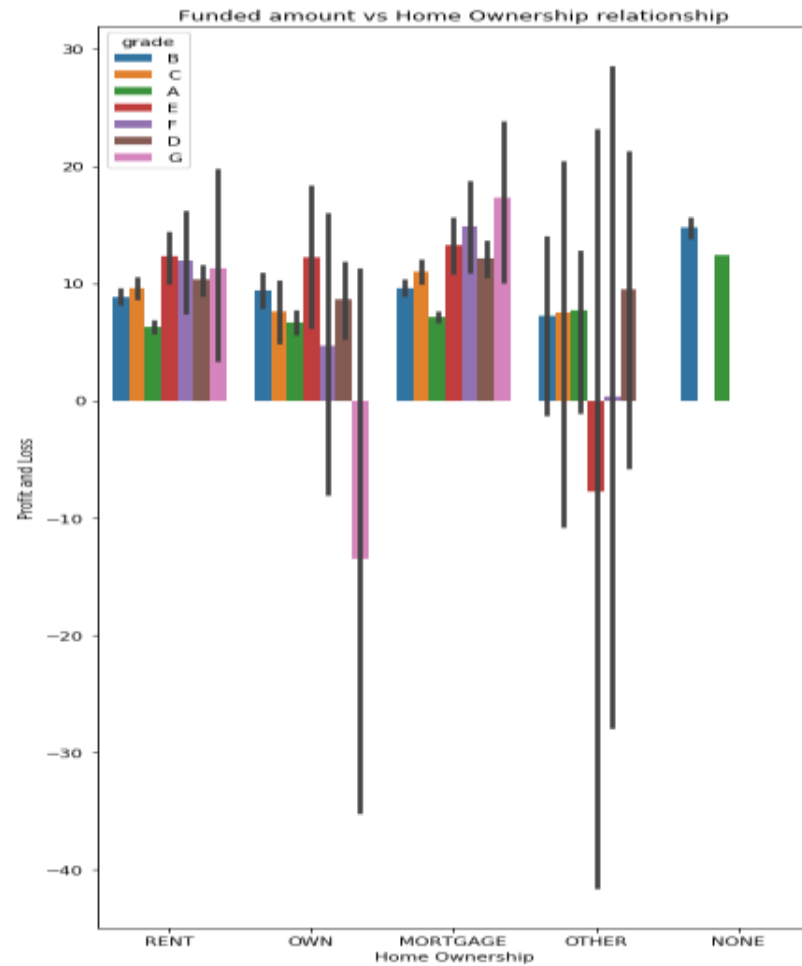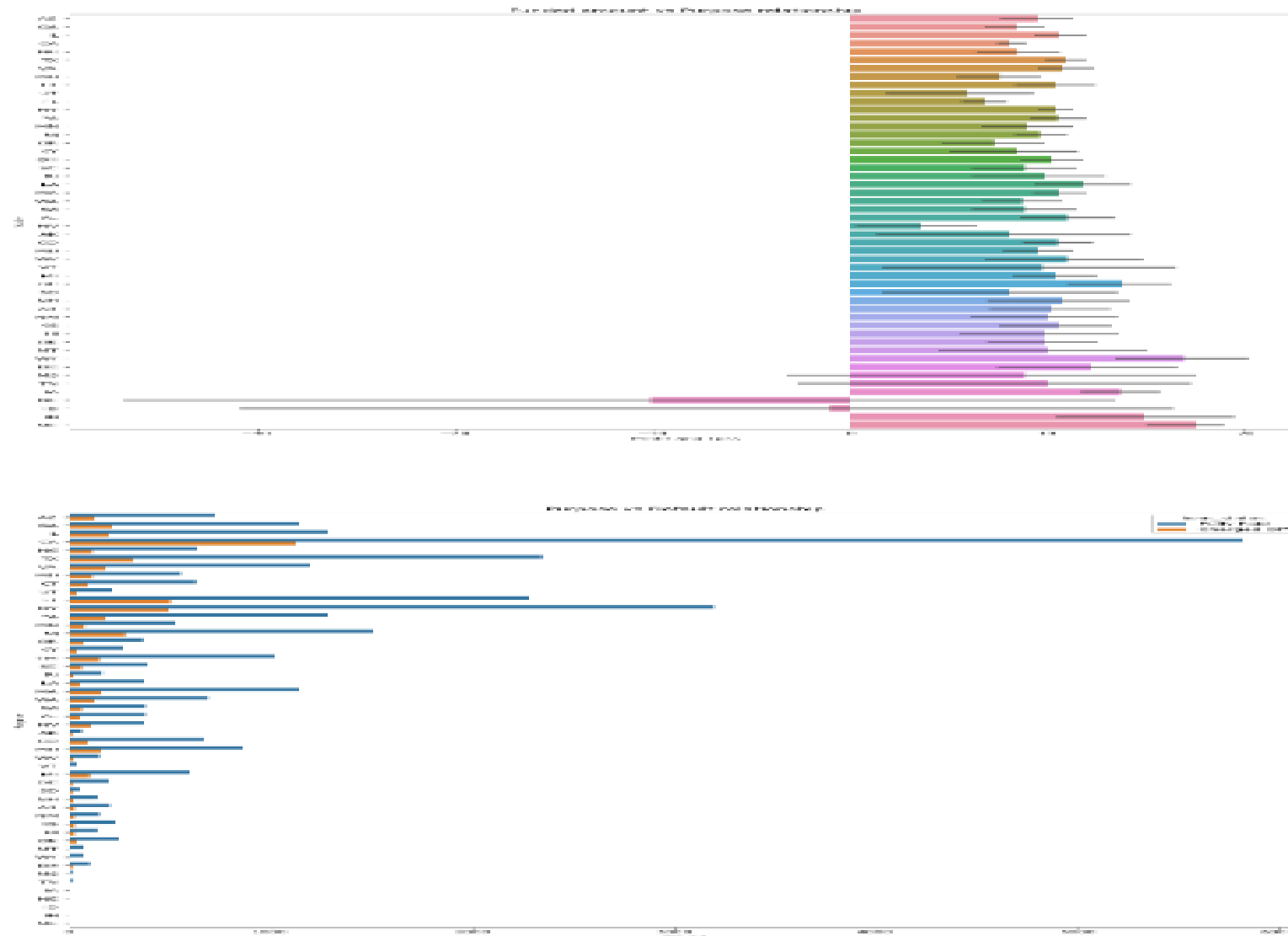
Findings

- Funded amount vs Home Ownership relationship Other category contains maximum and minimum values for profit and loss, home ownership lies in between the other categories.

- Home Ownership vs Default relationship : Ownership status rent has maximum number of cases in as fully paid status and that for charged off status.

Analysis on Funded amount vs Purpose relationship
# &
Purpose vs Default relationship

Findings

- State WY has maximum value for fully paid status in Funded amount vs Purpose relationship plot (between 10 to 20)

- State NE has negative value (-10) in Funded amount vs Purpose relationship plot

- State CA has maximum value for fully paid status in Purpose vs Default relationship (between 5000 to 6000)

**Plots for Analyzing the Funded amount ,Purpose
& Default relationship**

Univariate analysis :
# Employment length vs Loan Status
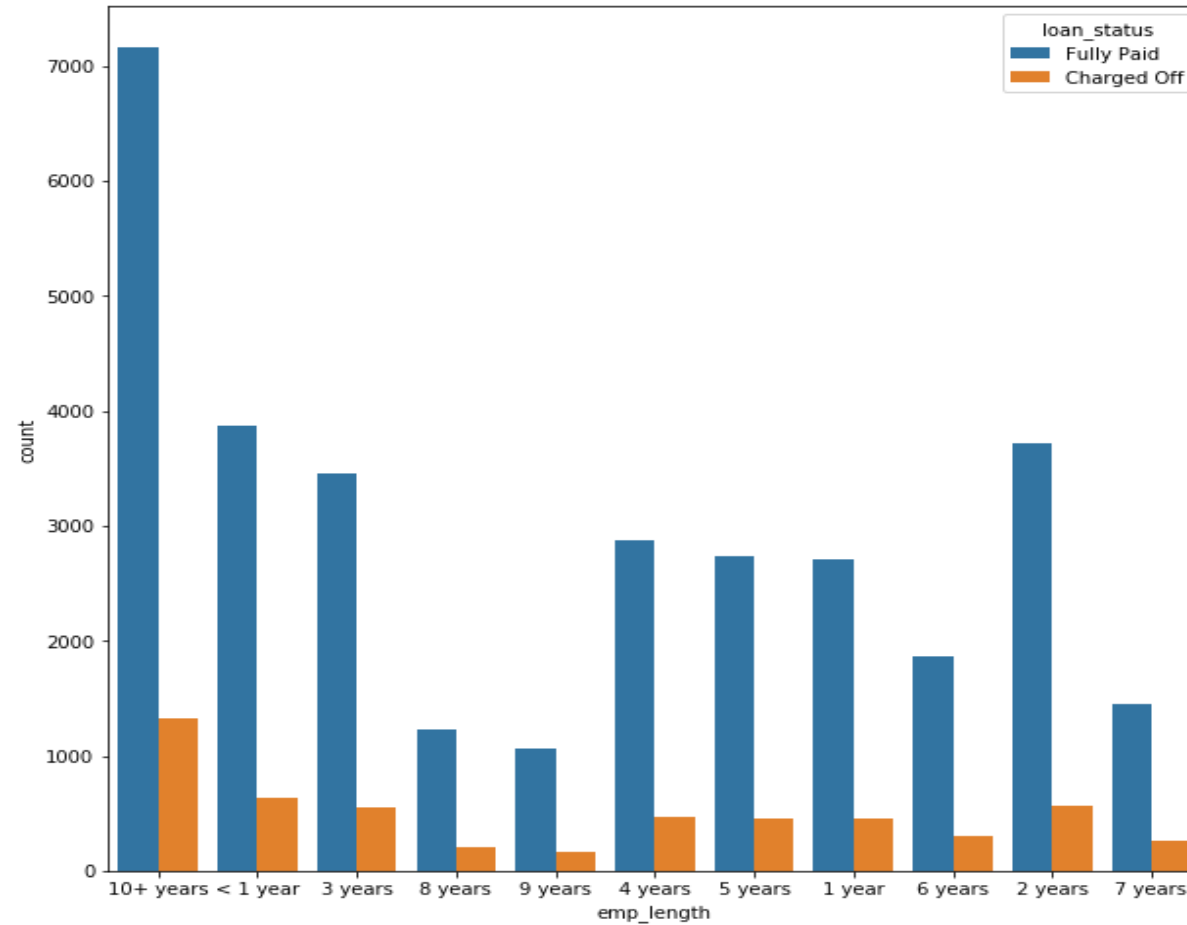
Plot for Univariate Analysis

Findings

➢ Employee with employment duration of 10+ years has most payment record for fully paid status when compared with other durations.

➢ Employee with employment duration of 10+ years has maximum no of charged off status.

Multivariate analysis:
Analyzing public records, Debt to Income ratio, inquires in last months, revolving utilization, revolving utilization
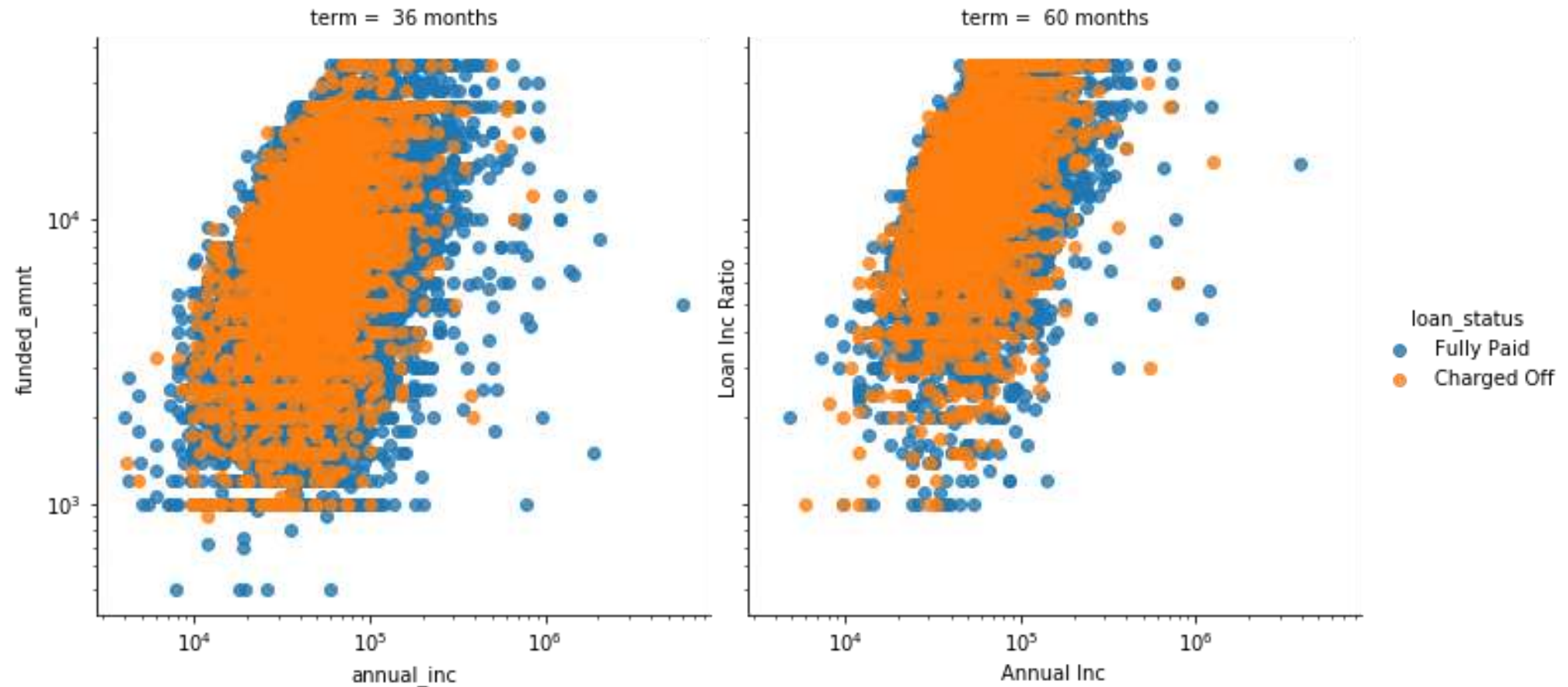
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Conclusions

- Organization should increase the loan term from 36 months & at-most 60 months for increasing the profitability, however, this would come with an residual risk of little bit increase in the default rate also, thus to address that, there should be some form of incentive & penalty for the candidates who are likely to pay & ones who are more likely to default than the latter. One way to achieve this would be offering lesser interest rate to customers who are likely to pay than the one who is more likely to default.

- Organization should perform other type of profile checks while giving the loan to customers having employment duration of 10+ years, as this will help in addressing the maximum no of charged off cases and also increase the profitability as max no of successful loan closures. Based on the profile check there should be some incentive & penalty for the customers.

- Organization should refrain from giving hefty loans to customers who are living in rented house to limit the charged off cases.

- Organization should refrain from giving hefty loans to customers seeking loan for debt consolidation. Further, if loans are given than organization should ask for some collateral and should give the loan on higher interest rates than the other purposes.