

LENDING CLUB CASE STUDY

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Objective

Lending Club, one of the largest online loan marketplace, facilitates personal loans, business loans, and financing of medical procedures. One of the major concerns of this company is lending loans to ‘risky’ applicants which is the largest source of financial loss (called credit loss).

The company wants to understand the driving factors behind loan default and identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss. The company can then utilize this knowledge for its portfolio and risk assessment.

Our aim is to understand and identify the driving factors due to which a loan gets charged off.

Problem Solving Methodology

➤ Data Understanding:

1. The loan data set contains the complete loan data for all the loans issued through the time period 2007 to 2011.
2. The information related to each variable is given in the data dictionary to help get a better understanding of the variables involved in the risk analysis for defaulter loans.

➤ Data Cleaning:

1. We have dropped all the columns with null values which will not impact our analysis.
2. We dropped the columns with only a single value throughout the column across each rows and some other columns like recoveries, recovery collection fees, etc. which will only be useful after loan approval.
3. We have dropped all the rows corresponding to 'loan_status' as Current as it is outside the scope of our analysis.

➤ Data Preparation:

1. We have performed Univariate Analysis by plotting boxplots and removing outliers.
2. Additionally, Bivariate Analysis has been done for each categorical variable against the driver variable 'loan_status' to gain insights about the charged-off loans.

Loan Status Analysis

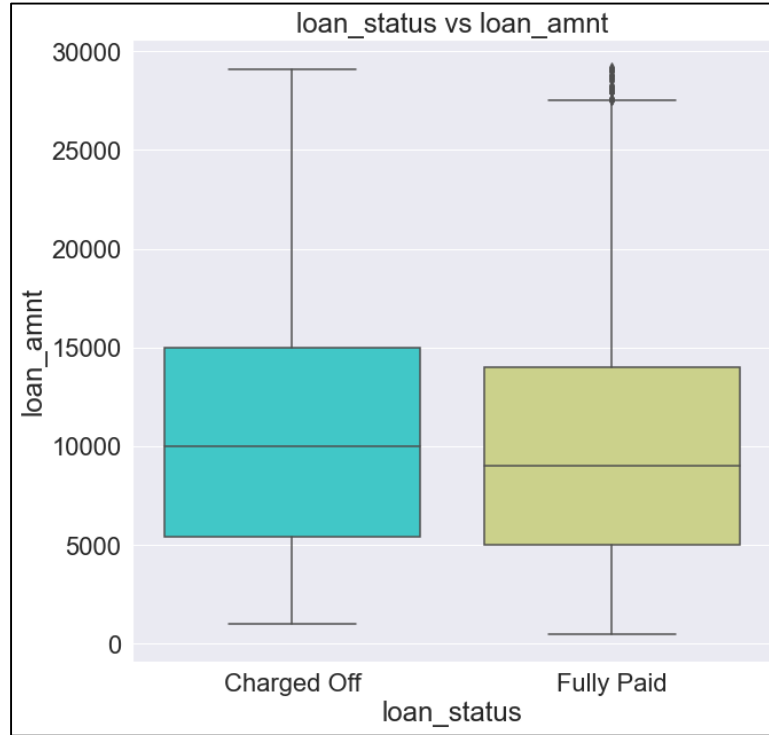


Figure 1

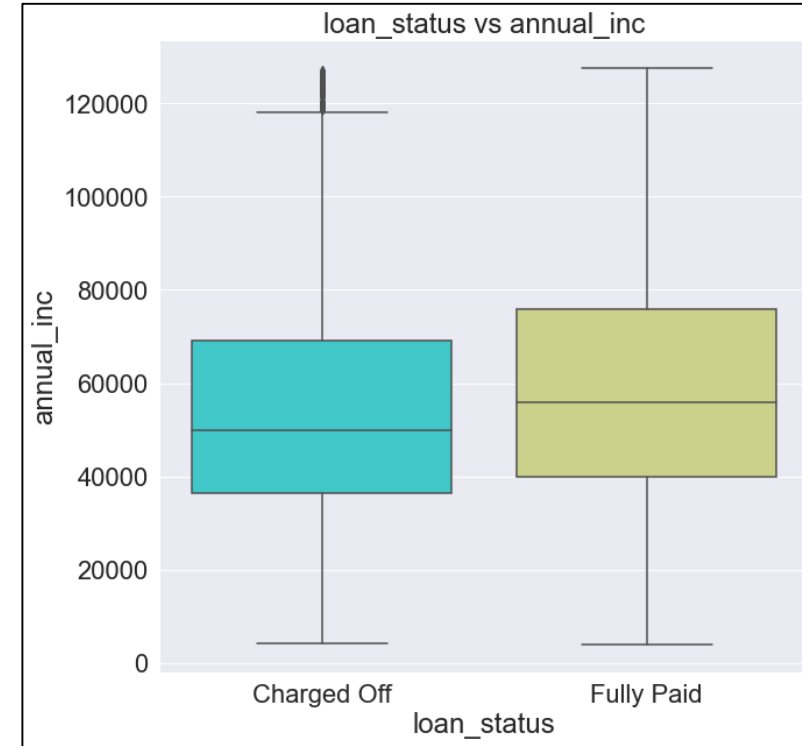


Figure 2

Observations:

1. Higher the loan amount, higher the chances of being charged off. (**Figure 1**)
2. Higher the annual income, higher the chances of loan getting fully paid due to their better repayment capacity. (**Figure 2**)

Loan Status Analysis

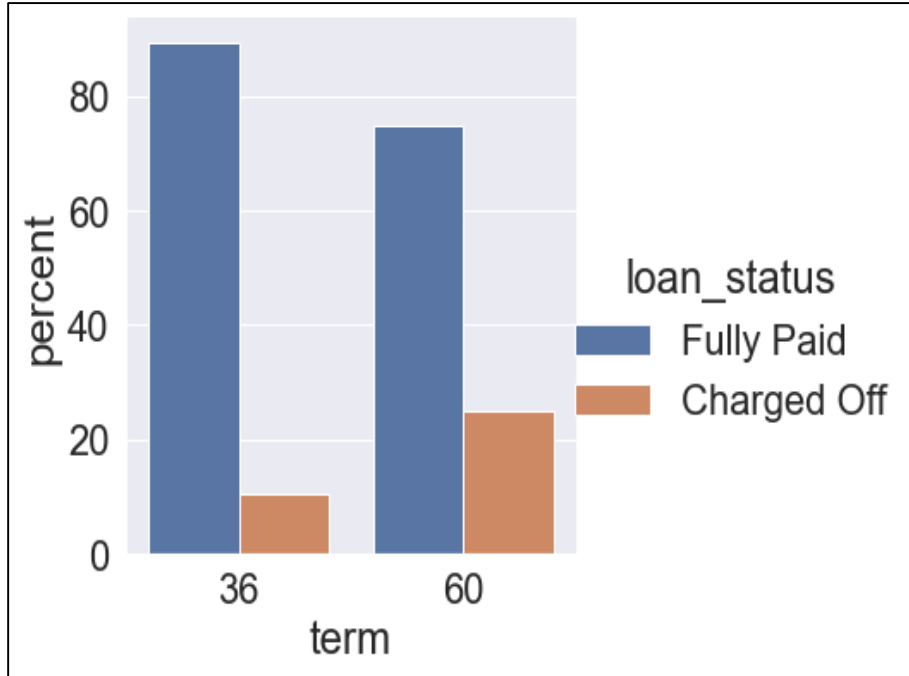


Figure 1

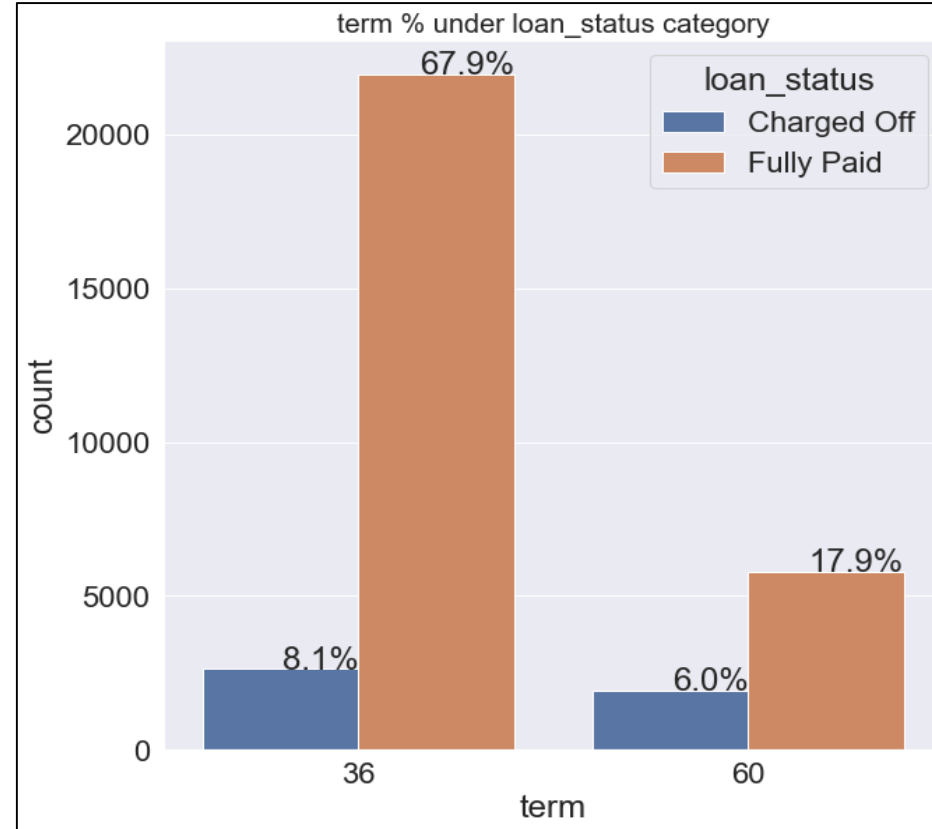
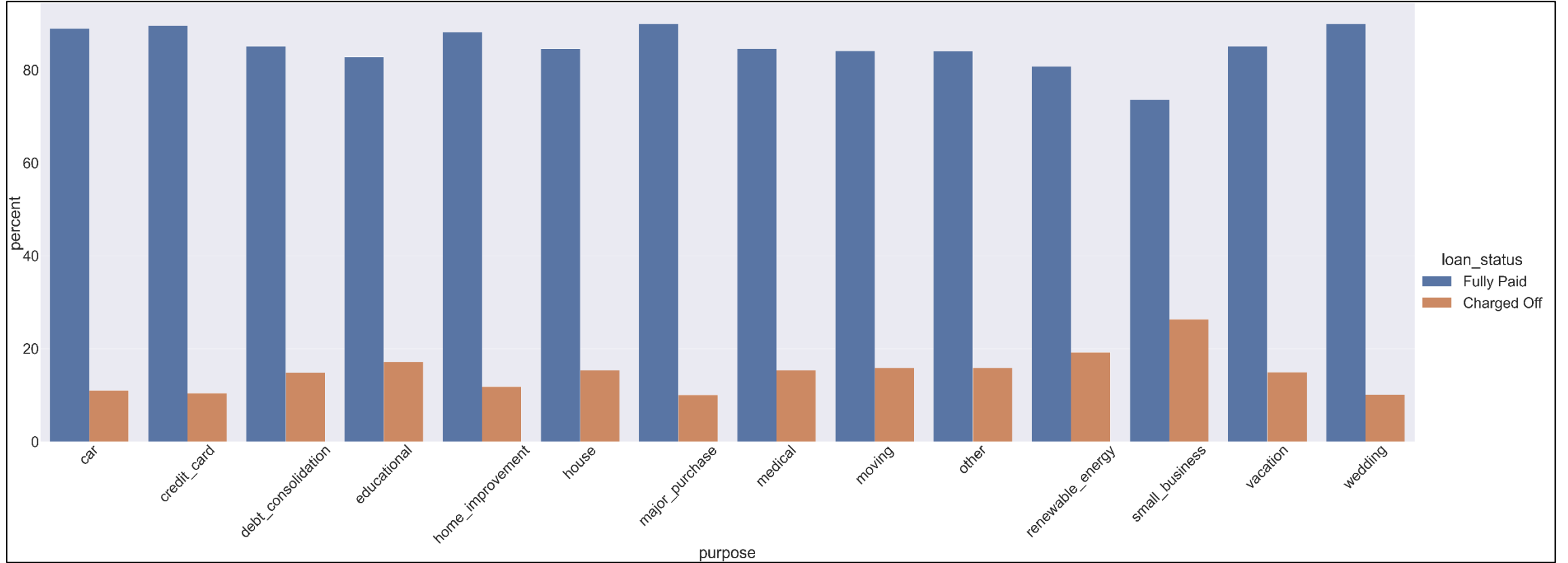


Figure 2

Observations:

1. Borrowers with 60 months of loan repayment term are more likely to get charged off. **(Figure 1)**
2. Most of the loans have been full paid(around 86%).Out of these majority of the loans were borrowed for a term of 36 months. **(Figure 2)**

Loan Status as per purpose of loan



Observations:

1. Borrowers who took loan for the purpose of 'small_business' had the highest percentage of total loans that were charged off.

Loan status as per public records and bankruptcies

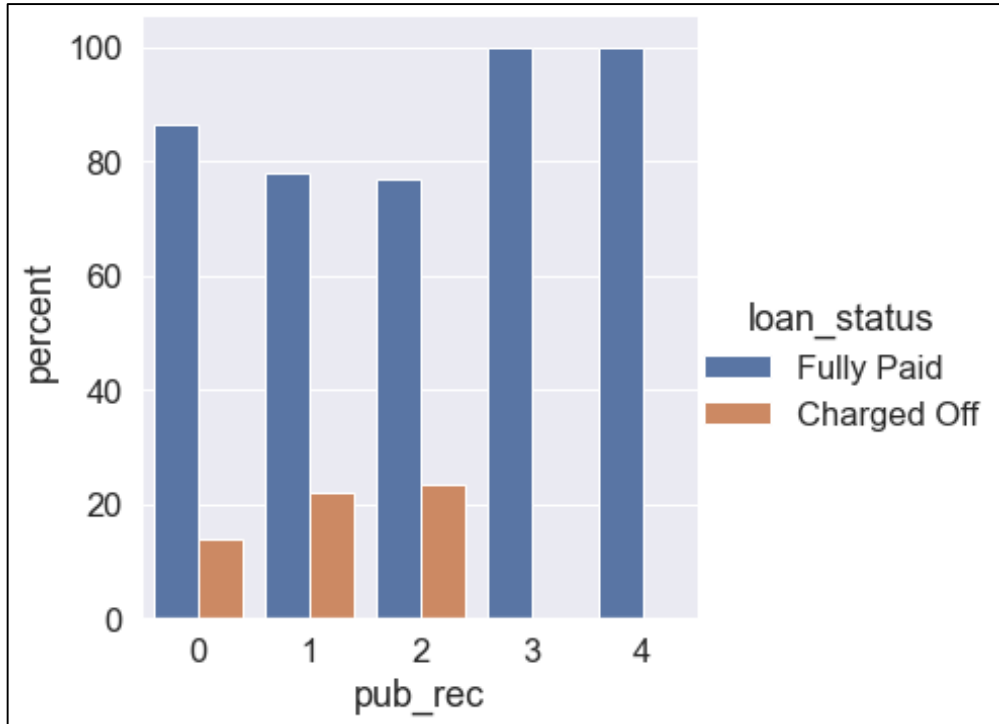


Figure 1

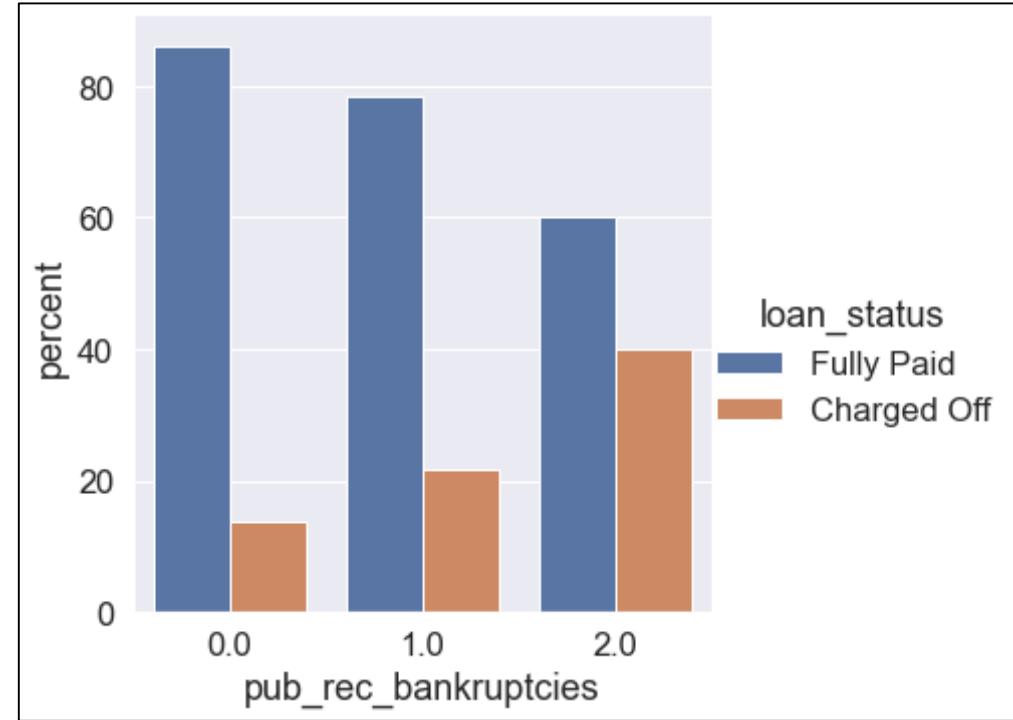


Figure 2

Observations:

1. Borrowers with higher public derogatory records were more likely to fully pay off their loans in order to improve their credit records. **(Figure 1)**
2. Borrowers with higher public bankruptcy records were more likely to get charged off. **(Figure 2)**

Loan status as per home ownership

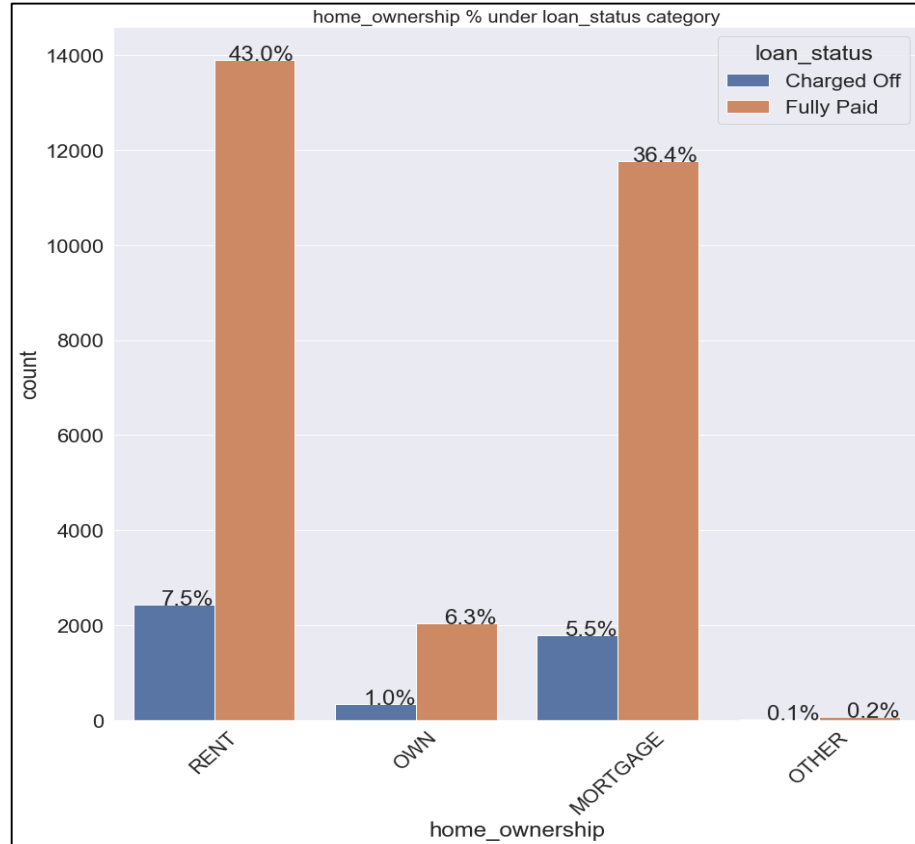


Figure 1

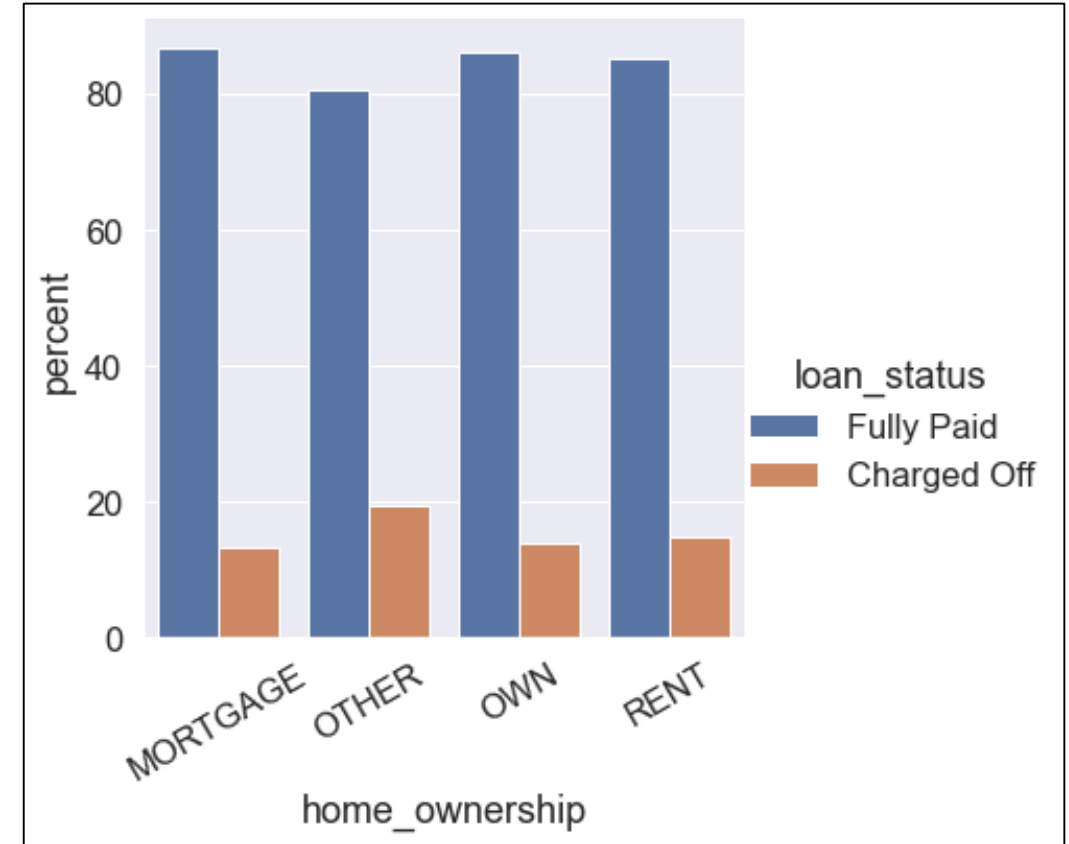
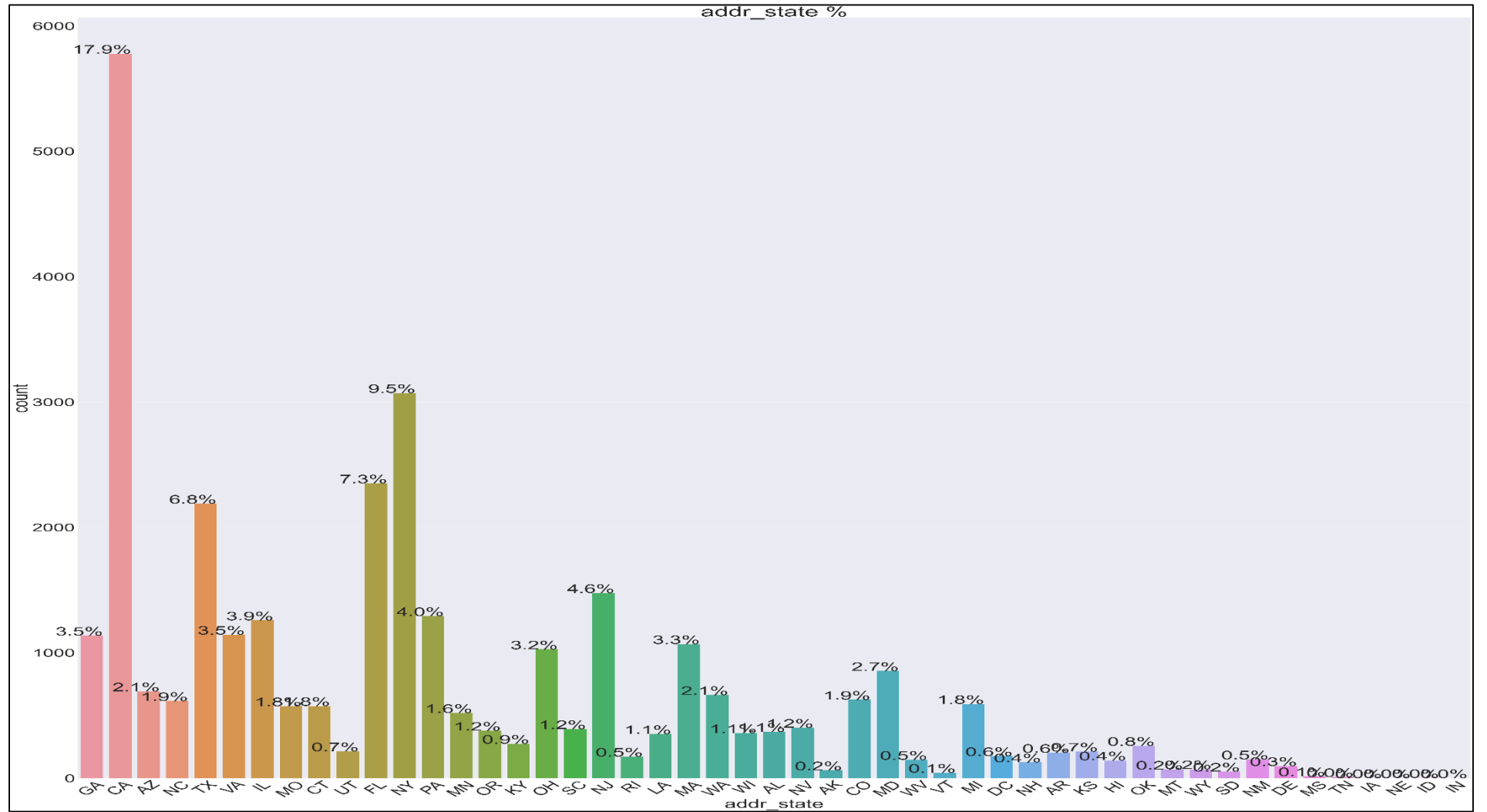


Figure 2

Observations:

1. The number of borrowers whose home ownership is under RENT category availed the maximum number of loans. **(Figure 1)**
2. Borrowers with home ownership under 'OTHER' category were more likely to get charged off. **(Figure 2)**

Loan status as per demographic



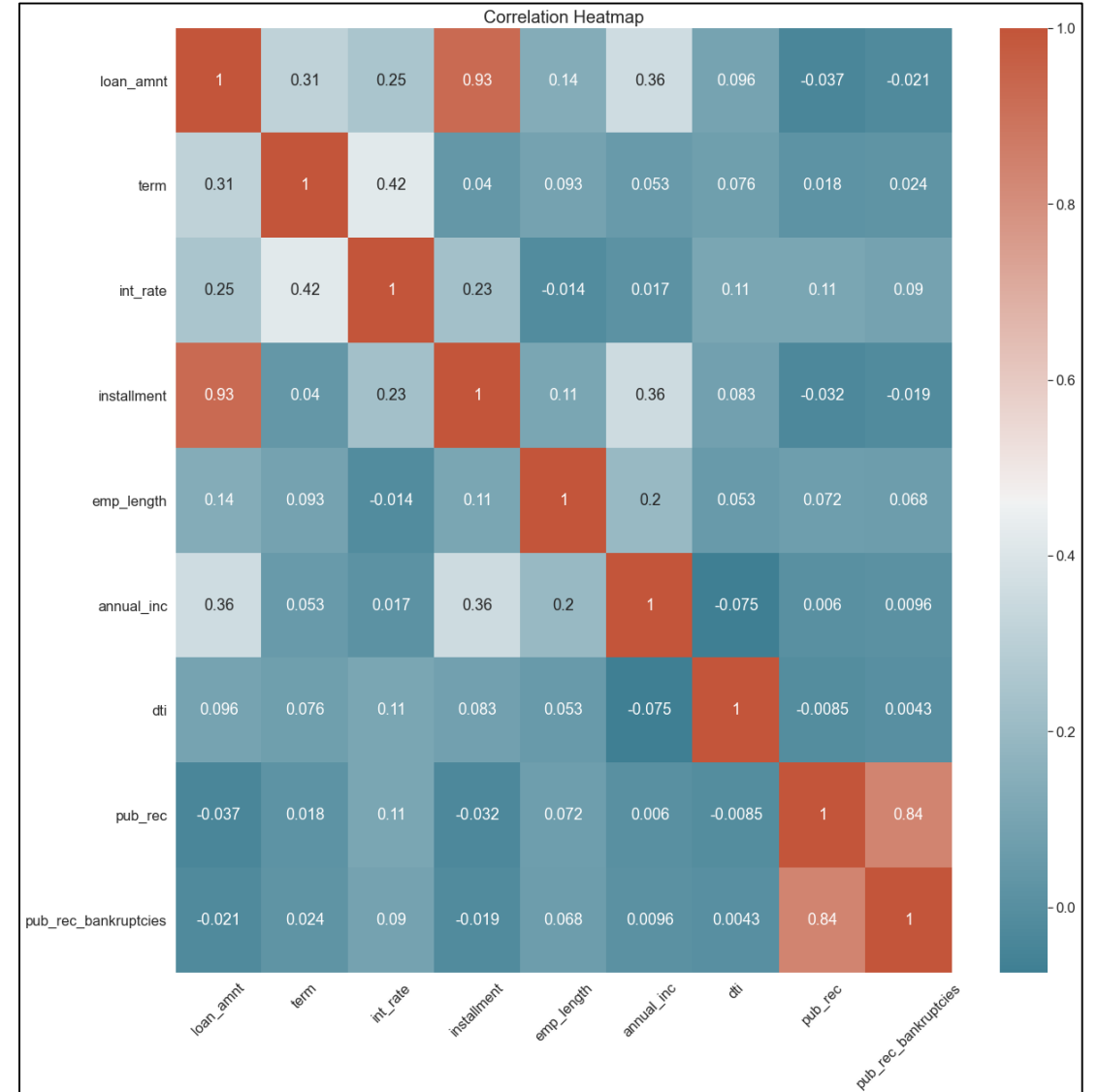
Observations:

1. Maximum number of loans were granted to borrowers from CA state.

Correlation Analysis of Quantitative Loan Variables

Observations:

1. Higher the employment length, lesser is the interest rate.
2. Higher the requested LC loan amount, lesser the debt-to-income ratio.
3. Higher the annual income, lesser the debt-to-income ratio.
4. Higher the annual income, lesser the term of loan repayment.
5. Higher the annual income, lesser the interest rate which leads to more chances of Fully Paid status for the granted loan.



Recommendations for Lending Club

Factors for granting Loans	Factors for rejecting Loans
1. To borrowers who has <u>lesser debt to income ratio</u> .	1. Avoid borrowers with <u>higher public bankruptcy records</u> .
2. Grant higher number of loans for <u>shorter terms</u> (e.g. 36 months).	2. Grant lesser number of loans for <u>higher terms</u> (e.g. 60 months)
3. <u>Higher annual income borrowers</u> should be considered.	3. Lower income borrowers should not be considered for <u>higher loan amounts</u> .
4. Borrowers with loan purpose of ' <u>major purchase</u> ', ' <u>wedding</u> ', ' <u>home</u> '.	4. Borrowers with loan purpose of ' <u>small business</u> ', ' <u>renewable energy</u> '.
5. Loan applicants with <u>OWNED house</u> or on <u>SECOND MORTGAGE</u> .	5. Loan applicants in <u>RENTED house</u> or <u>OTHER kinds of home ownership</u> .