

# **LENDING CLUB CASE STUDY SUBMISSION**

**Group Members:**

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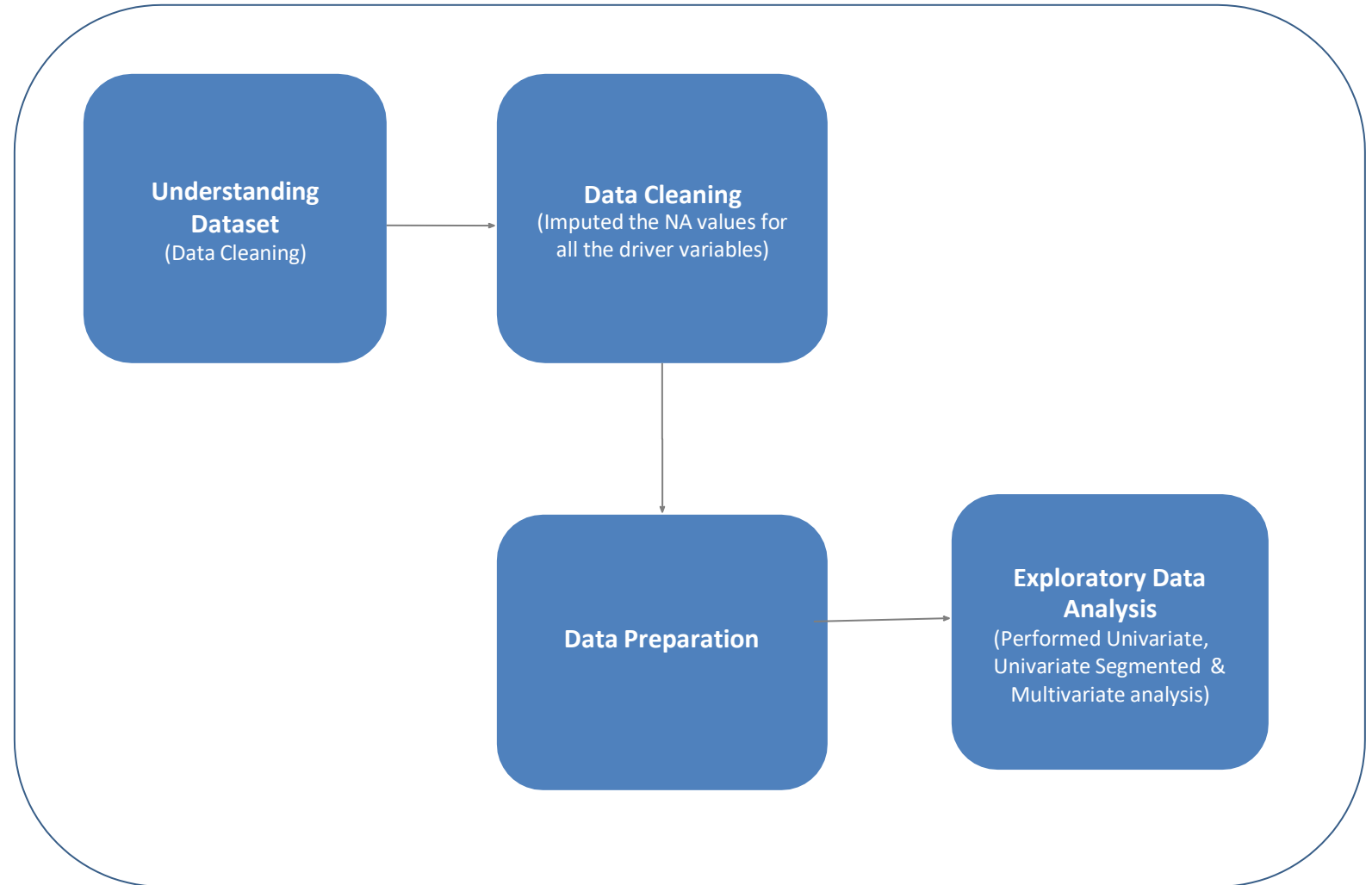
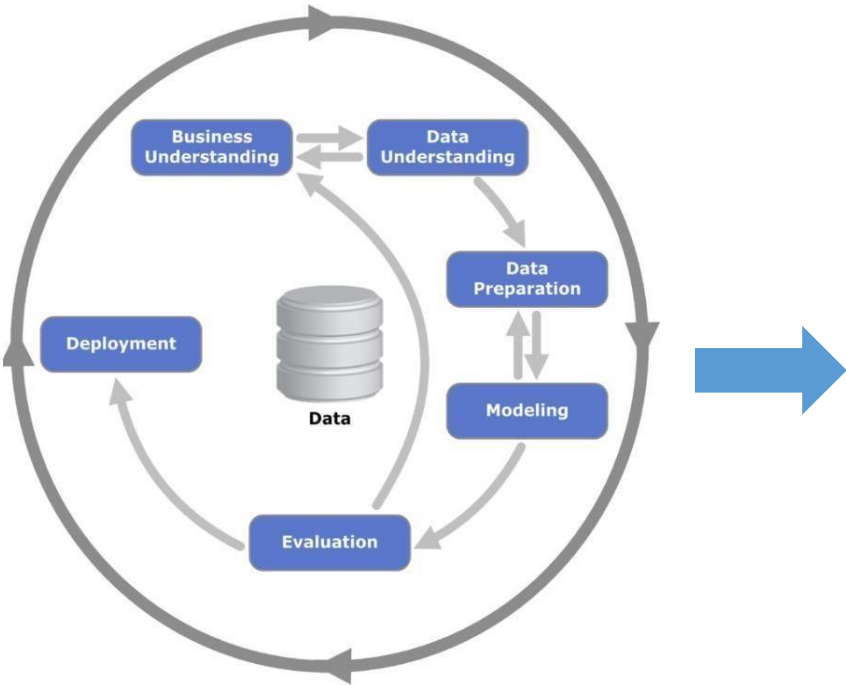
# Case Study Objectives

Identification of Loan Applicant traits that tend to 'default' paying back

Understand the 'Driving Factors' or 'Driver Variables' behind Loan Default phenomena

Loan Lending Organizations may choose to utilize this knowledge for its portfolio and risk assessment of new loan applicants

# Problem solving methodology using CRISP-DM



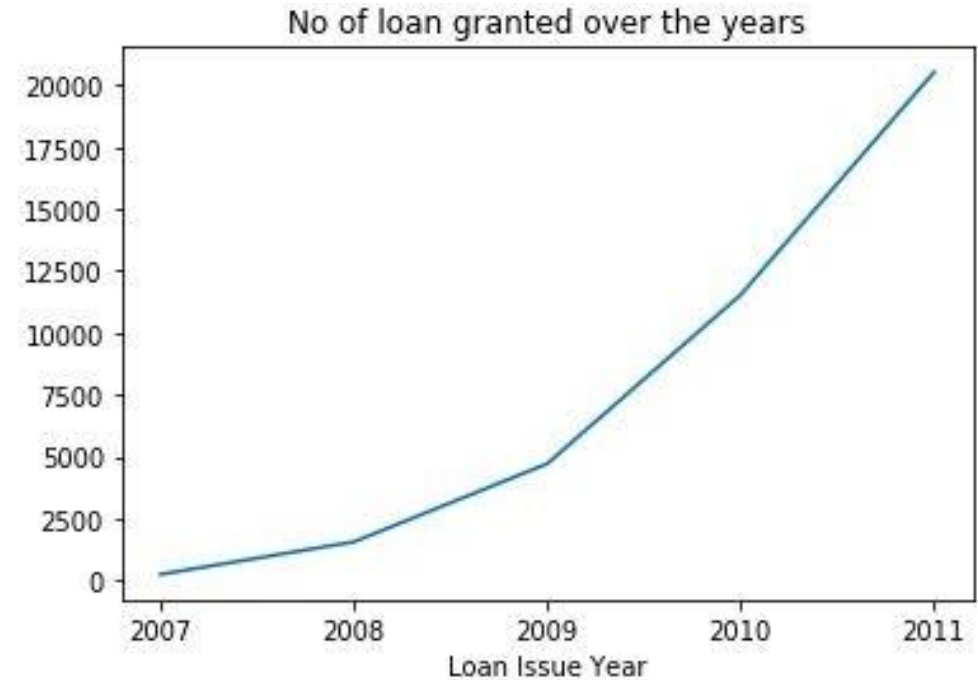
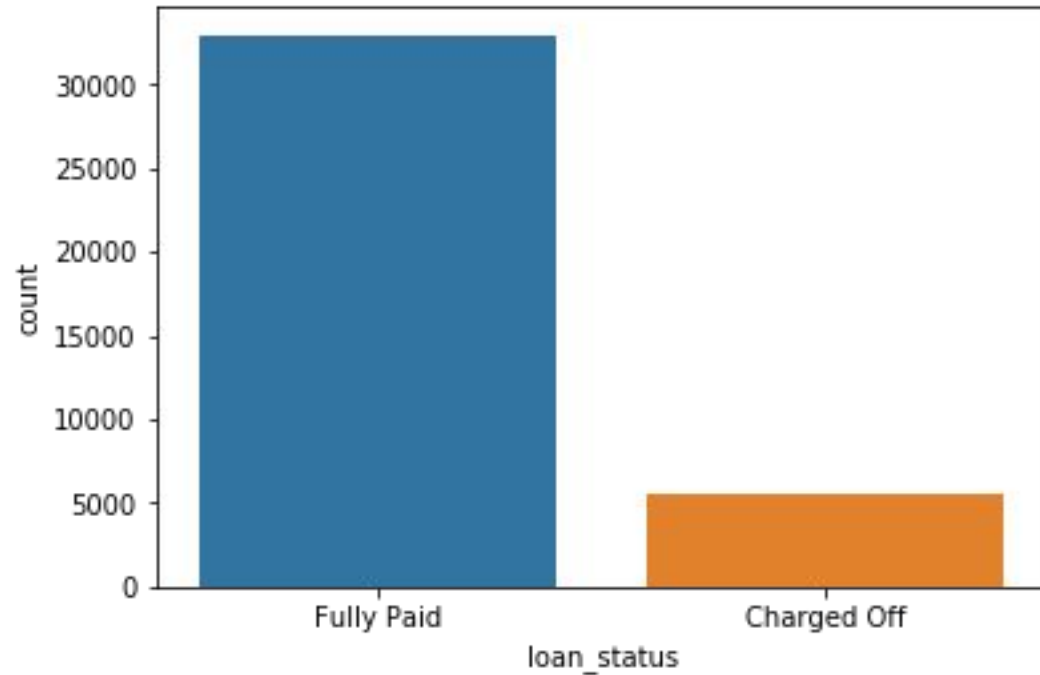
# Data Cleaning Steps

- **Delete columns:** Delete unnecessary columns.
- **Remove outliers:** Remove high and low values that would disproportionately affect the results of your analysis.
- **Missing values:** Treat missing values with appropriate approach.
- **Duplicate data:** Remove identical rows, remove rows where some columns are identical.
- **Filter rows:** Filter by segment, filter by date period to get only the rows relevant to the analysis.

# Analysis

- The essence of the whole project is to analyze and understand how consumer attributes and loan attributes are influencing the tendency of defaulting.
- We performed **data cleaning and preparation** on the Loan dataset:
  - Imputed the NA values for all the variables
  - Created two new columns:
    - Profit and Loss column
    - Ratio of funded amount and annual income
- During **univariate analysis** we have created:
  - Histograms and Bar charts to check out the distribution of all the driver variables
  - Box plots to detect the Outliers
  - Performed the Multivariate analysis to understand how different variables interact with each other.

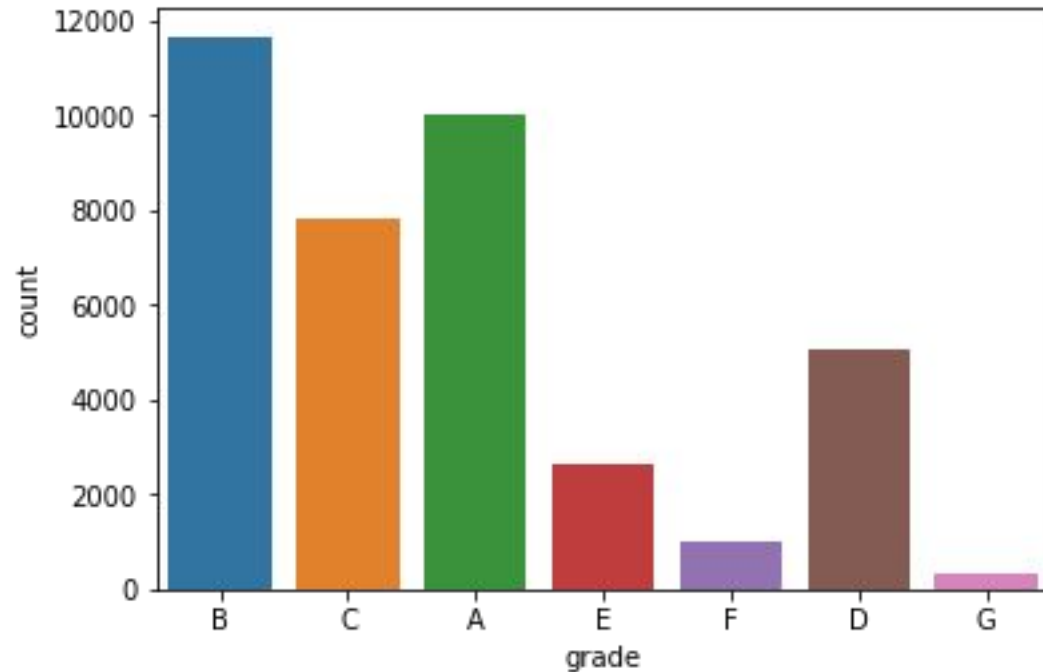
# Loan Status Analysis



## Observations:

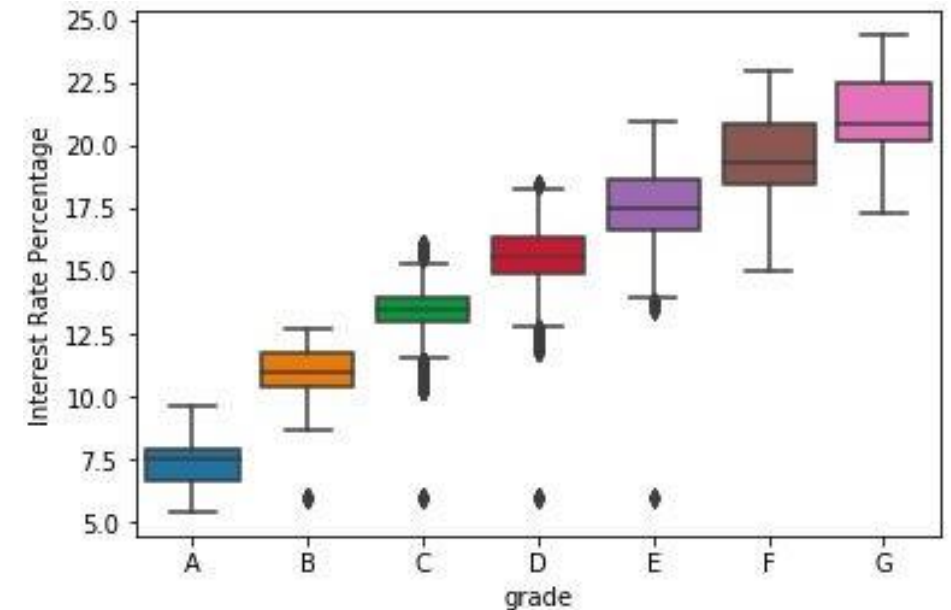
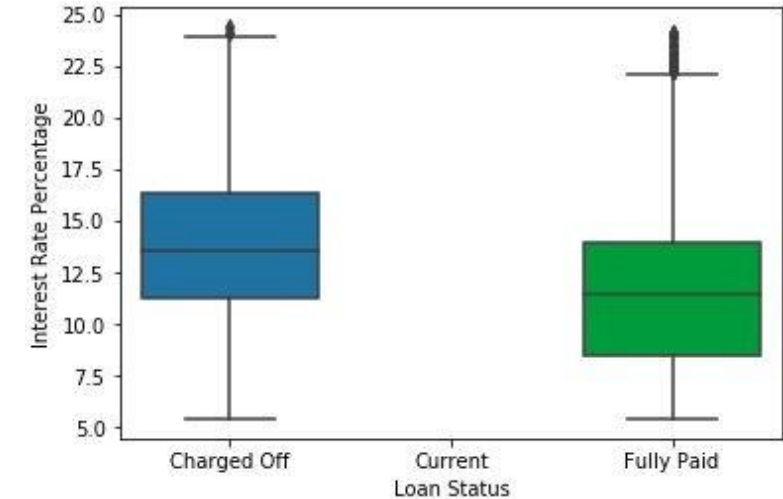
1. Most of the loans are Fully Paid.
2. About 14% of loan are having status as defaulters.
3. The loan has been increasing exponentially over the years.

# Loan Grade Analysis

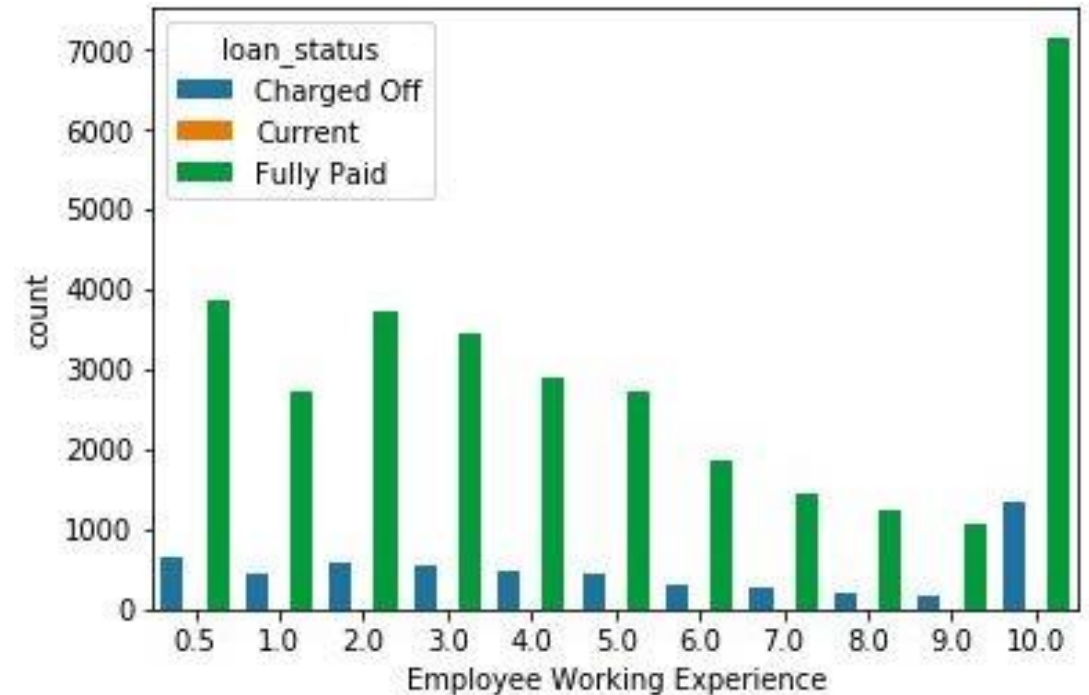
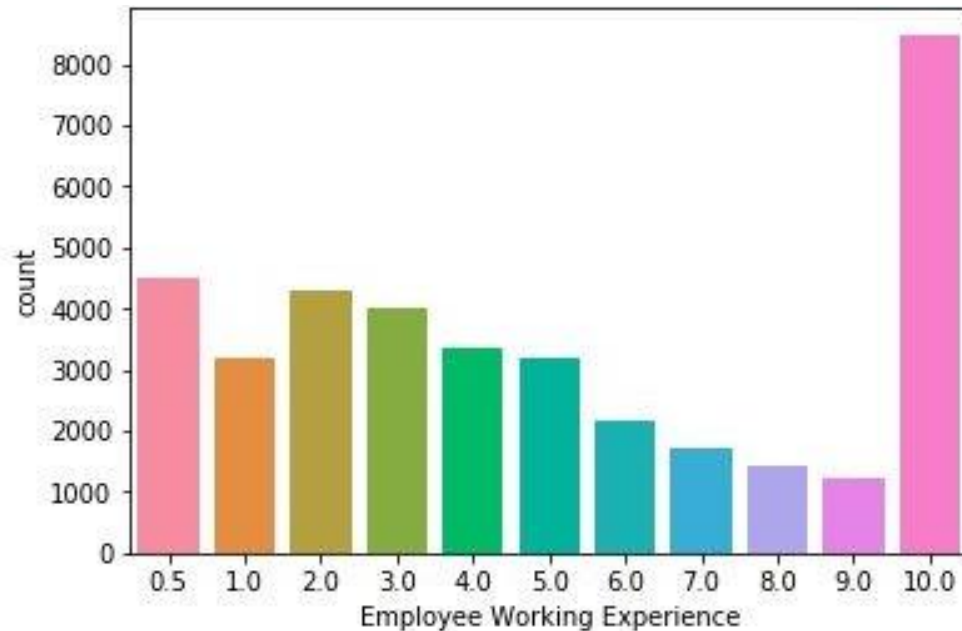


## Observation:

1. Most of the loans have grade of A and B. Therefore stating most of the loans are high graded loans.
2. High Quality loans have low interest rate.
3. Which depicts, higher interest rate have higher tendency to default the loan.



# Loan Applicants work Experience Analysis

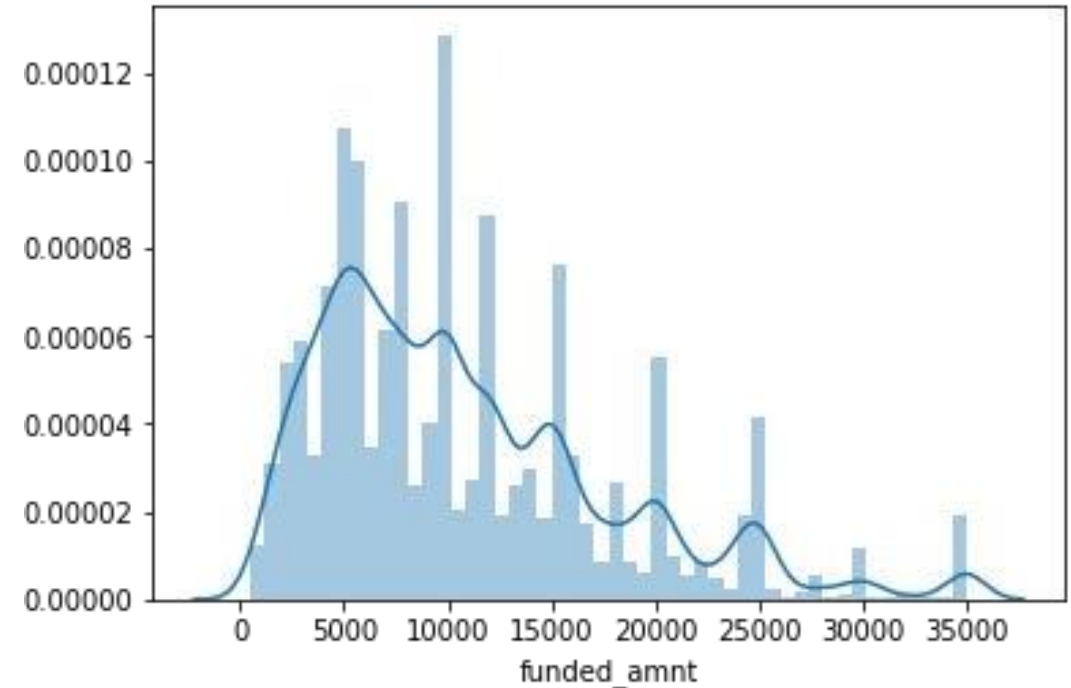
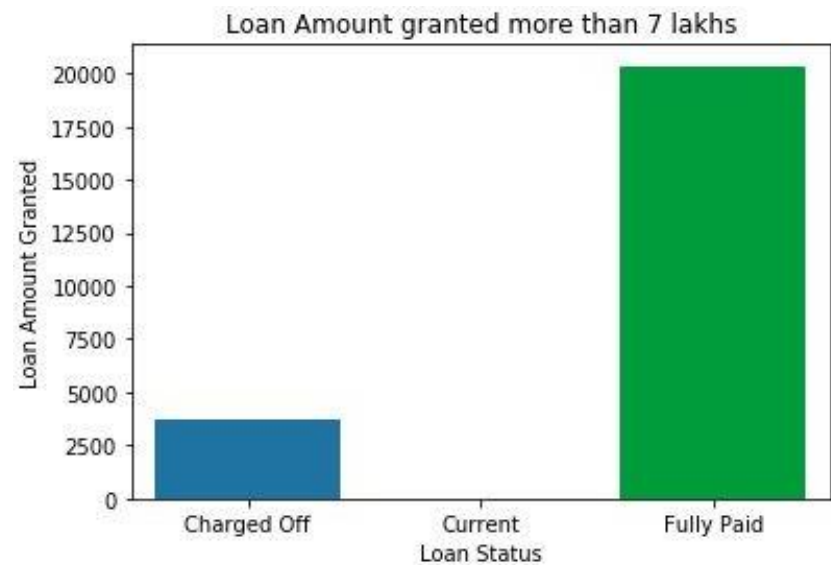
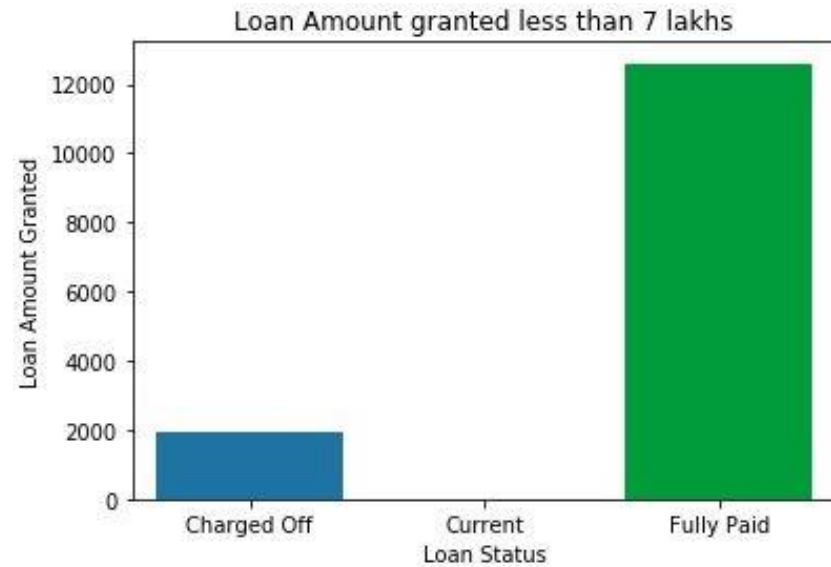


## Observation:

1. Majority of employees applying for the loan have more than 10 years of experience
2. Tendency of person to default the loan with 10 years of experience is also high. So company need to be careful when granting loan.



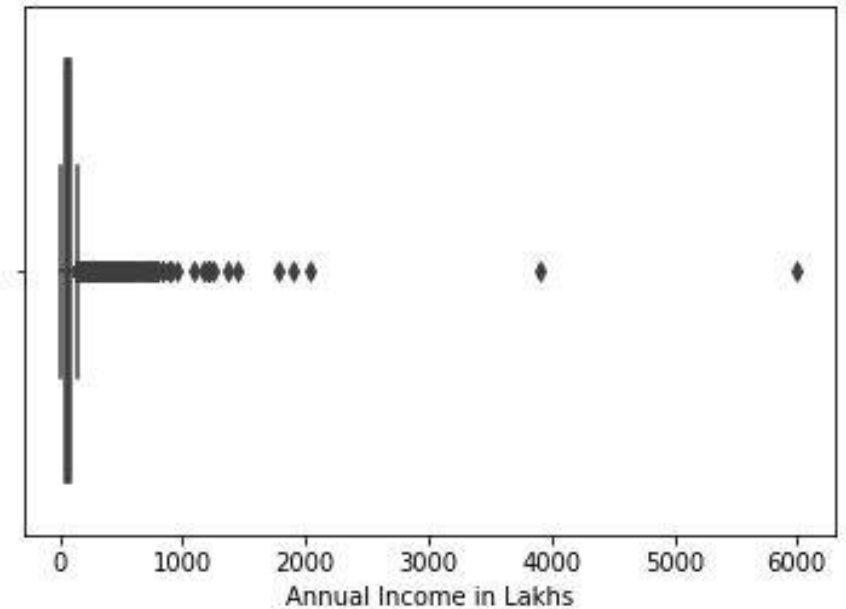
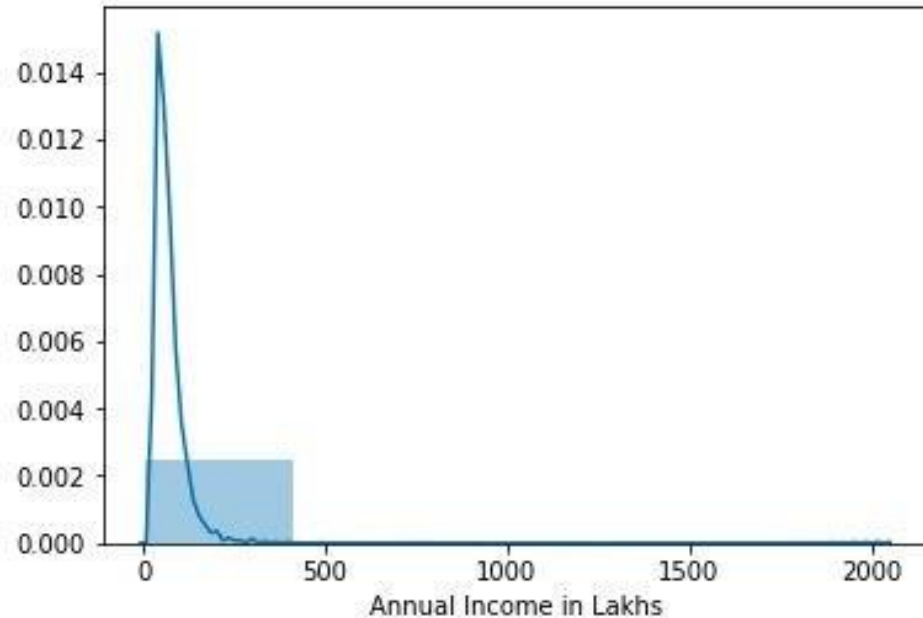
# Loan Amount Analysis



## Observation:

1. Funded amount is left skewed. Most of the loan amount given is below 7 lakhs.
2. Probability of people with loan amount greater than 7 lakhs tends to default is more than the people with less than 7 lakh

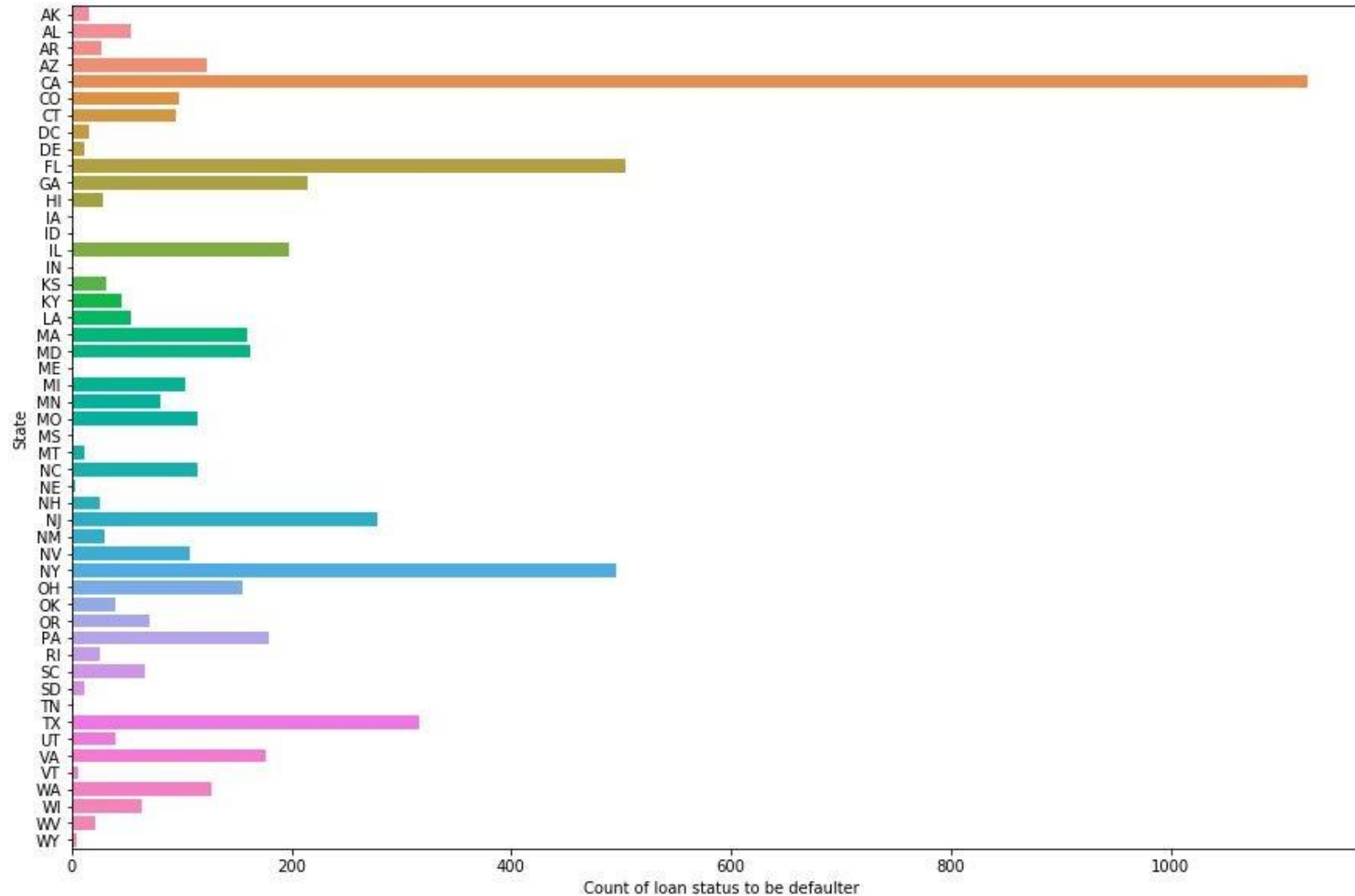
# Income Analysis for the loan applicants



## Observation:

1. Most of the applicants have income between 0 to 5 lakhs.
2. There are two applicants having income above 30 lakhs

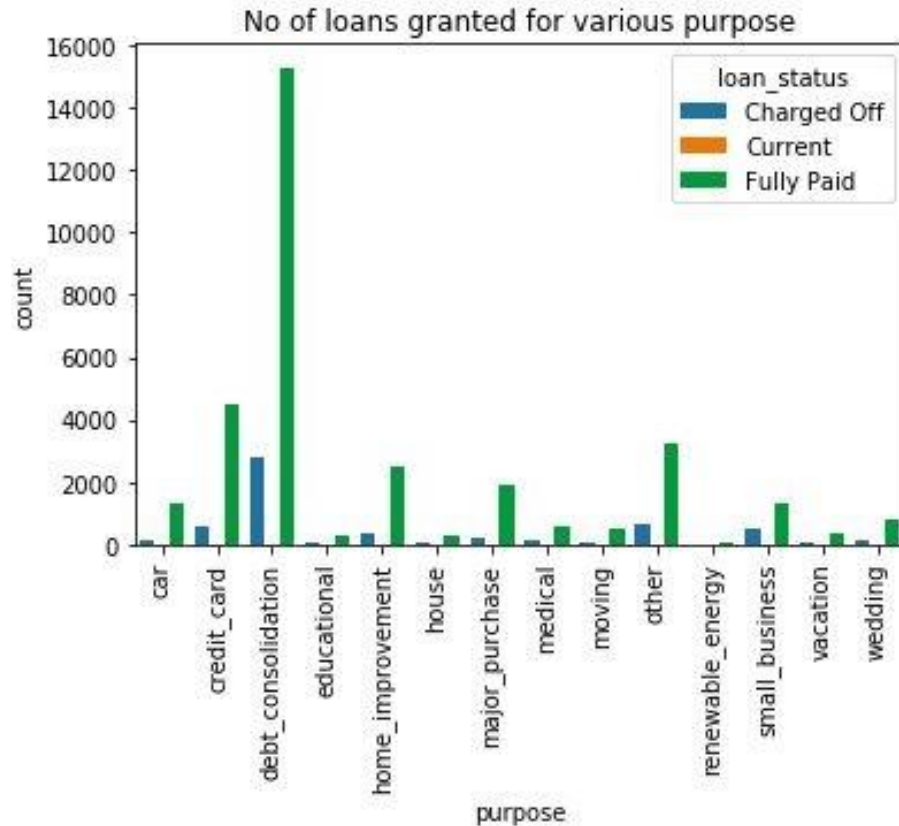
# Loan Defaulters by State Analysis



## Observation:

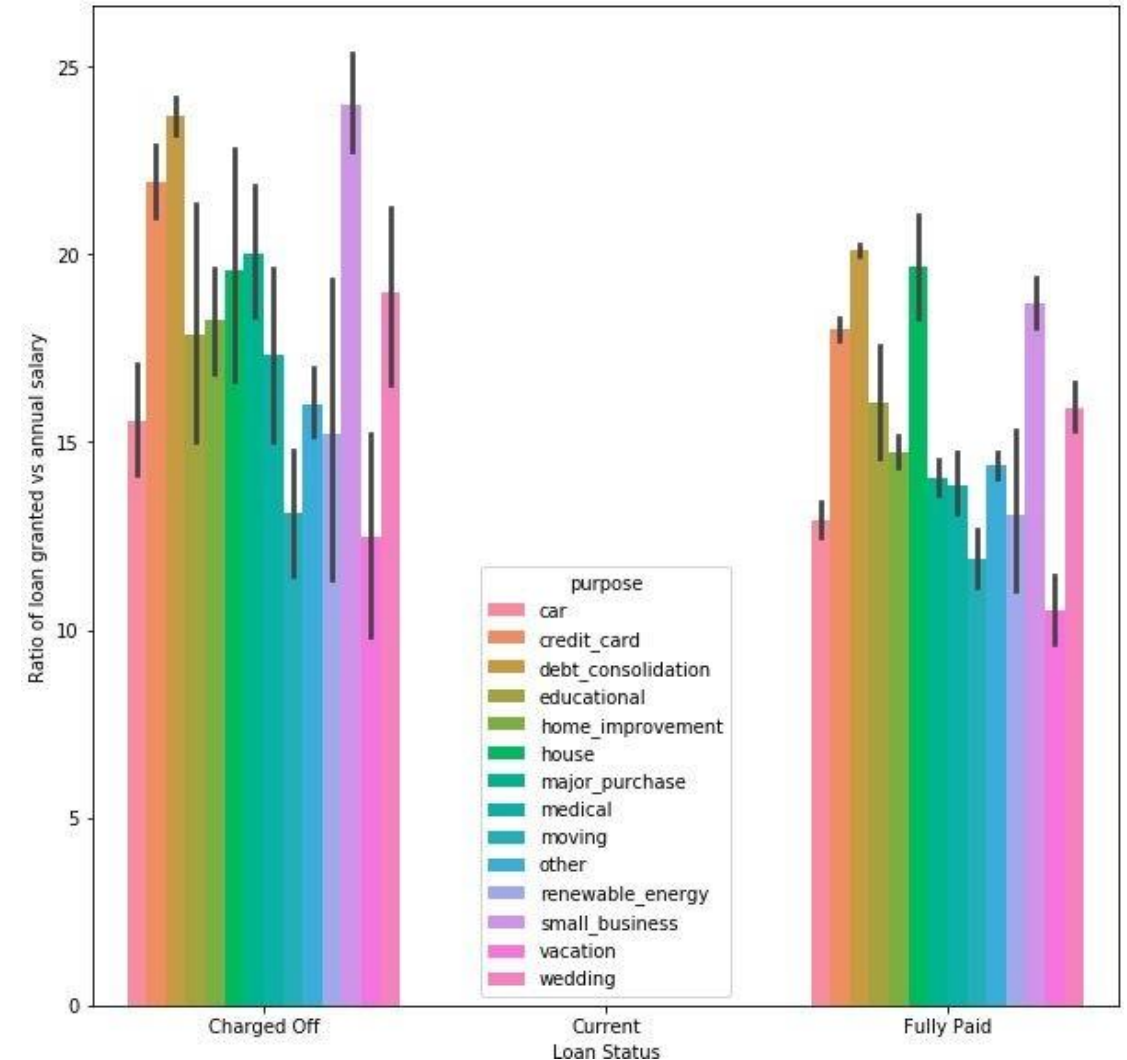
Applicants from state CA have high tendency to default the loan

# Purpose for applying Loan Analysis

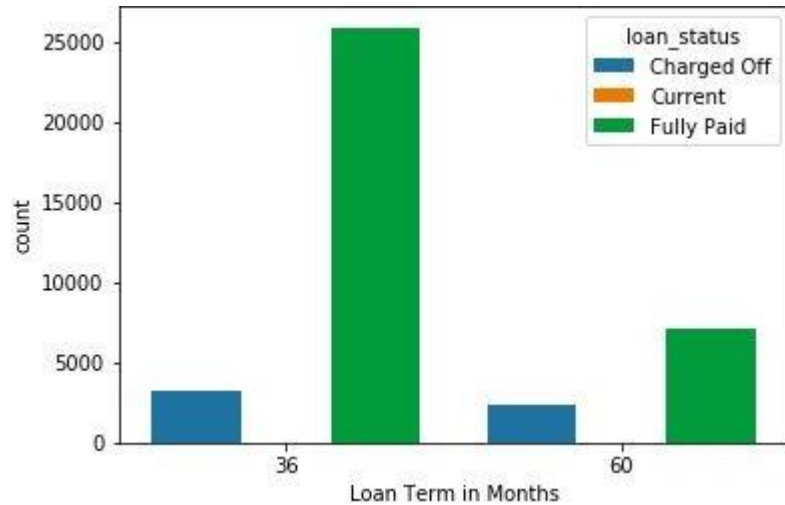


## Observation:

1. Most of the loans are granted were for debt consolidation.
2. Applicants having higher income tends to default the loan.

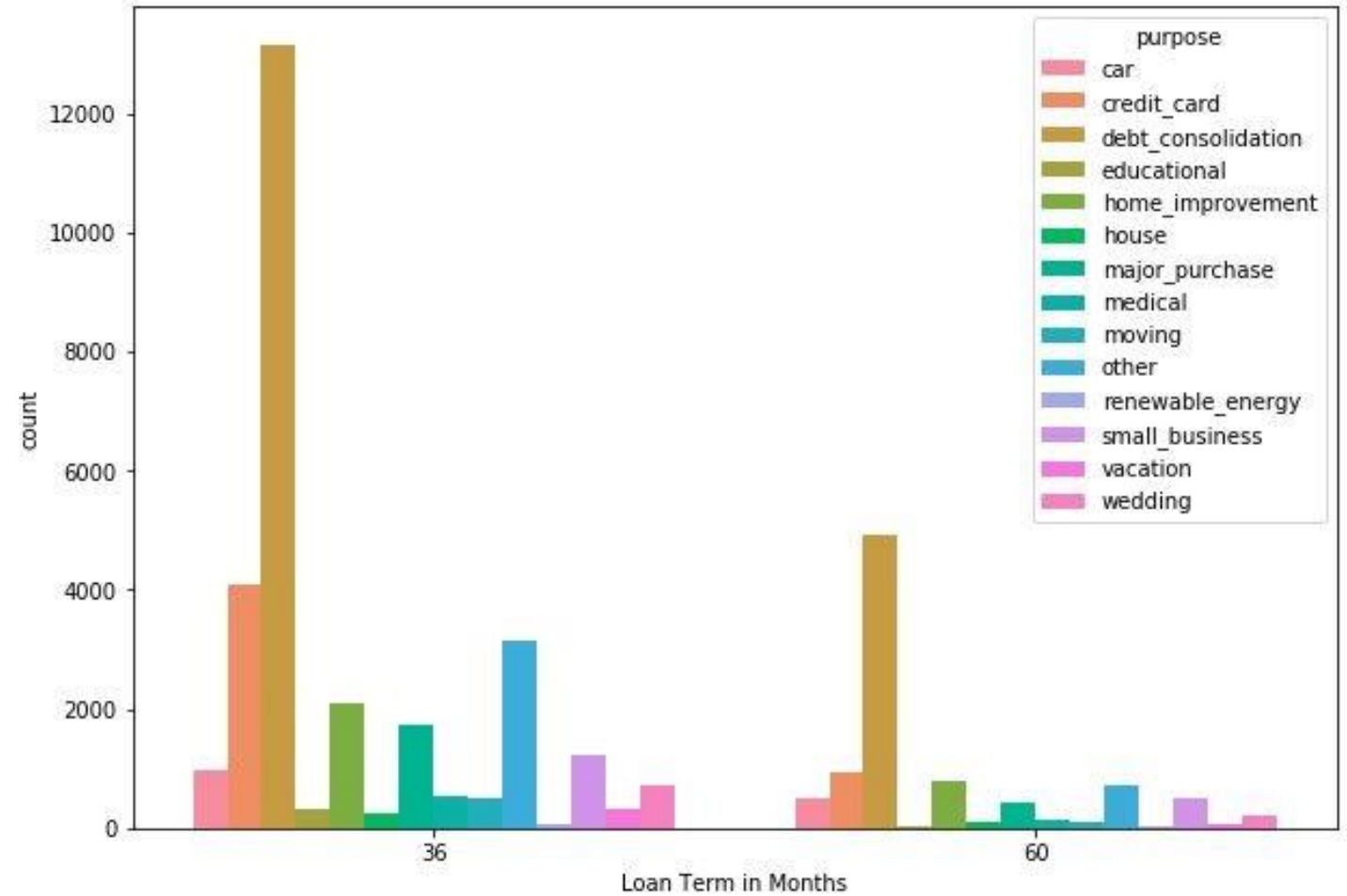


# Loan Status vs Loan Tenure

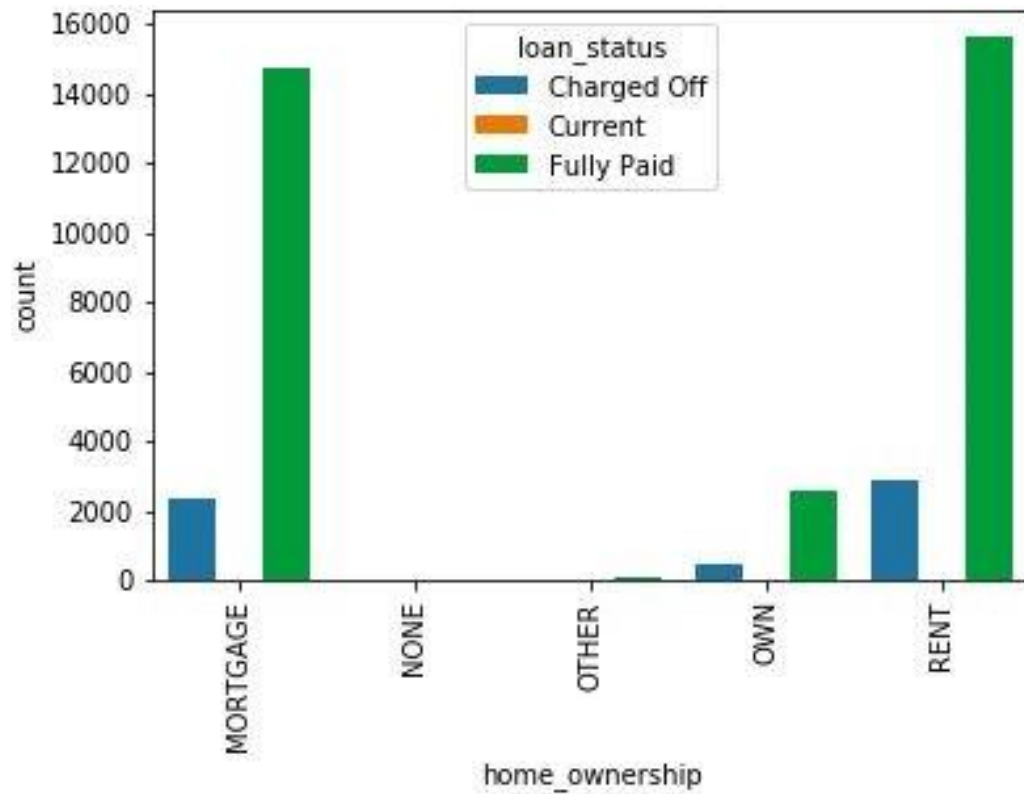


## Observation:

1. Most of the loans granted were of 36 months.
2. And loans granted for 36 months have slightly high tendency to default.
3. Additionally, Debt Consolidation is the most common purpose and loans are granted for 36 months and 60 months.



# Loan Status by Home Ownership



## Observation:

Applicants having their home rented or on mortgage have almost equal tendency to default the loan.



# Conclusion

## Results



- Applicants taking loan for 'home improvement' and have income of 60k -70k
- Applicants whose home ownership is 'MORTGAGE and have income of 60-70k
- Applicants who receive interest at the rate of 21-24% and have an income of 70k-80k
- Applicants who have taken a loan in the range 30k - 35k and are charged interest rate of 15-17.5 %
- Applicants who have taken a loan for small business and the loan amount is greater than 14k
- Applicants whose home ownership is 'MORTGAGE and have loan of 14-16k
- When grade is F and loan amount is between 15k-20k
- When employment length is 10yrs and loan amount is 12k-14k
- When the loan is verified, and loan amount is above 16k
- For grade G and interest rate above 20%