

# **LENDING CLUB CASE STUDY SUBMISSION**

**Group Members:**

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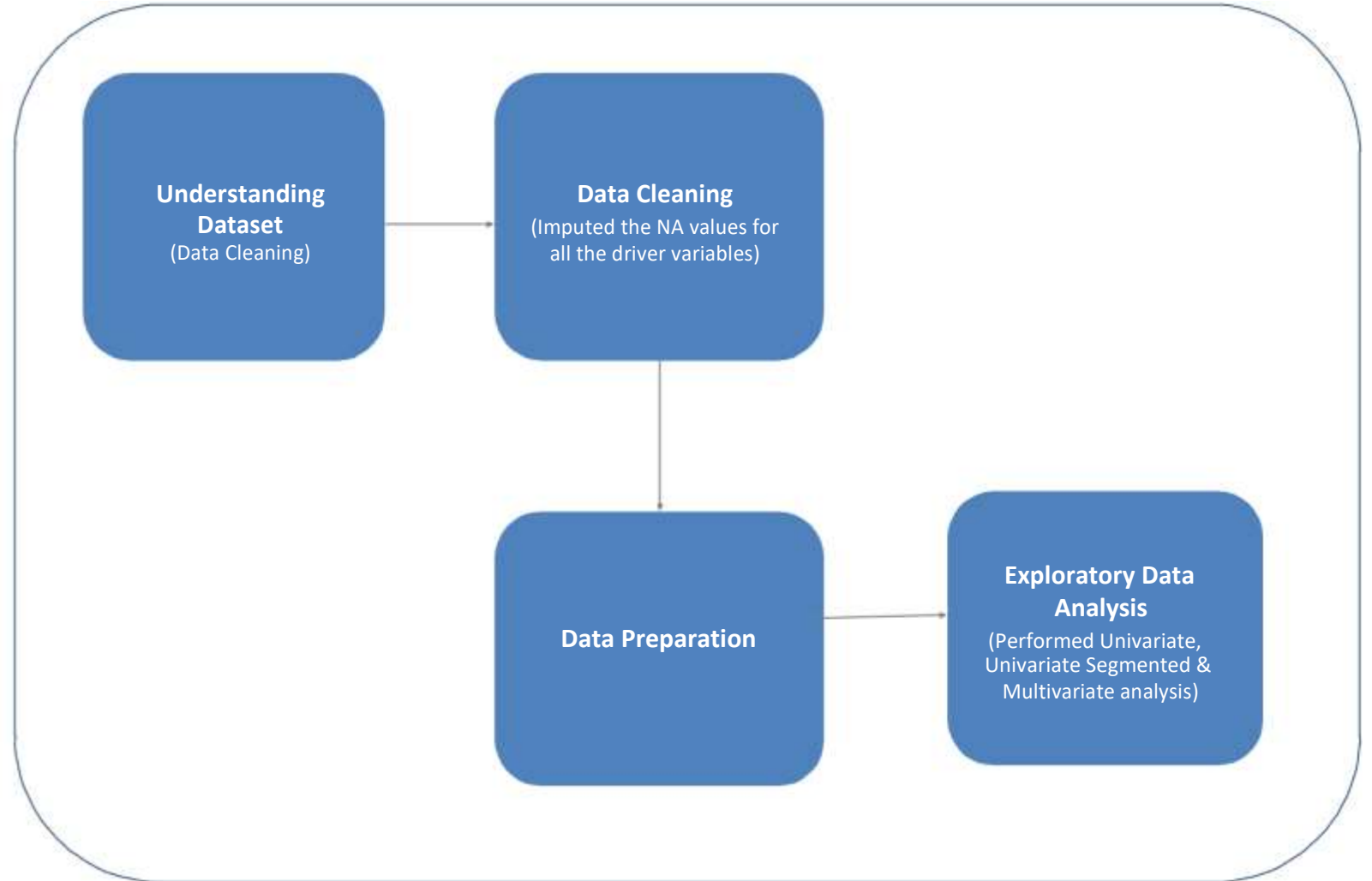
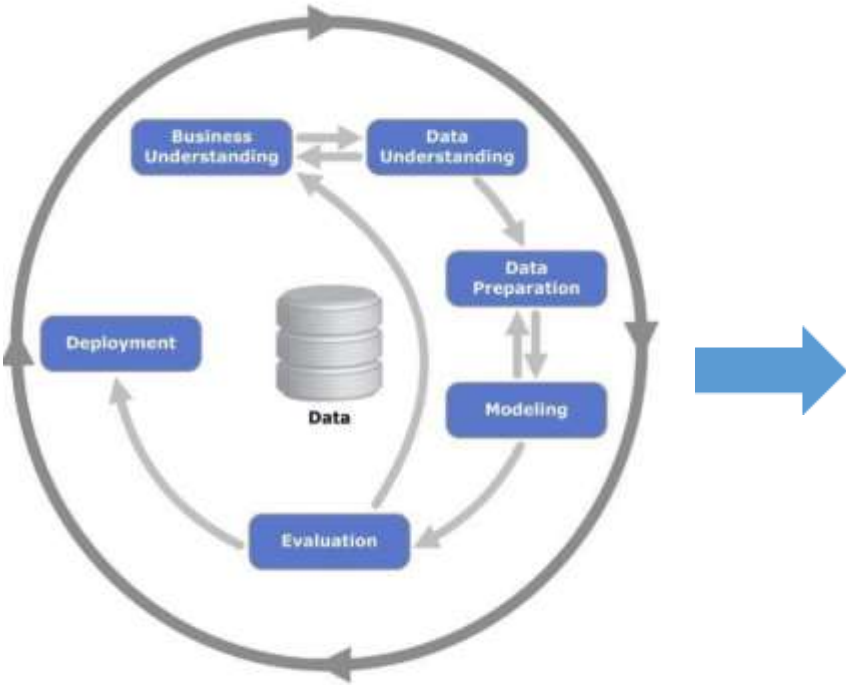
# Case Study Objectives

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



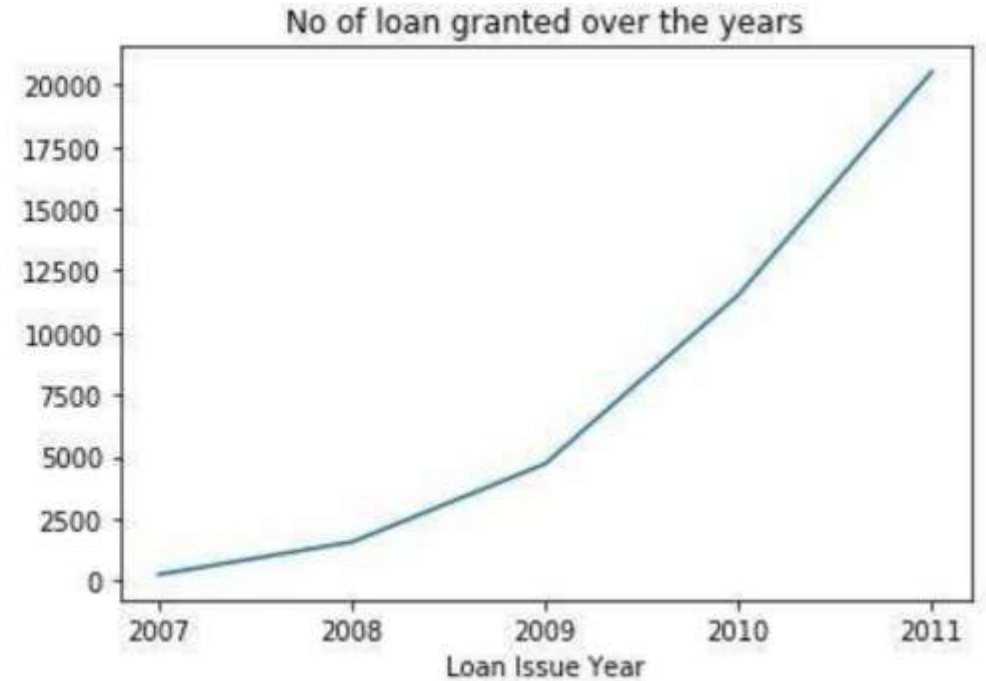
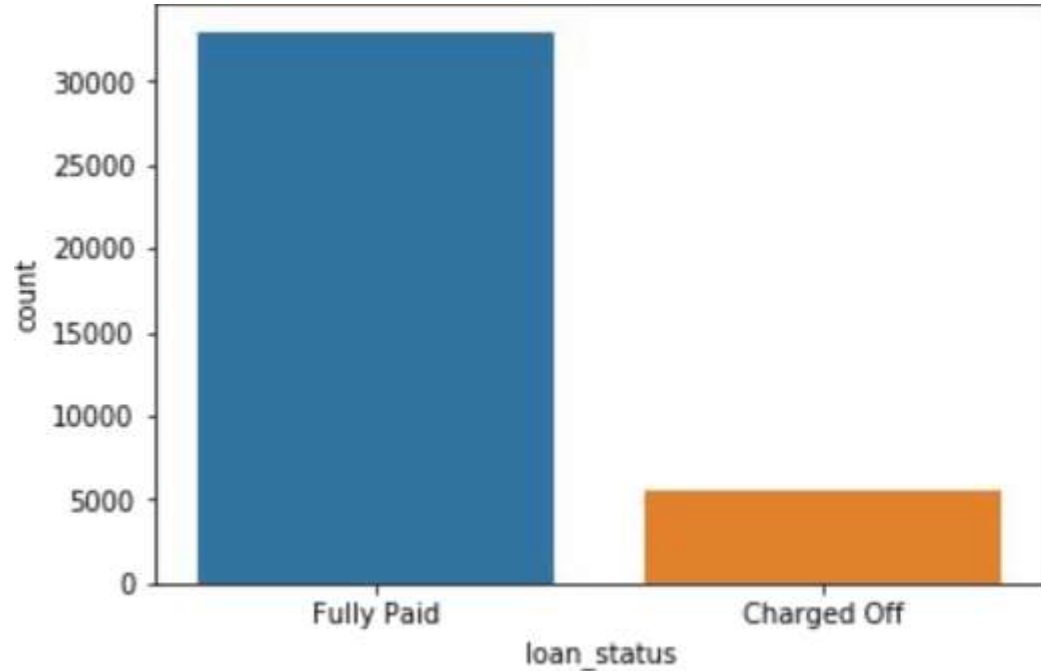
# Data Cleaning Steps

- **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.

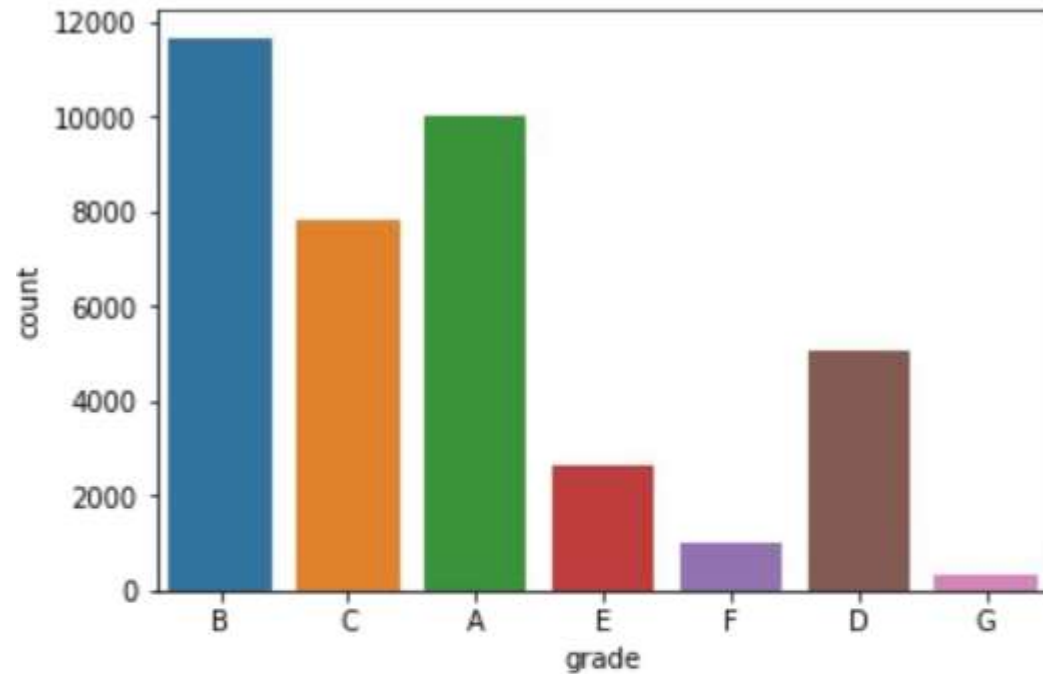
# Loan Status Analysis



## Observations:

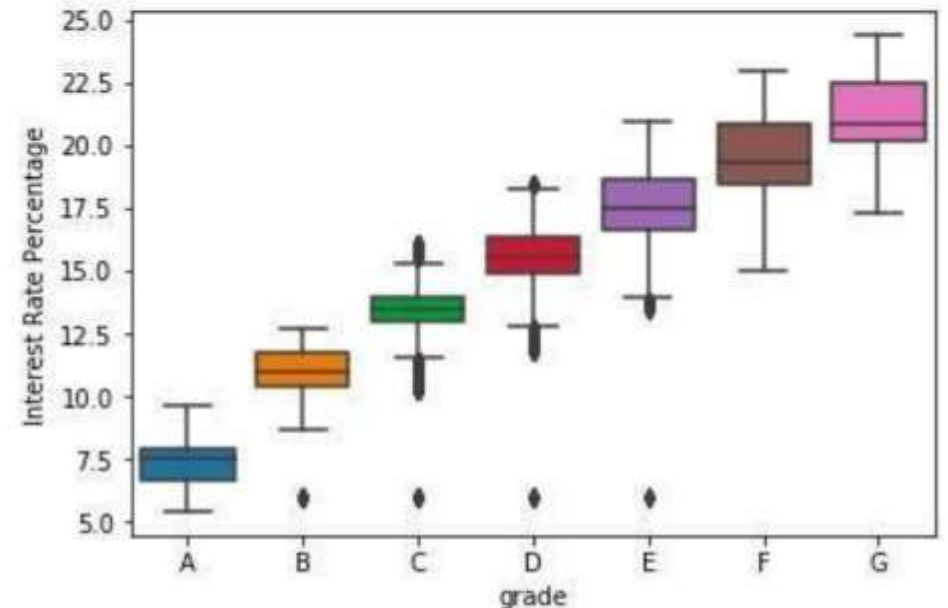
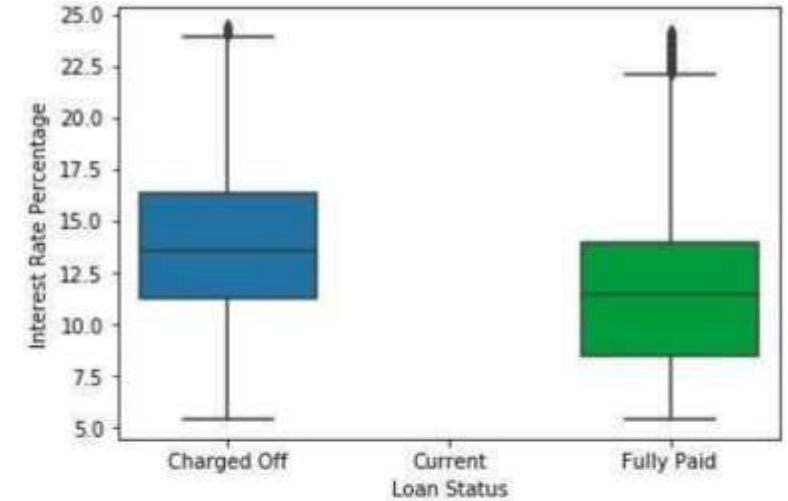
1. Most of the loans are Fully Paid.
2. About 14% of loan are having status as defaulters.
3. The loan has been increasing exponentially over the years.

# Loan Grade Analysis

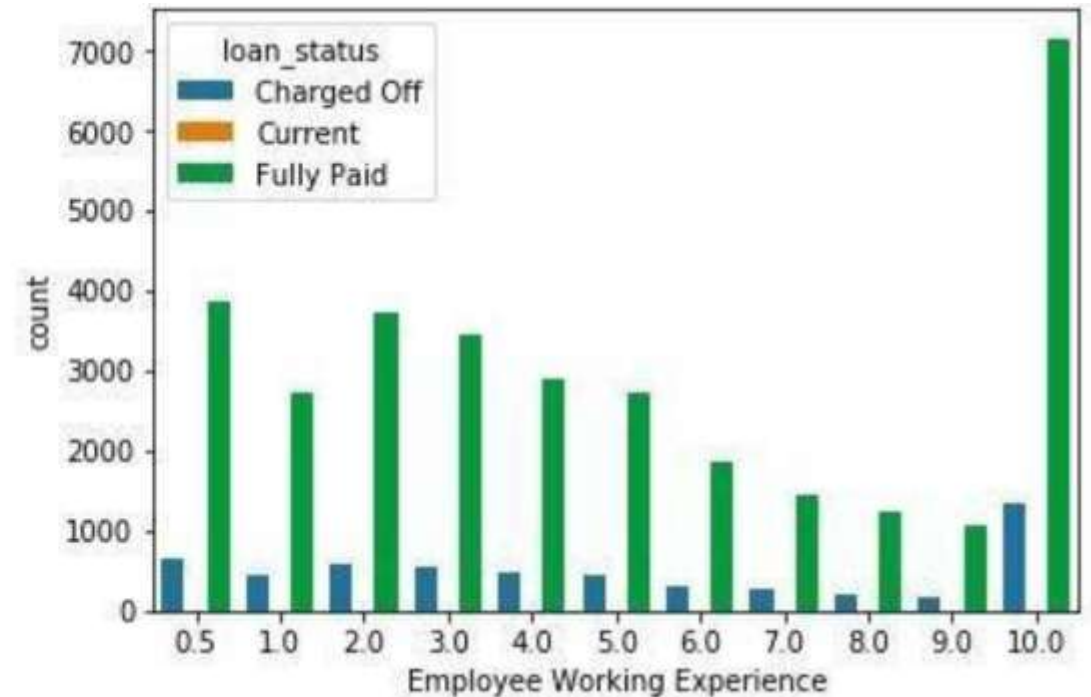
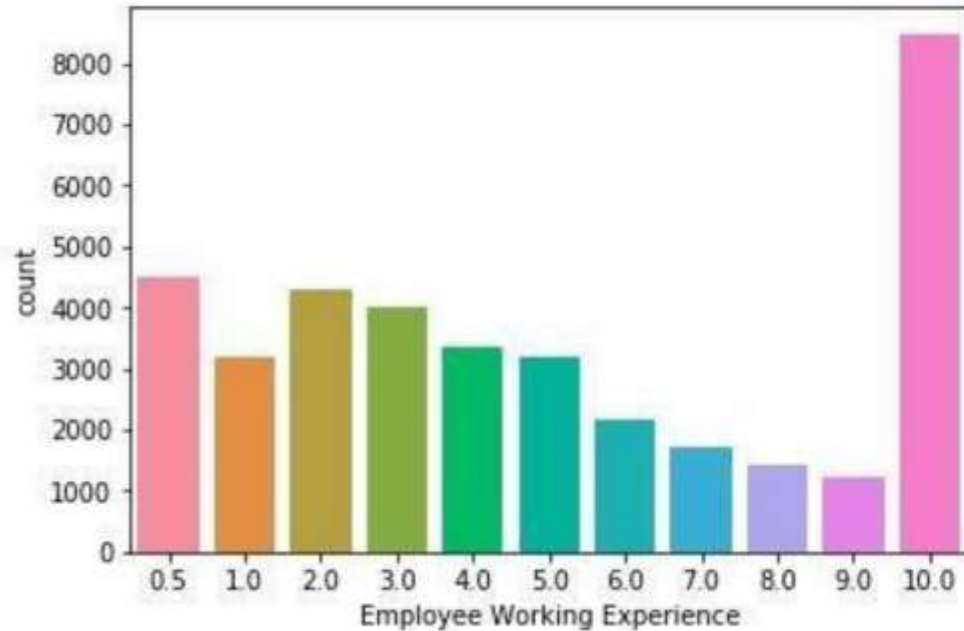


## Observation:

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

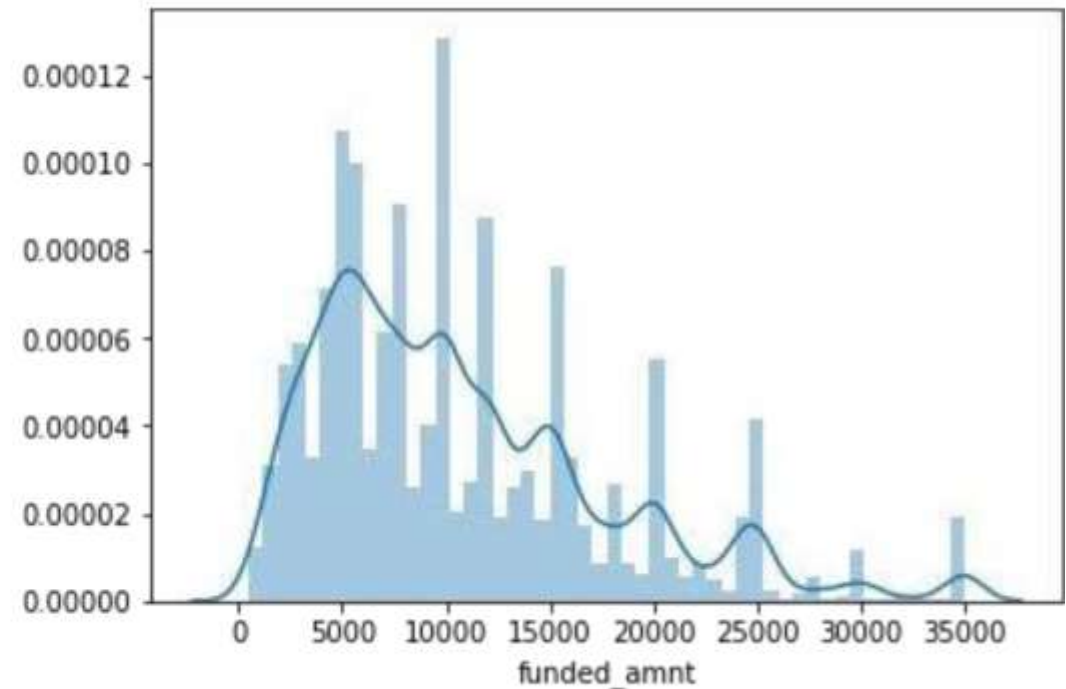
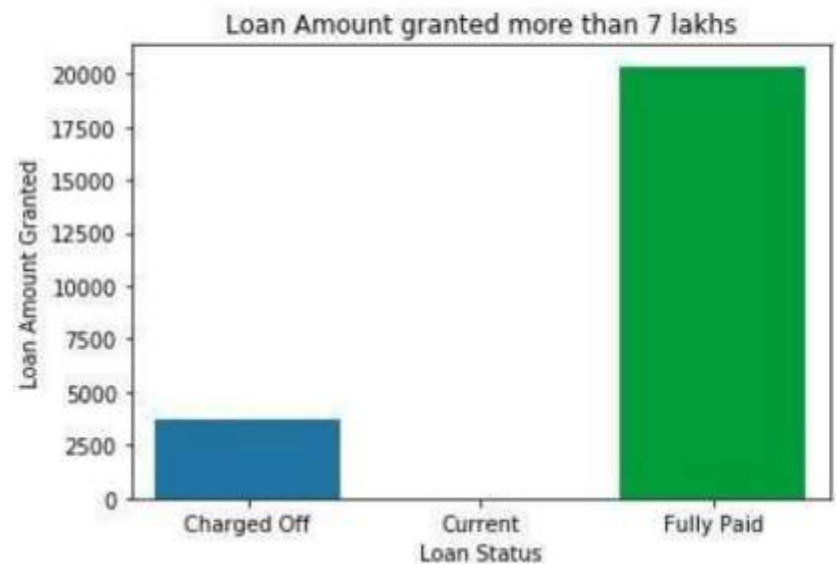
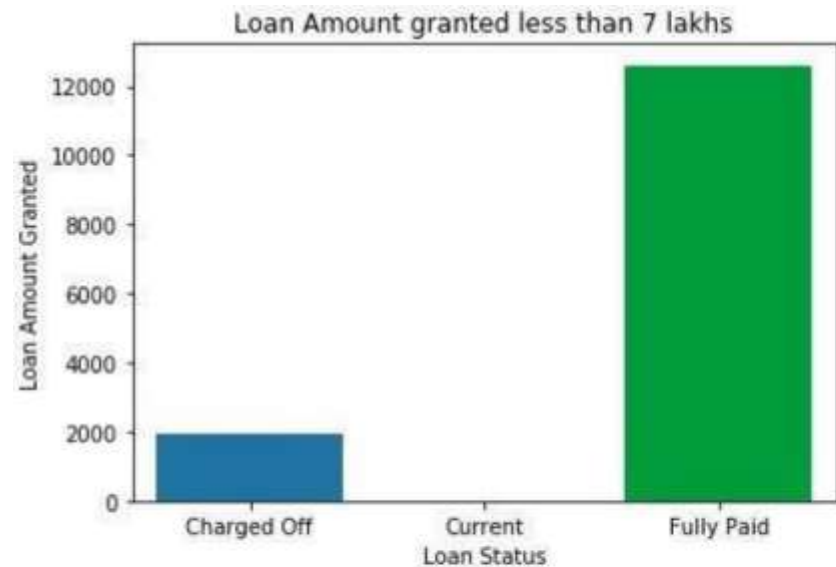


## Observation:

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.



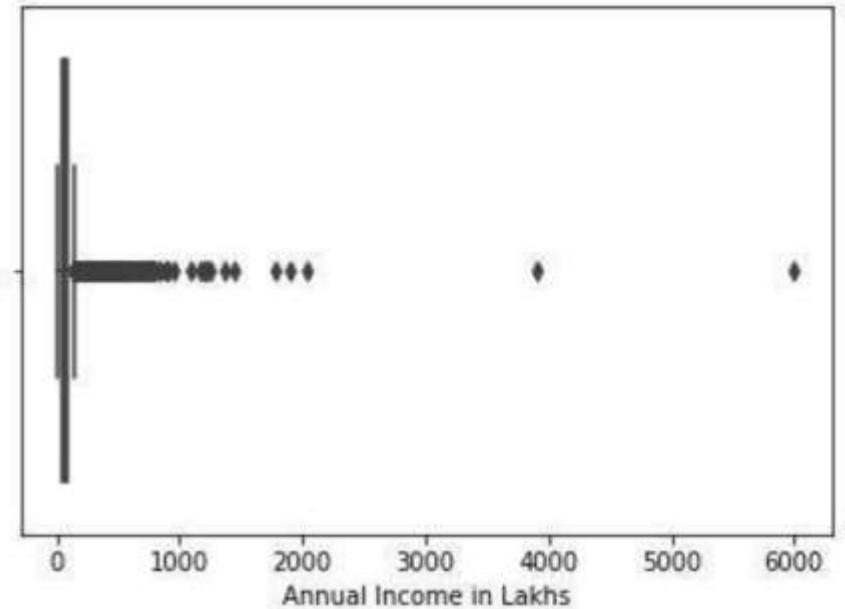
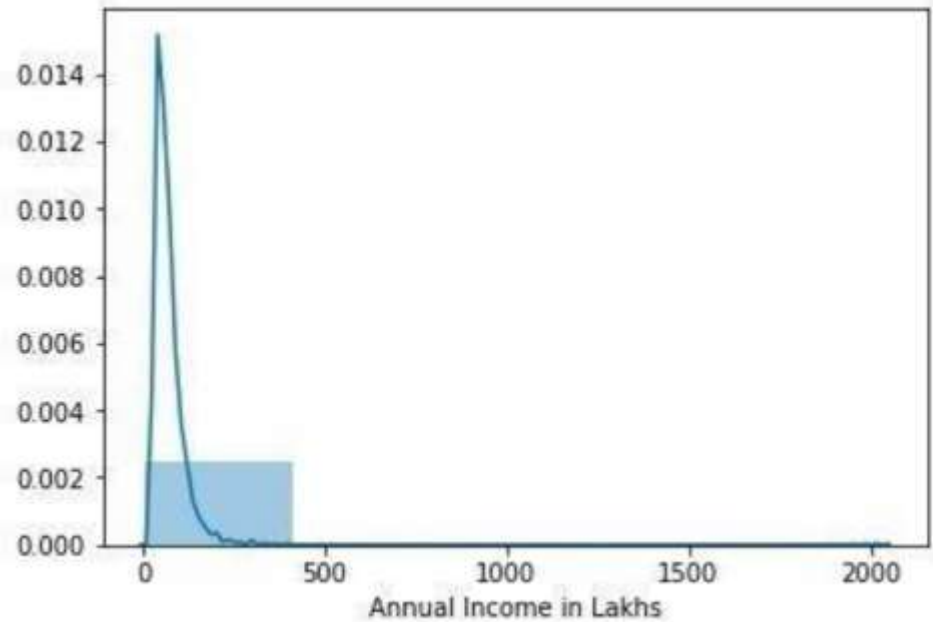
# Loan Amount Analysis



## 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

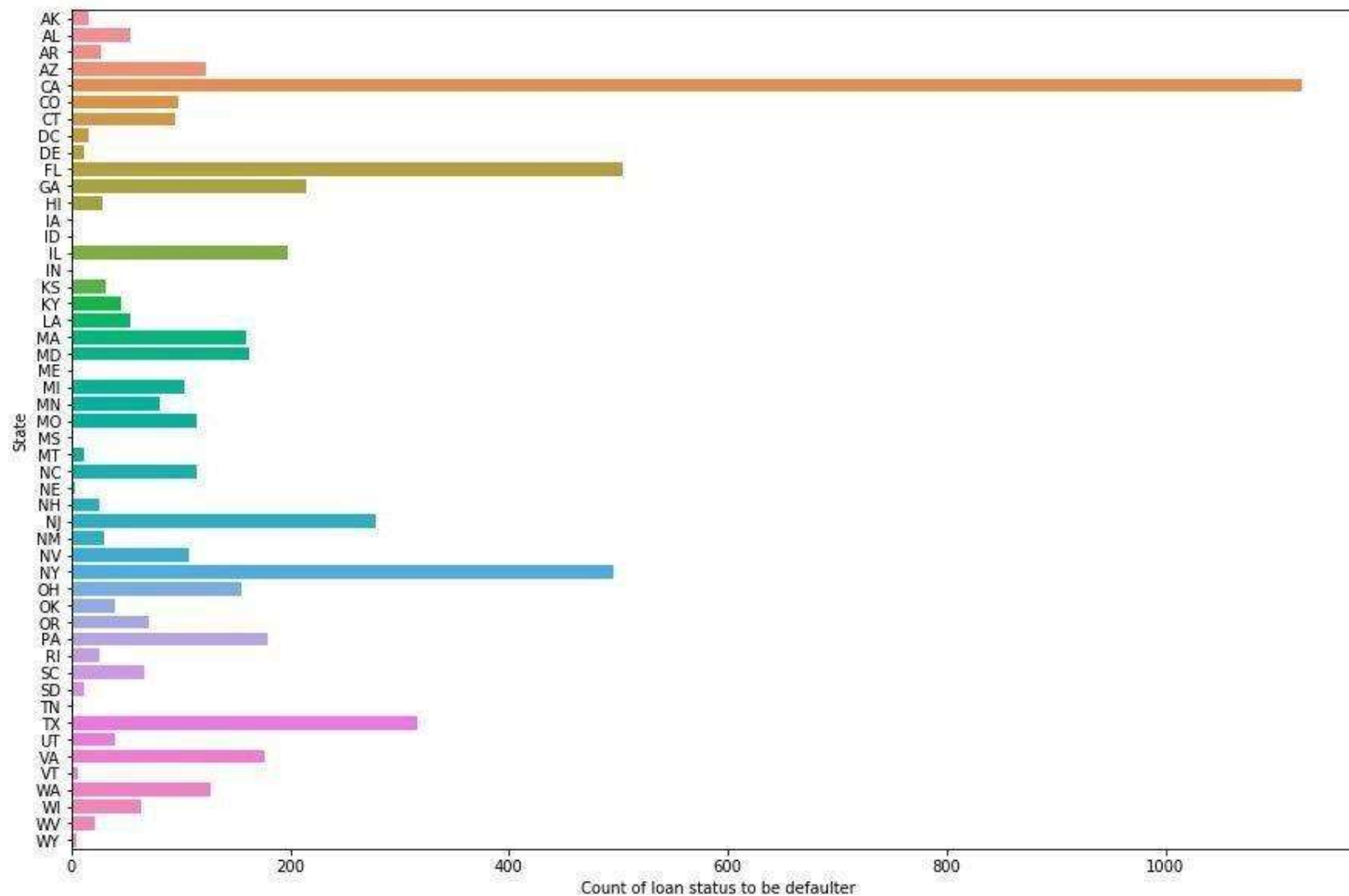
# Income Analysis for the loan applicants



## Observation:

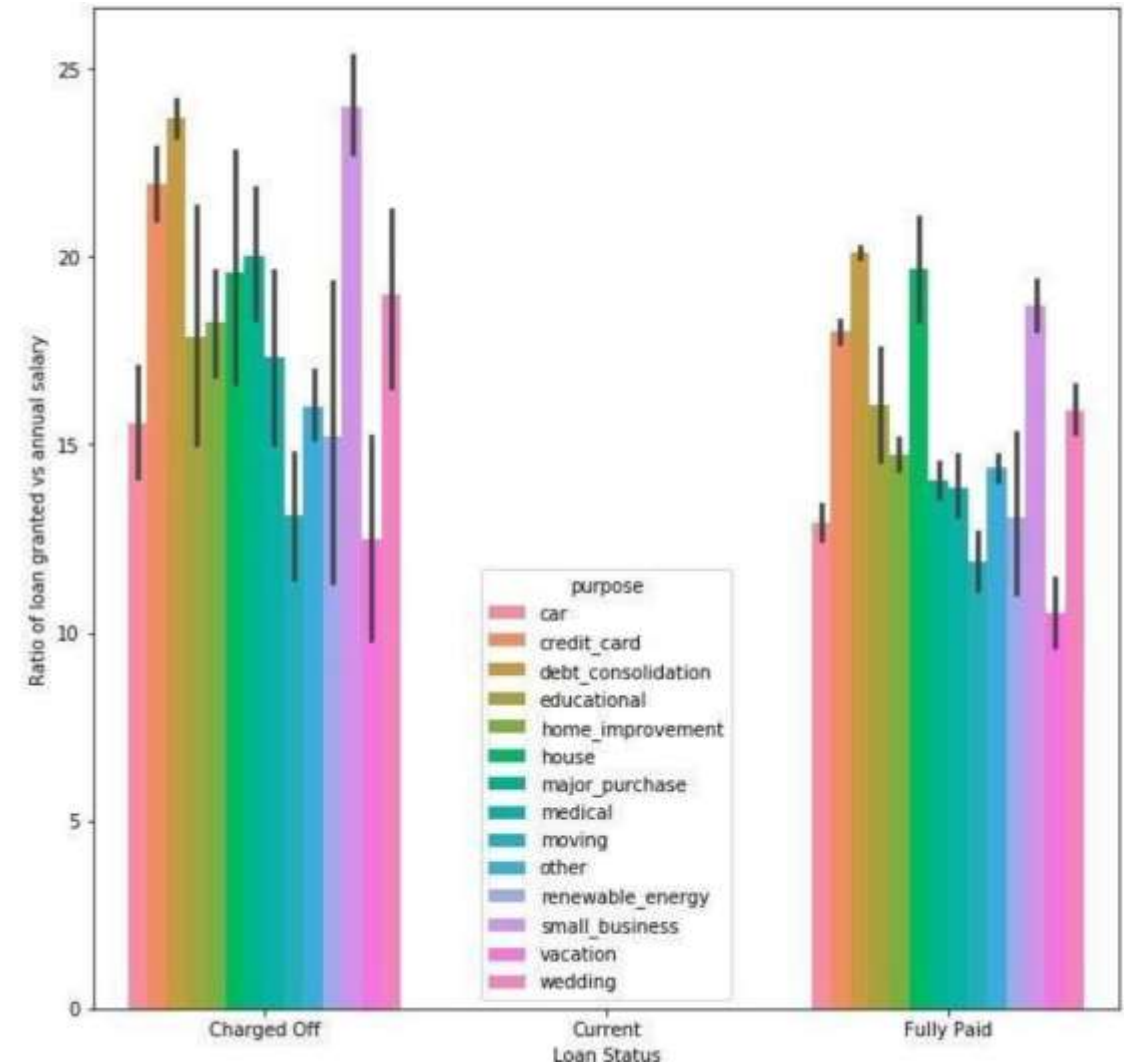
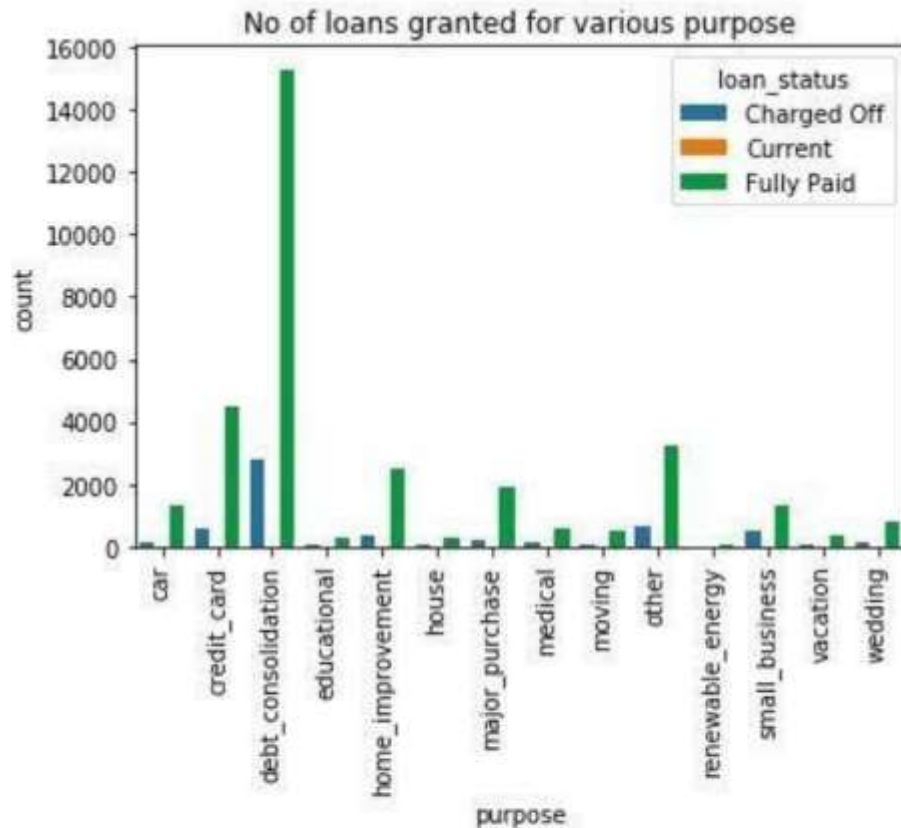
1. Most of the applicants have income between 0 to 5 lakhs.
2. There are two applicants having income above 30 lakhs

# Loan Defaulters by State Analysis



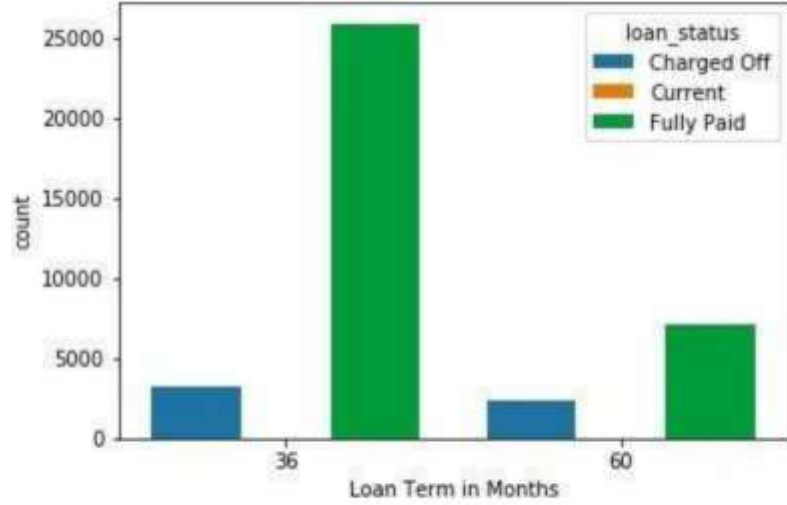
**Observation:** Applicants from state CA have high tendency to default the loan

# Purpose for applying Loan Analysis



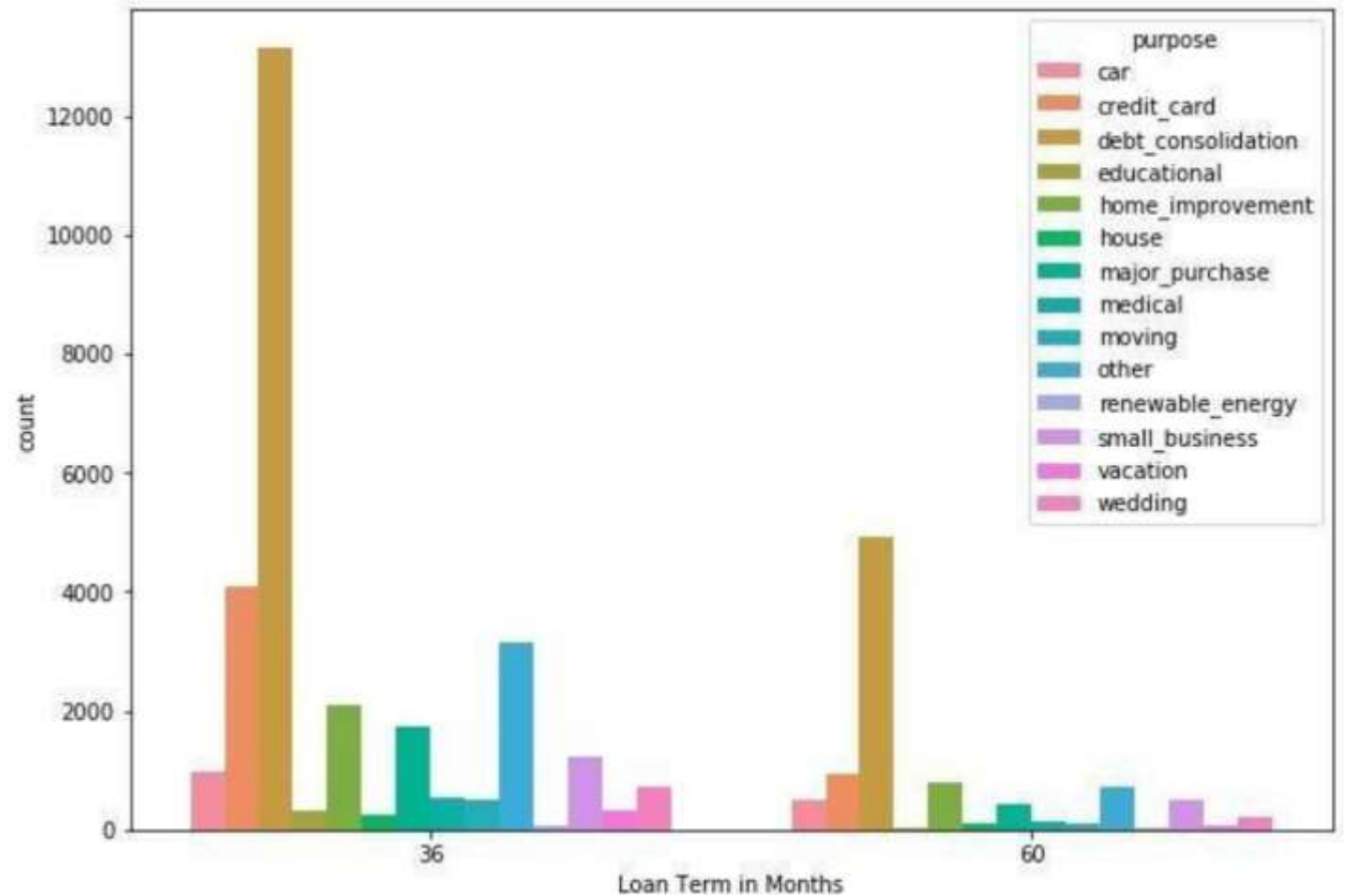
## Observation:

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

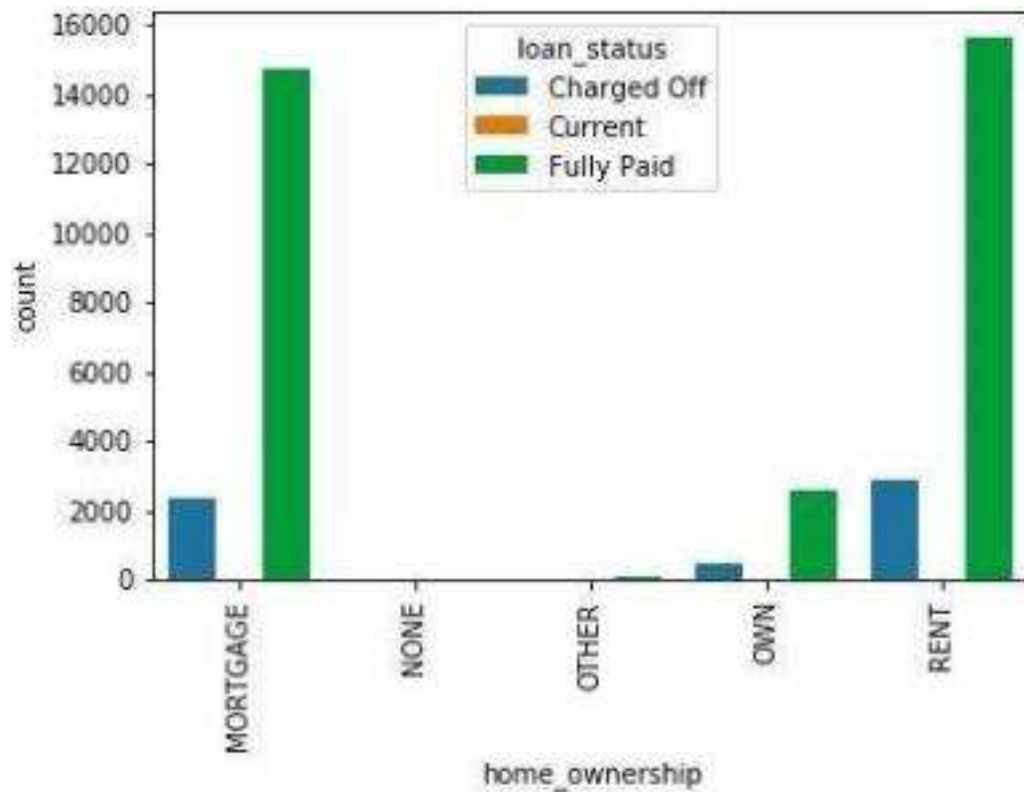


### Observation:

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

## Observations

**The analysis of charged-off loans suggests higher probability of defaulting when:**

- Applicants take loans for 'home improvement' and have an income between 60k and 70k.
- Applicants with 'MORTGAGE' home ownership and an income of 60k-70k.
- Applicants who receive interest rates between 21% and 24% and have an income of 70k-80k.
- Applicants who borrow between 30k and 35k with interest rates between 15% and 17.5%.
- Applicants who borrow for small business and have a loan amount greater than 14k.
- Applicants with 'MORTGAGE' home ownership and a loan amount of 14k-16k.
- Loans graded as 'F' with loan amounts between 15k and 20k.
- Applicants with 10 years of employment and loan amounts between 12k and 14k.
- Verified loans with amounts above 16k.
- Loans graded as 'G' with interest rates above 20%.

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