

# Lending Club Case Study

## Group Members

Harshavardhan Jain

Saumya Gupta

Praveen Sivasankaran

## Problem Statement

### Business Understanding

This is 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. This company is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures. Borrowers can easily access lower interest rate loans through a fast online interface

## Problem Statement

### Risks Involved

- 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

Like most other lending companies, lending loans to 'risky' applicants is the largest source of financial loss (called credit loss). Credit loss is the amount of money lost by the lender when the borrower refuses to pay or runs away with the money owed. In other words, borrowers who default cause the largest amount of loss to the lenders.

## Problem Statement

### Data Understanding

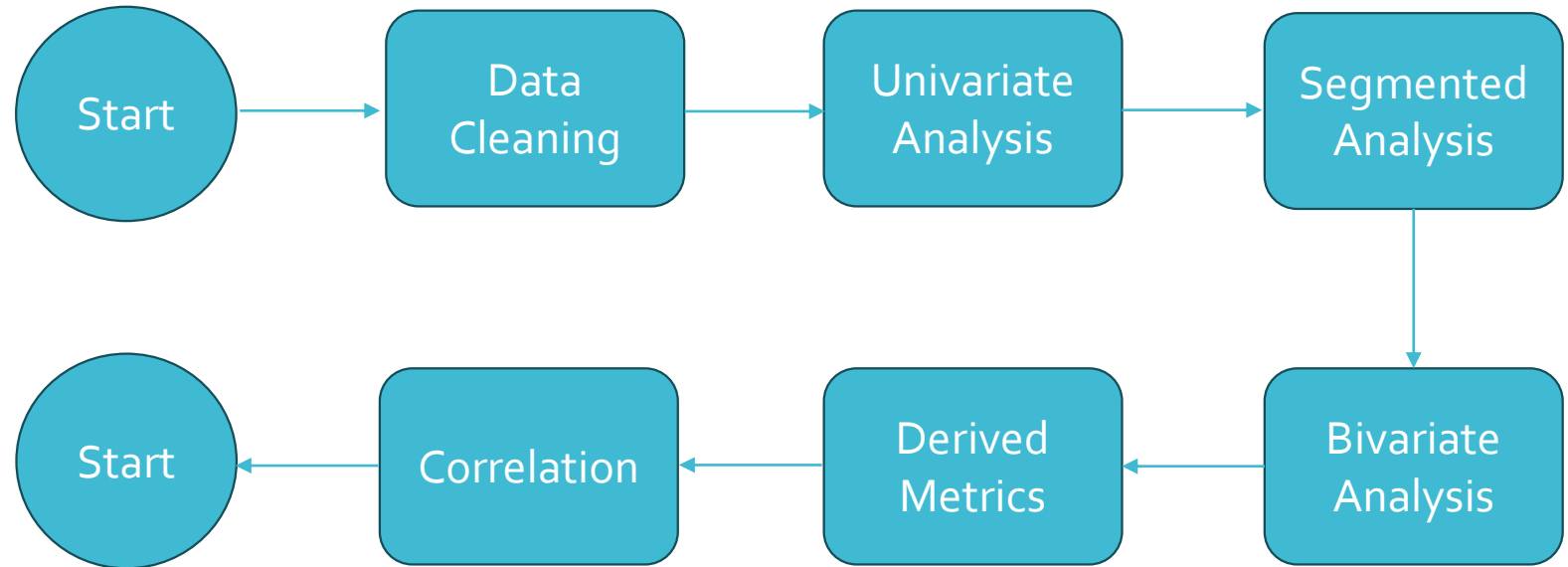
The data given contains information about past loan applicants and whether they 'defaulted' or not. The aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending to risky applicants at a higher interest rate, etc

In this case study, you will use EDA to understand how consumer attributes and loan attributes influence the tendency of default

## GOAL

Identify the risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss. Identification of such applicant's using EDA is the aim of this case study

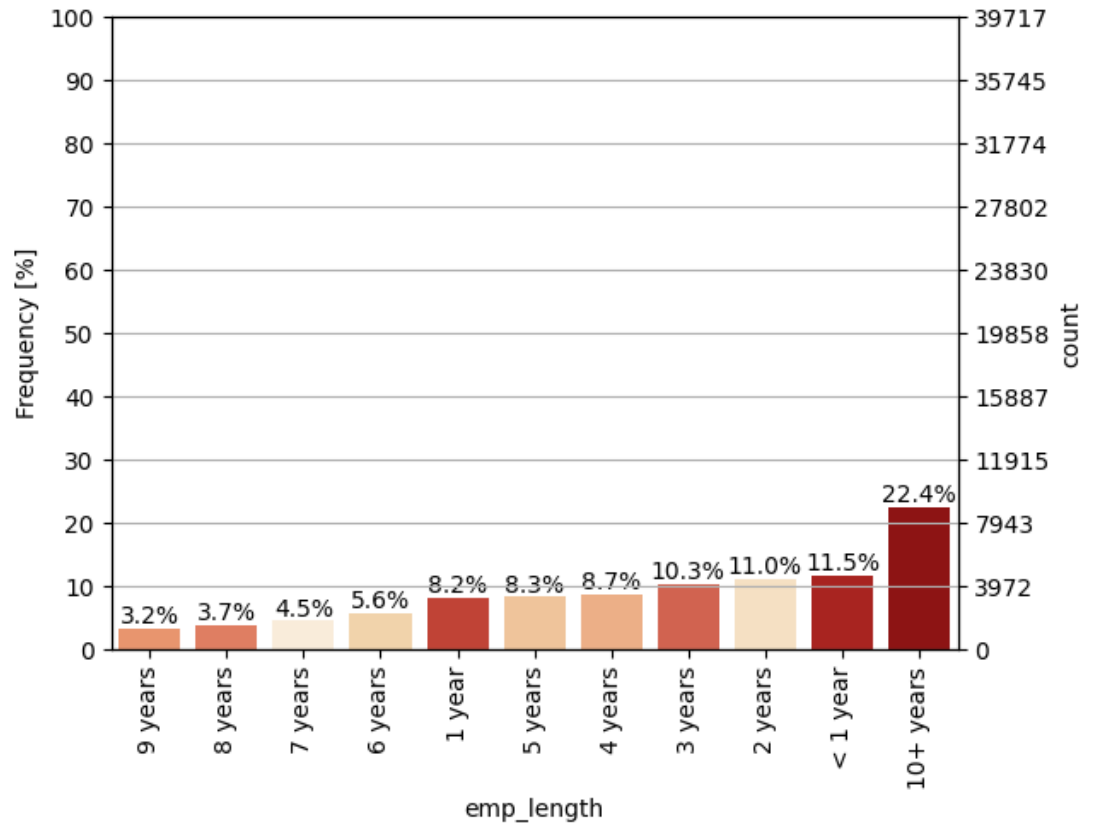
## Analysis Approach



## Univariate Analysis - Employee Length

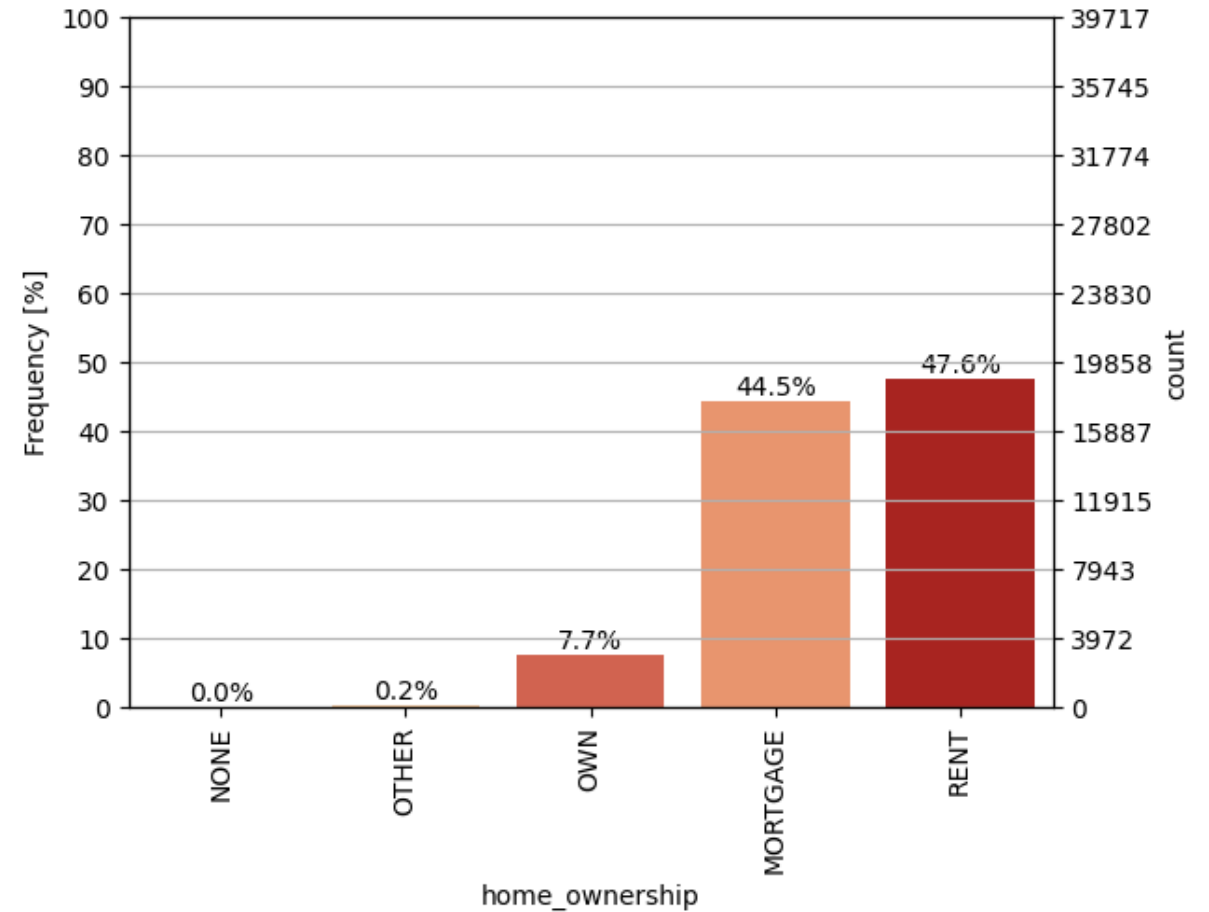
Employees with 10+ years of total experience  
availed maximum number of loans

Employees with 1, 2, 3 years total experience  
availed next maximum number of loans



## Univariate Analysis - Home ownership

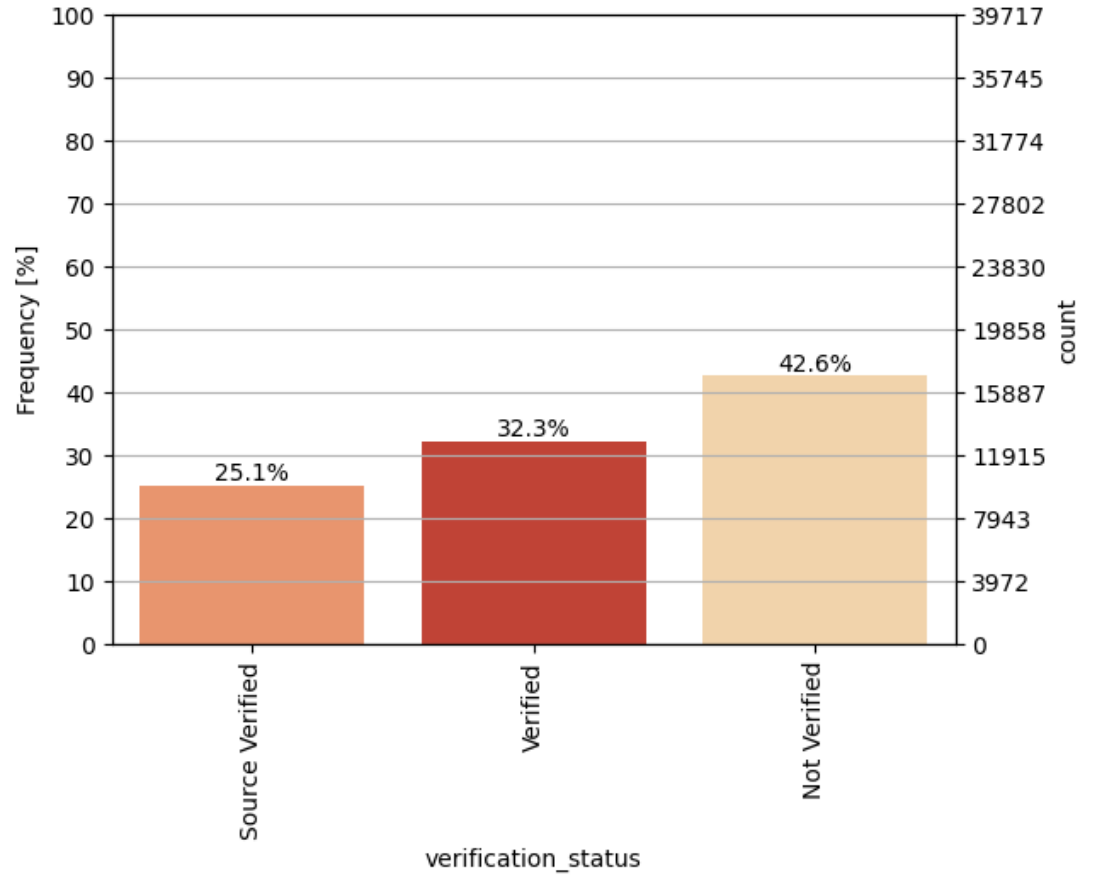
Most loans are taken from people whose house ownership status is either rent or mortgage





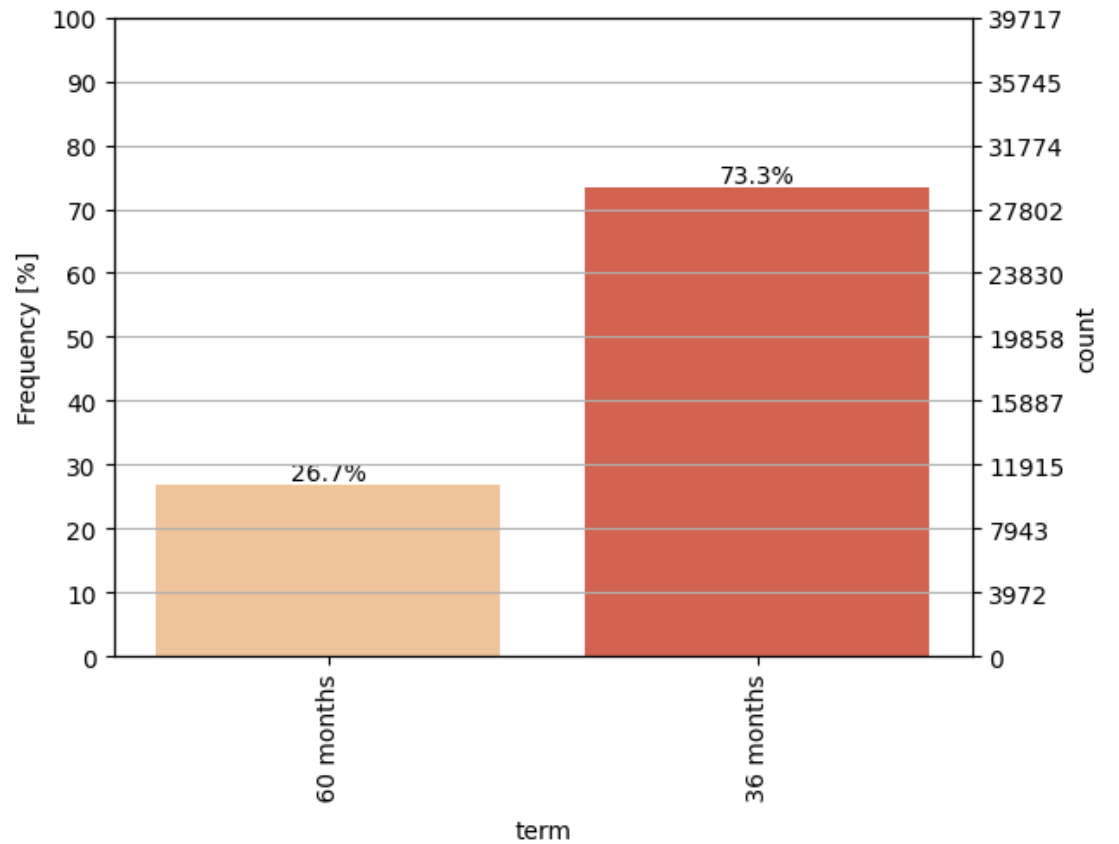
## Univariate Analysis - Verification Status

Higher number of loans are taken from non verified sources



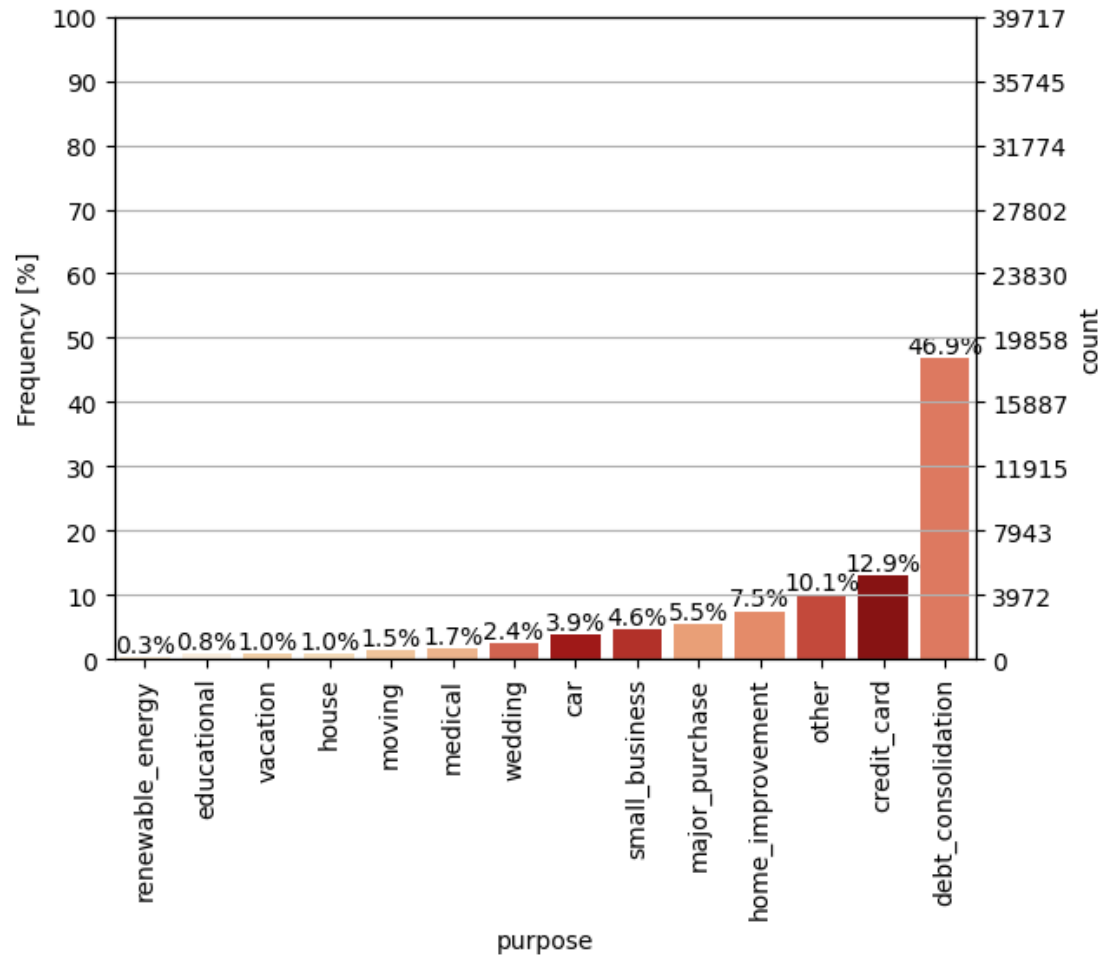
## Univariate Analysis - Verification Status

Number of 36 months loan are higher than 60 months loan



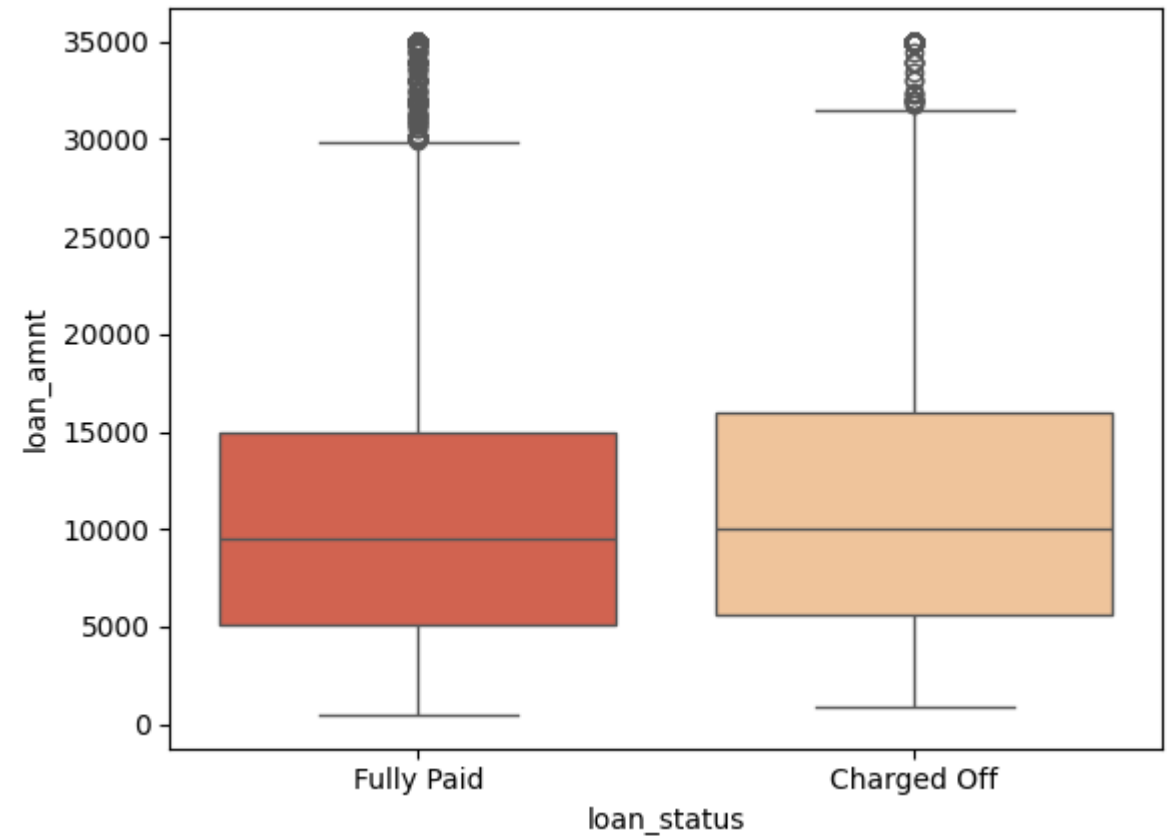
## Univariate Analysis - Purpose

Significantly higher number of loans are taken for debt consolidation purpose



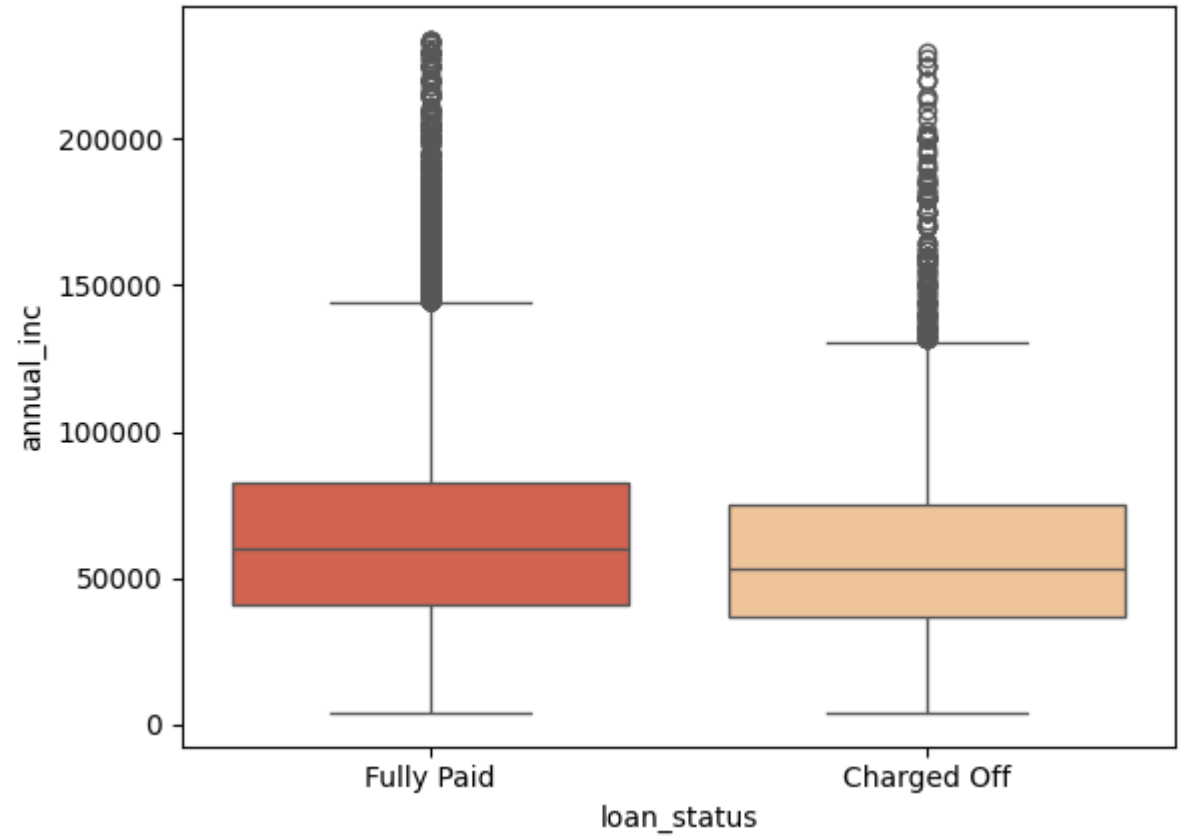
## Segmented Analysis - Loan Status, Loan amount

There is no significant difference for loan amount vs loan status, but the number of Charged Off people are in the bucket of 5000 till 16000.



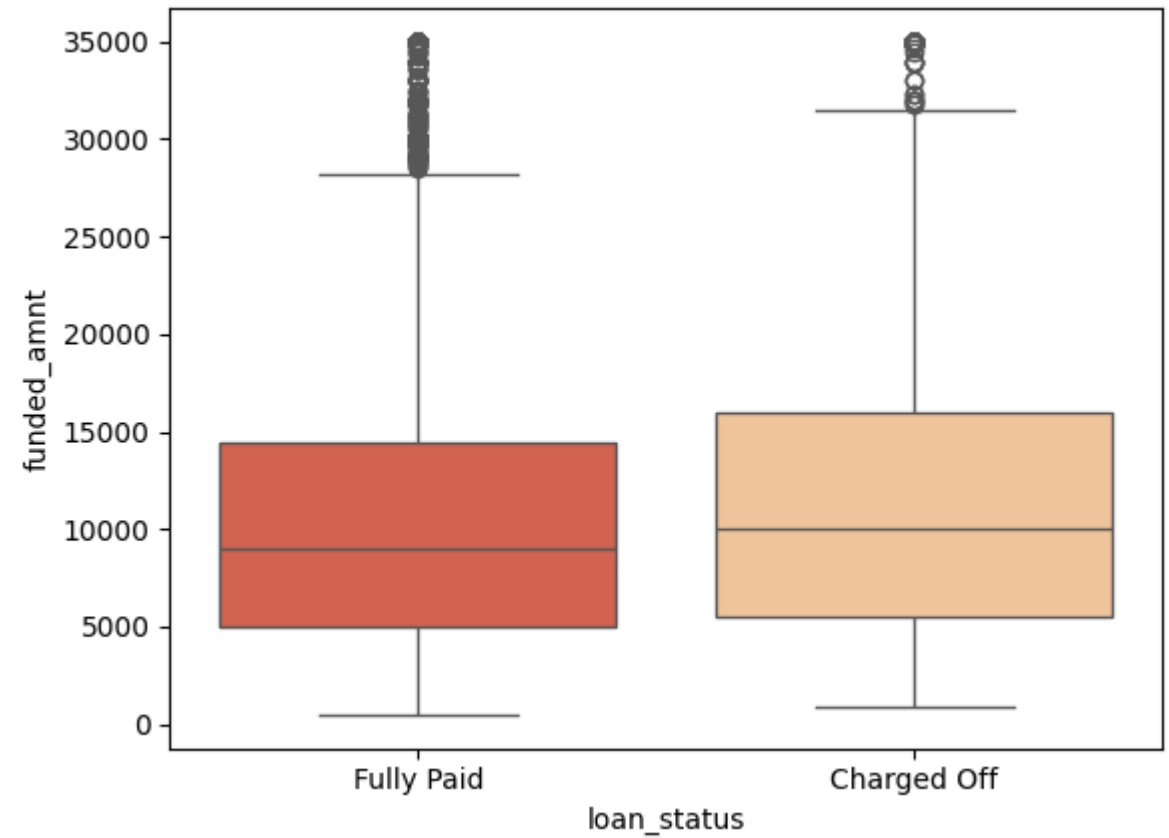
## Segmented Analysis - Loan Status, Annual Income

People in higher annual income range have lesser chances of Charged off than Fully Paid



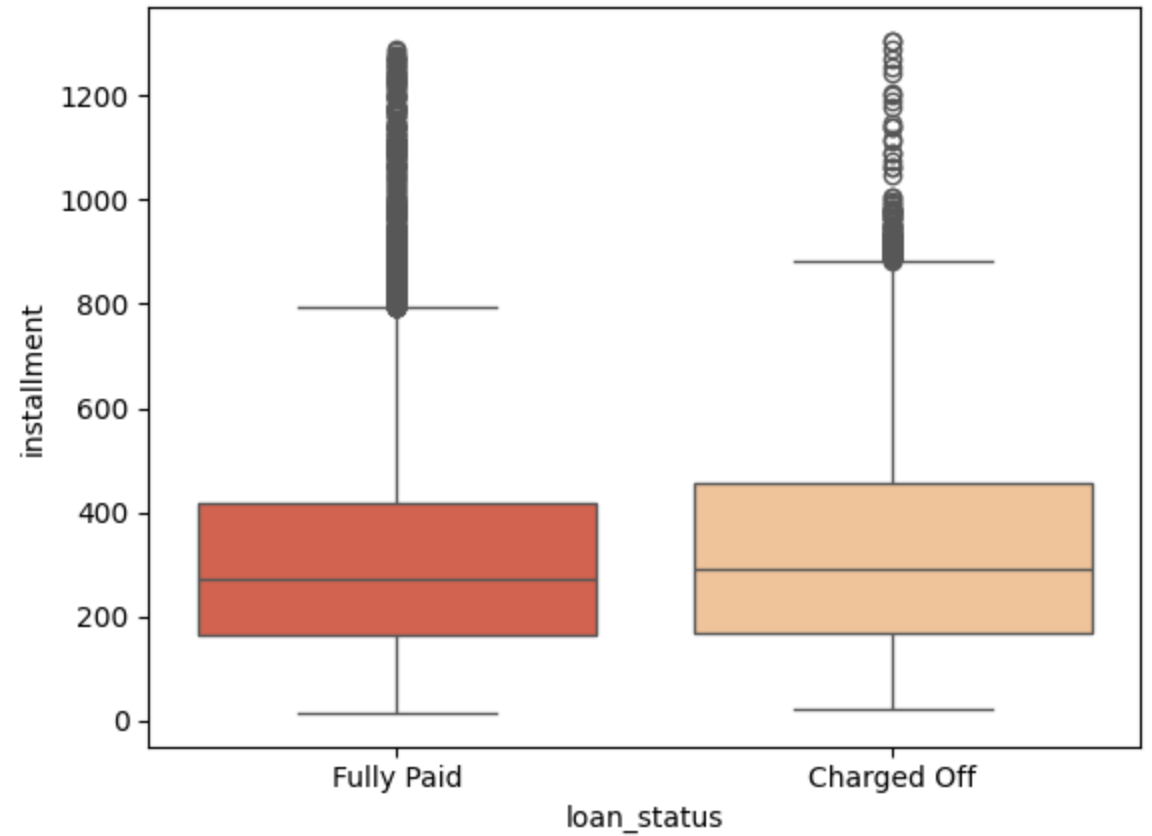
## Segmented Analysis - Loan Status, Funded Amount

People in higher funded amount have more chances of Charged off than Fully Paid



## Segmented Analysis - Loan Status, Installment

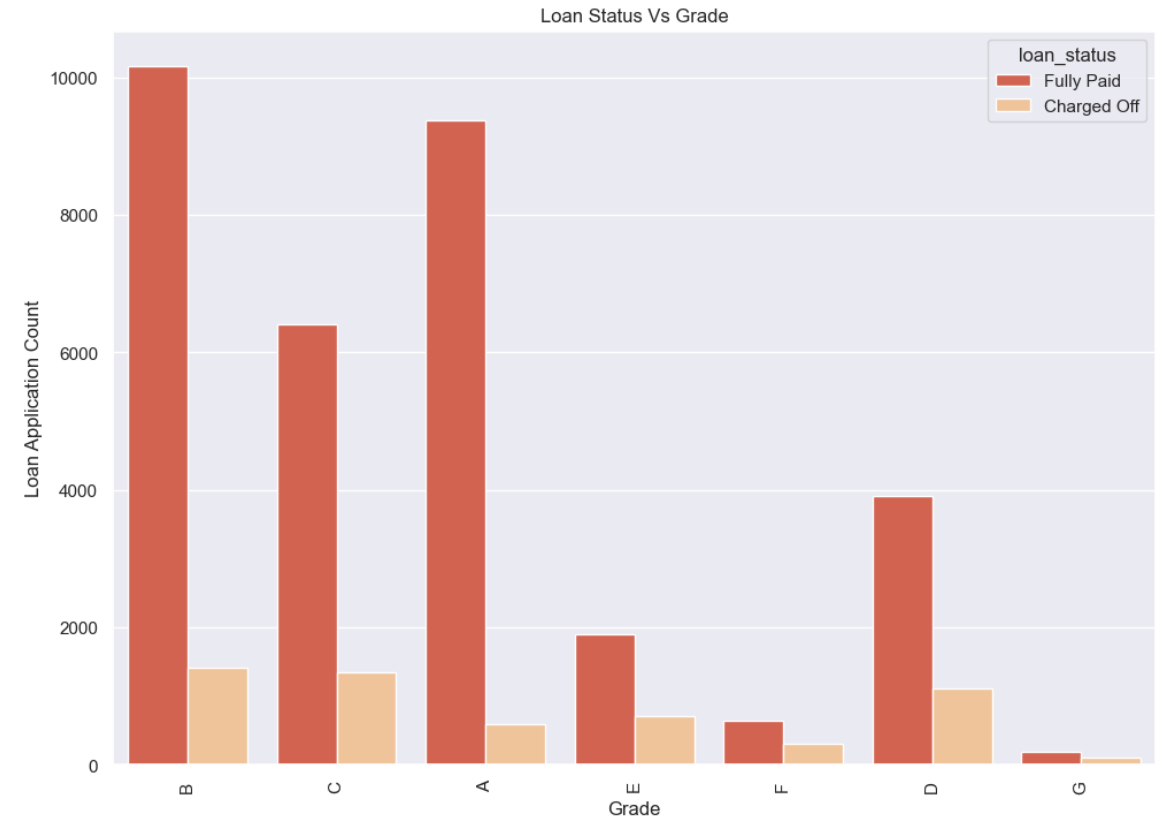
People having installment more than 400 have more chances of Charged off than FullyPaid



## Bivariate Analysis - Loan Application

### Count vs Grade

People in grade B and C are having more chances of charged off

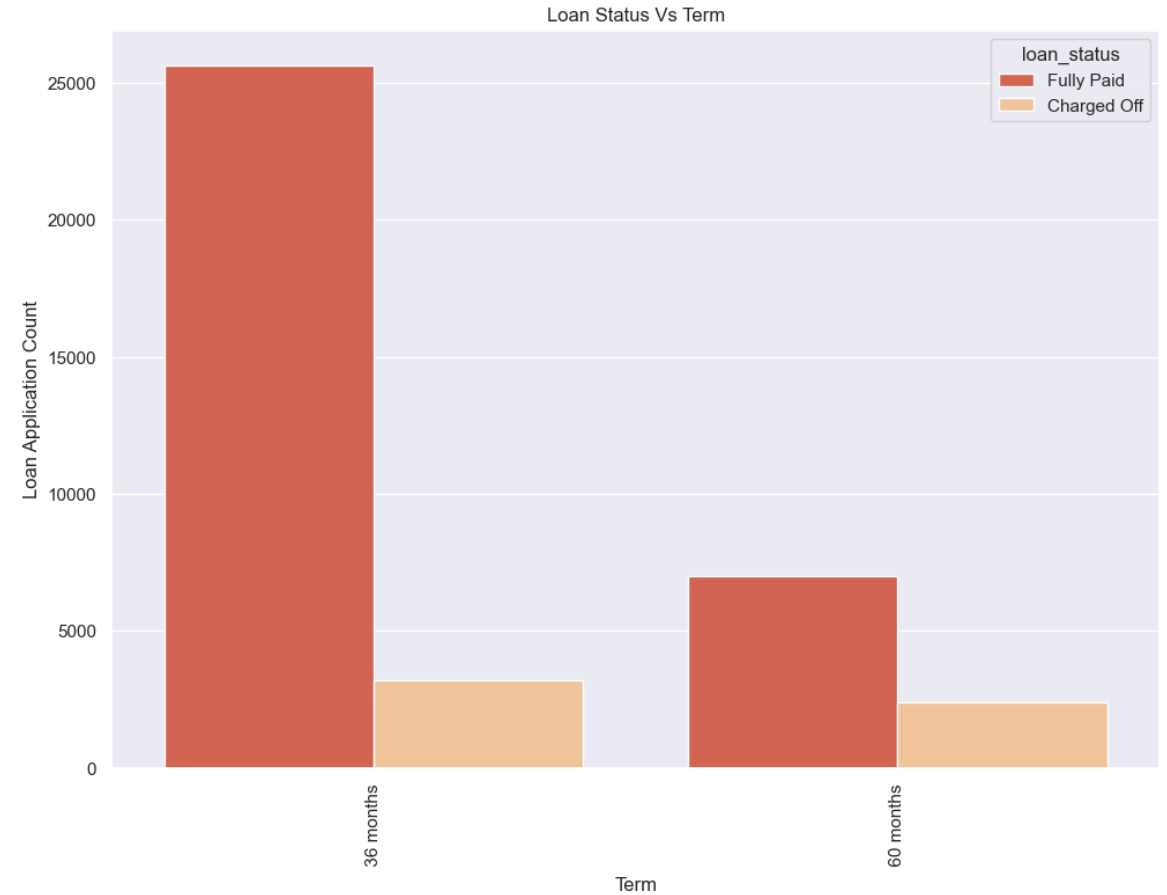




## Bivariate Analysis - Loan Application

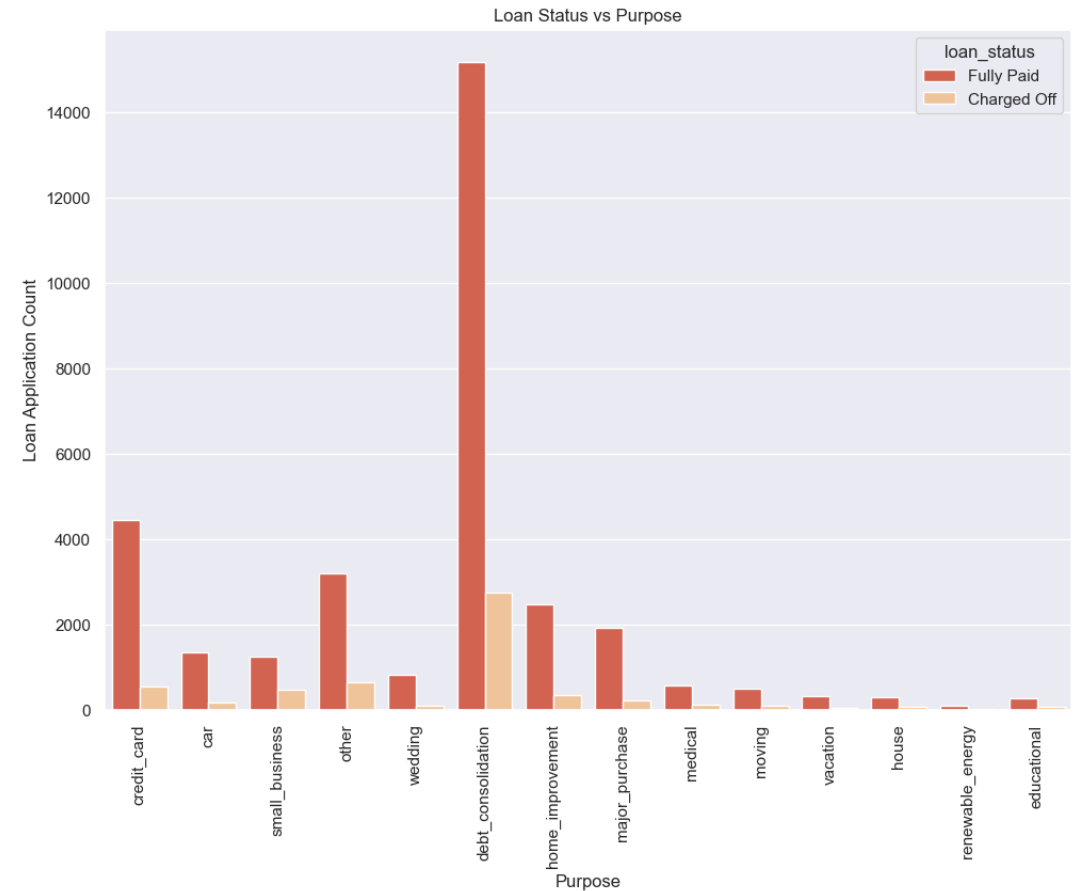
### Count vs Term

People in 36 months load tenure have more chances of charged off



## Bivariate Analysis - Loan Application Count vs Purpose

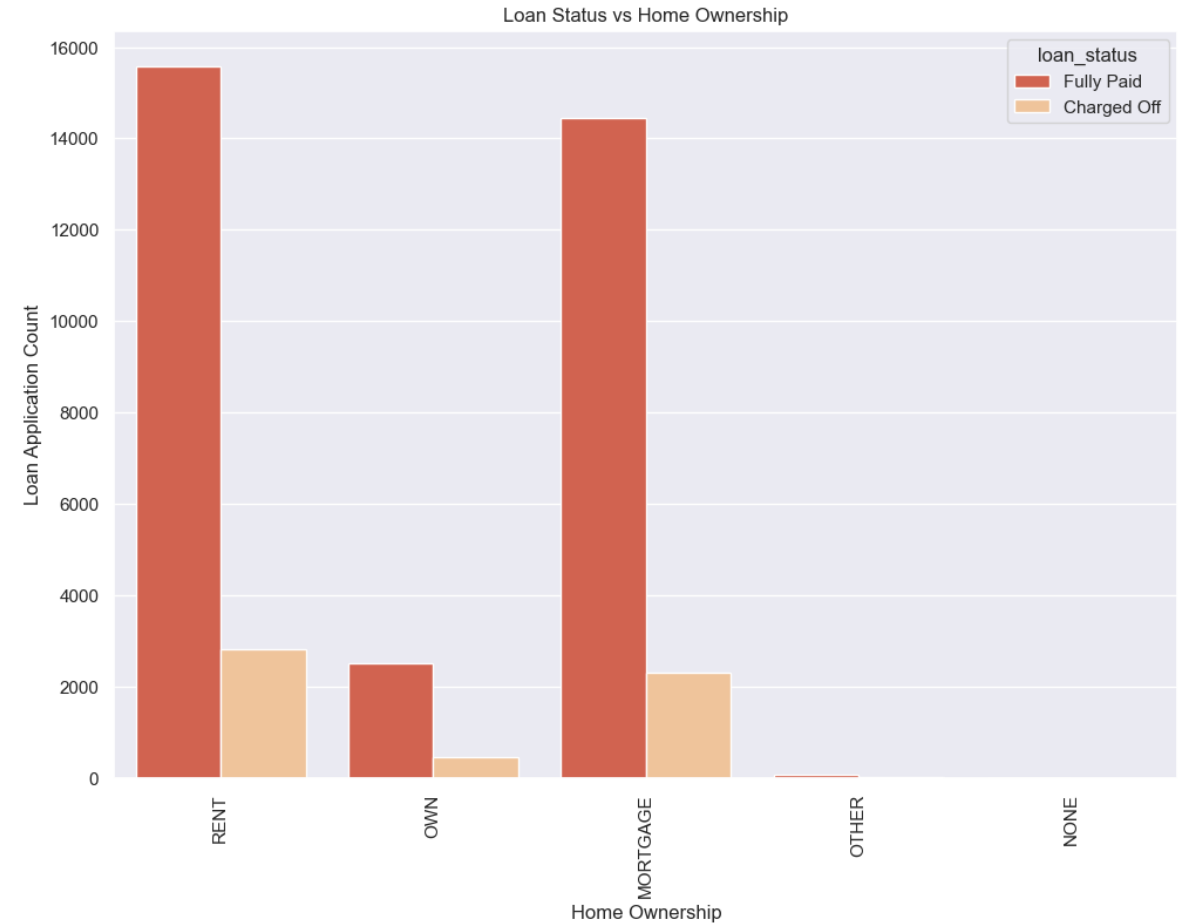
People having higher tendency of being charged off, if the loan purpose is debt consolidation, other categories, small business and credit card



## Bivariate Analysis - Loan Application

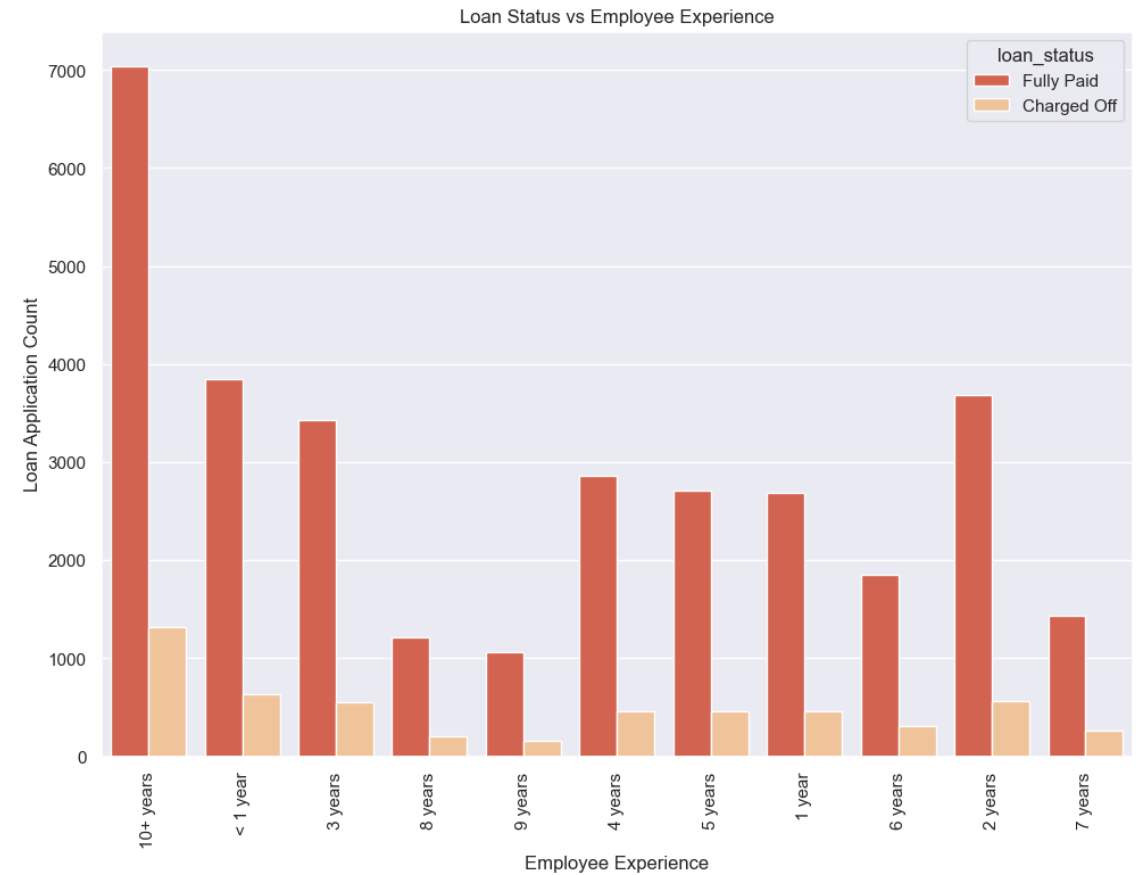
### Count vs Home Ownership

People having higher tendency for doing charged off, if their home ownership is rented or mortgage



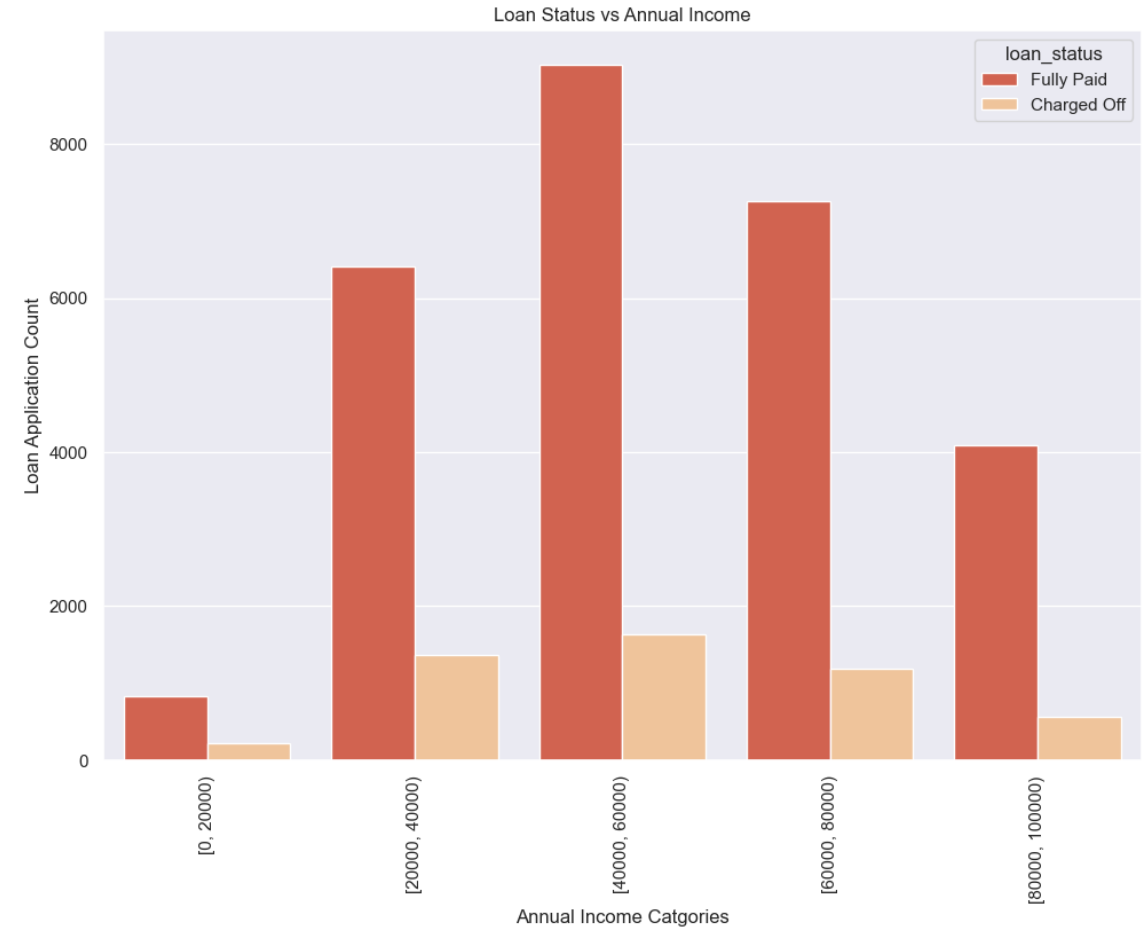
## Bivariate Analysis - Loan Application Count vs Employee Experience

People belongs to experience group of 1 to 3 years and more than 10+ years are having more chances of Charged off



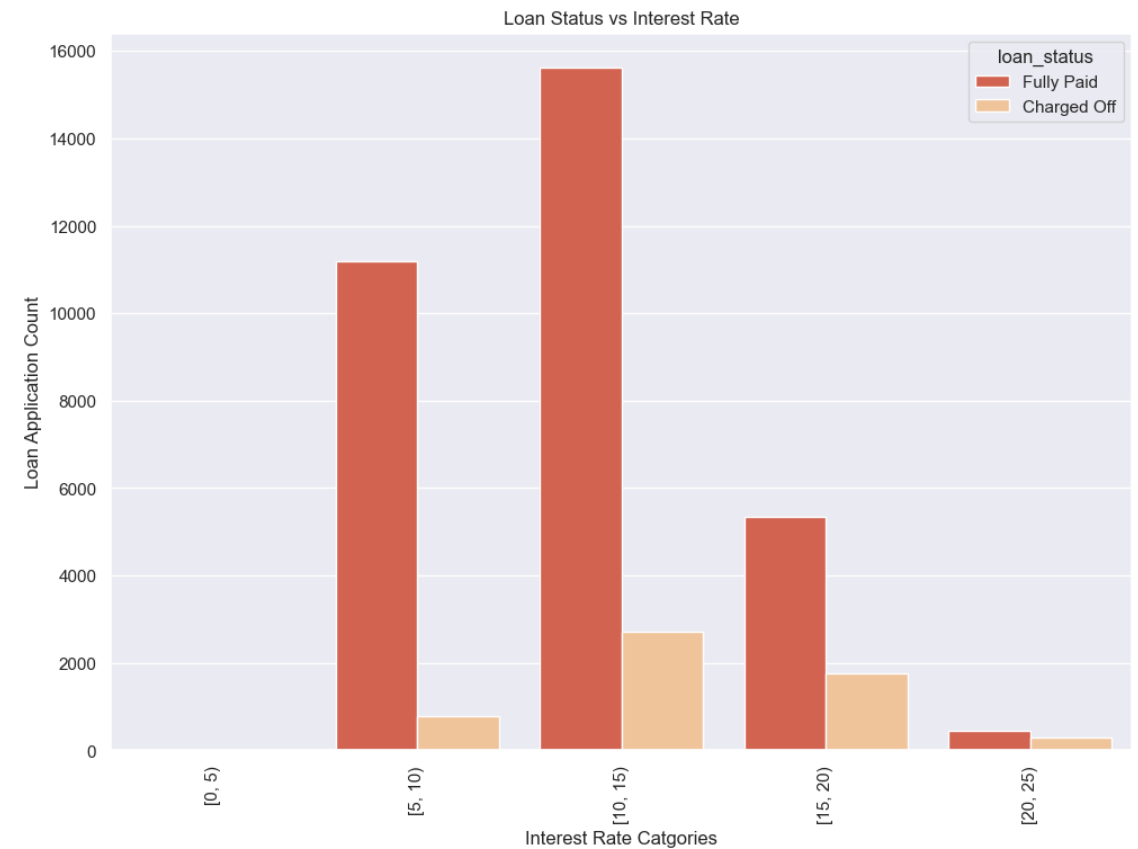
## Derived Metrics – Annual Income categories

People with annual income in the range of 20000 to 60000 are having more chances of Charged Off



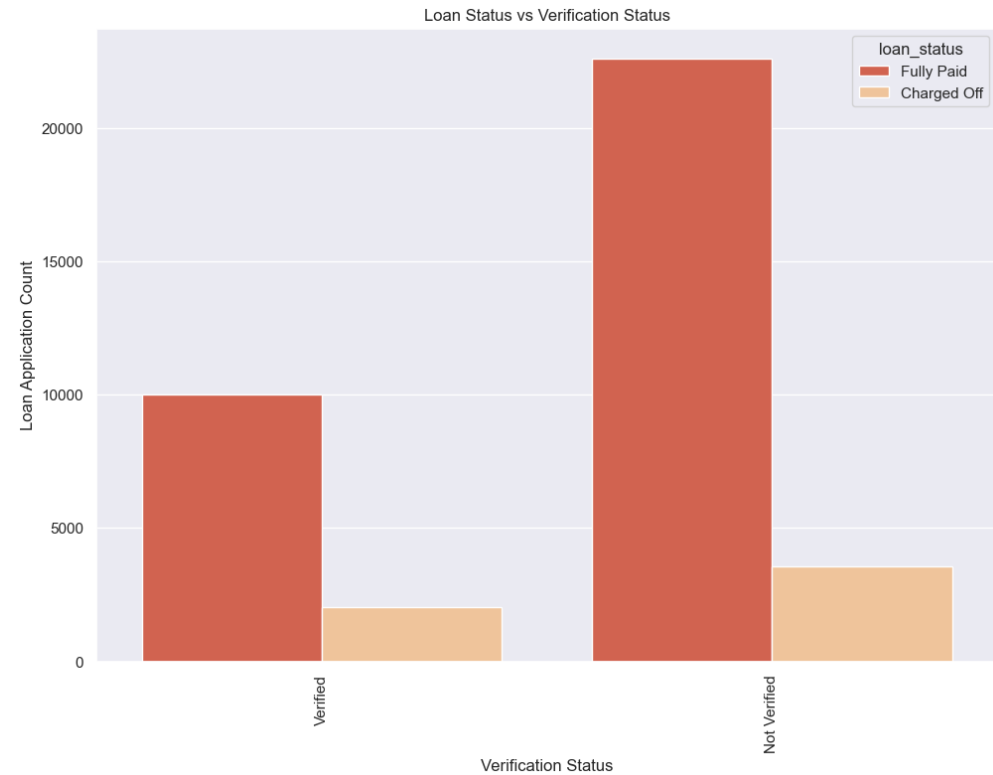
## Derived Metrics - Interest rate ranges

People availed loan with interest range between 10 to 15 are having more chances of Charged Off



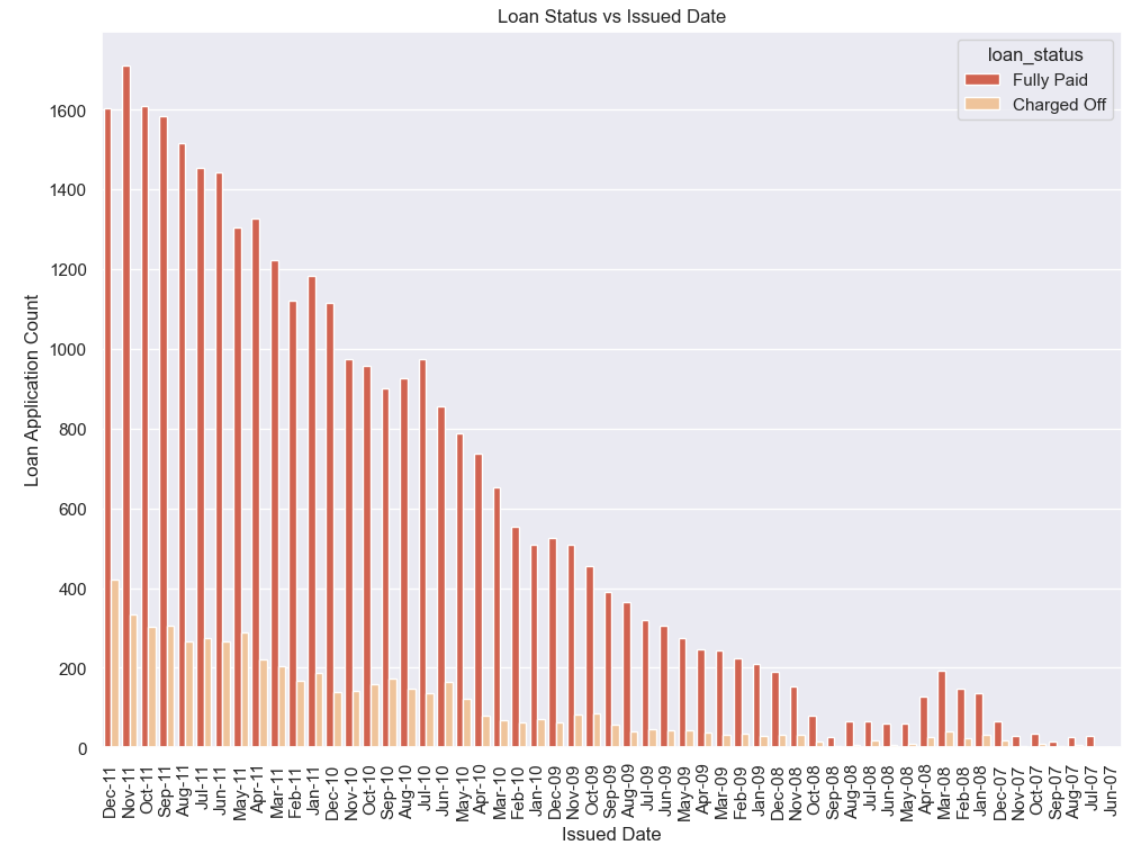
## Derived Metrics - Verification Status

People with no verification status are more prone to be Charged off, and hence we need to ensure proper verification for people before allocating the loan



## Bivariate Analysis – Issued Date

Charged off chances are higher for people in the last month of every year. Reason could be Holidays or any sort of Crisis or more expenses due to vacation plans



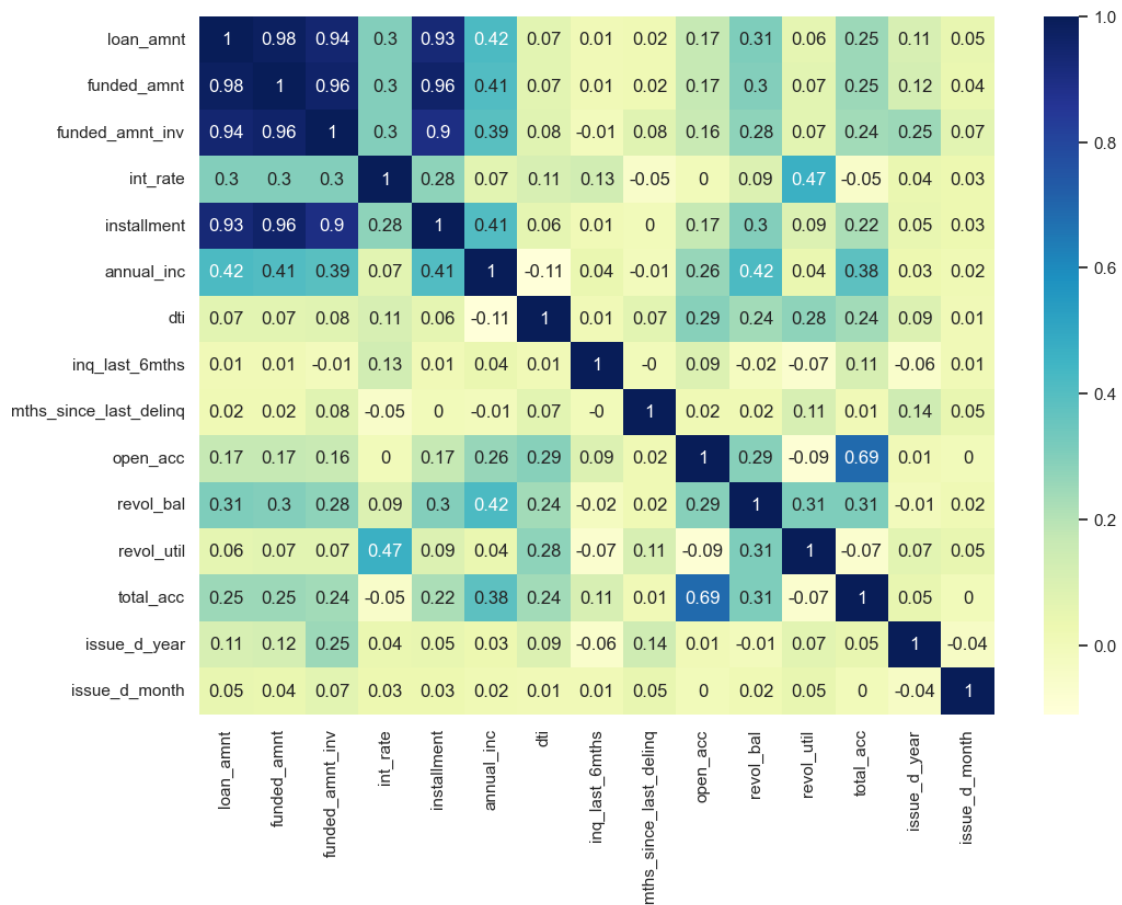


## Correlation

The loan amount, funded amount and funded amount inv are positively correlated

DTI ratio is negatively correlated with annual income, which means higher the annual income lower is the DTI ratio

If Installment is higher, then the loan amount is also higher and interest rate is similar in both the factors



## Conclusion

### Univariate Analysis

- Number of 36 months loan are higher than 60 months loan
- Employees with 10+ years of total experience availed maximum number of loans
- Significantly higher number of loans are taken for debt consolidation purpose
- Most loans are taken from people whose house ownership status is either rent or mortgage
- Higher number of loans are taken from non verified sources
- Loan issuance are increasing from July 07 to December 11
- CA state has maximum loan applications

## Conclusion

### Segmented Univariate Analysis

- There is no significant difference for loan amount vs loan status, but the number of Charged Off people are in the bucket of 5000 till 16000
- People in higher annual income range have lesser chances of Charged off than Fully Paid
- People in higher funded amount have more chances of Charged off than Fully Paid

## Conclusion

### Bivariate Analysis

- People in grade B and C are having more chances of charged off
- People in 36 months load tenure have more chances of charged off
- People having higher tendency of being charged off, if the loan purpose is debit consolidation, other categories, small business and credit card
- People having higher tendency for doing charged off, if their home ownership is rented or mortgage
- People belongs to experience group of 1 to 3 years and more than 10+ years are having more chances of Charged off
- 60 months loan term see significantly large percentage of defaulters
- People with annual income in the range of 20000 to 60000 are having more chances of Charged Off

## Conclusion

### Bivariate Analysis

- People availed loan with interest range between 10 to 15 are having more chances of Charged Off
- People with no verification status are more prone to be Charged off, and hence we need to ensure proper verification for people before allocating the loan
- Charged off chances are higher for people in the last month of every year. Reason could be Holidays or any sort of Crisis or more expenses due to vacation plans

## Conclusion

### Correlation

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- DTI ratio is negatively correlated with annual income, which means higher the annual income lower is the DTI ratio
- If Installment is higher, then the loan amount is also higher and interest rate is similar in both the factors