

Lending Case Study

By Rakesh Rajan (rakesh_rajan@outlook.com)

Stages:

- Imported Libraries
- Loaded datasets
- Data Cleaning
- Univariate Analysis
- Bi-variate Analysis
- Developed Insights

Imported Libraries

- Python - version 3.8.3
- Numpy - version 1.18.5
- Pandas - version 1.0.5
- Seaborn - version 0.11.0
- Matplotlib - version 3.2.2

Loaded datasets

- Loan.csv (Load Data)
- Data_Dictionary.csv (Column Definitions)

Data Cleaning

The following values are removed.

1. Columns with null value
2. Rows with null value
3. Columns which are not defined in the column definitions

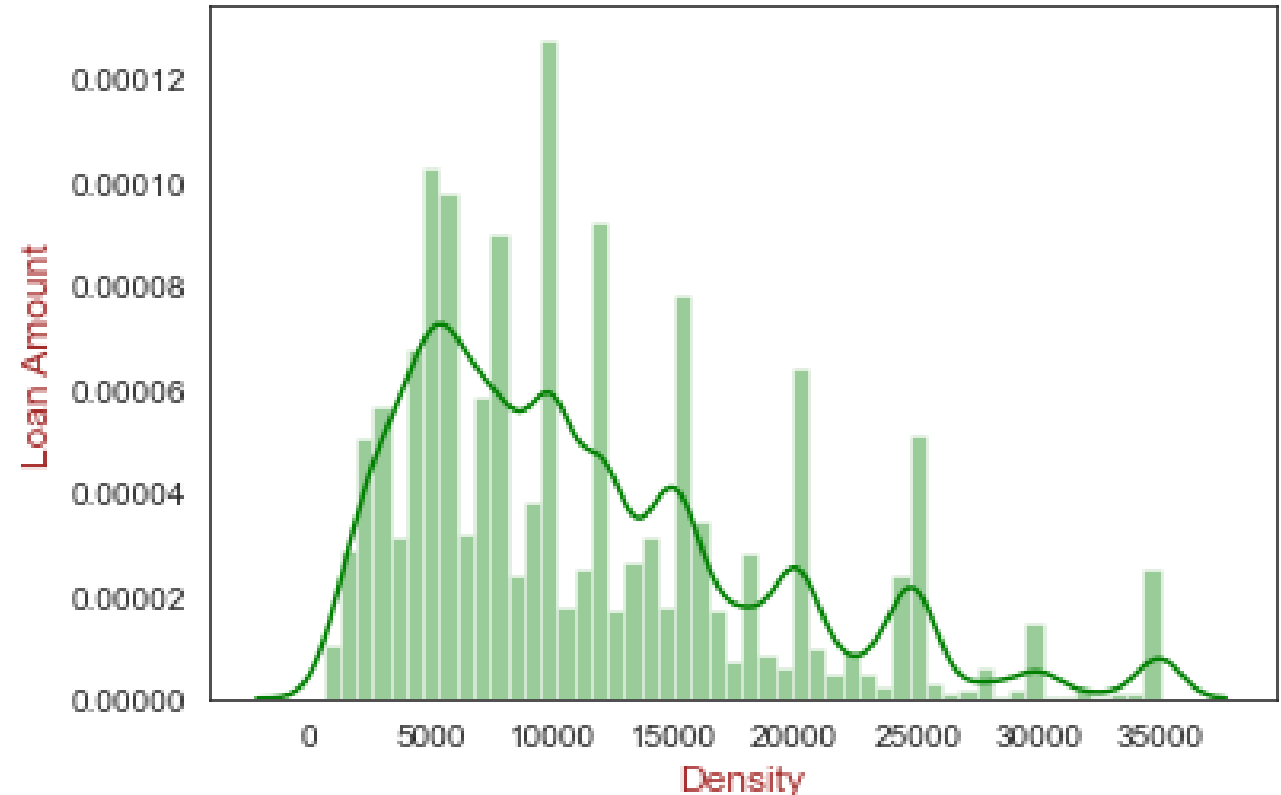
Univariate Analysis (9)

- Distribution of Loan Amount
- Percentage of Approved Amount
- Loan Status
- Loan Term
- Distribution of Interest Rates
- Distribution of Monthly Instalments Money
- Employment Length
- Home Ownership Data
- Distribution of Loan taken by States

Distribution of Loan Amount

- Loan Applied lies between 500 -35000 Loan Amount
- More of the Amount asked by the borrowers are 5000 & 10000.
- Most of the borrowers need Amount less than 15000.

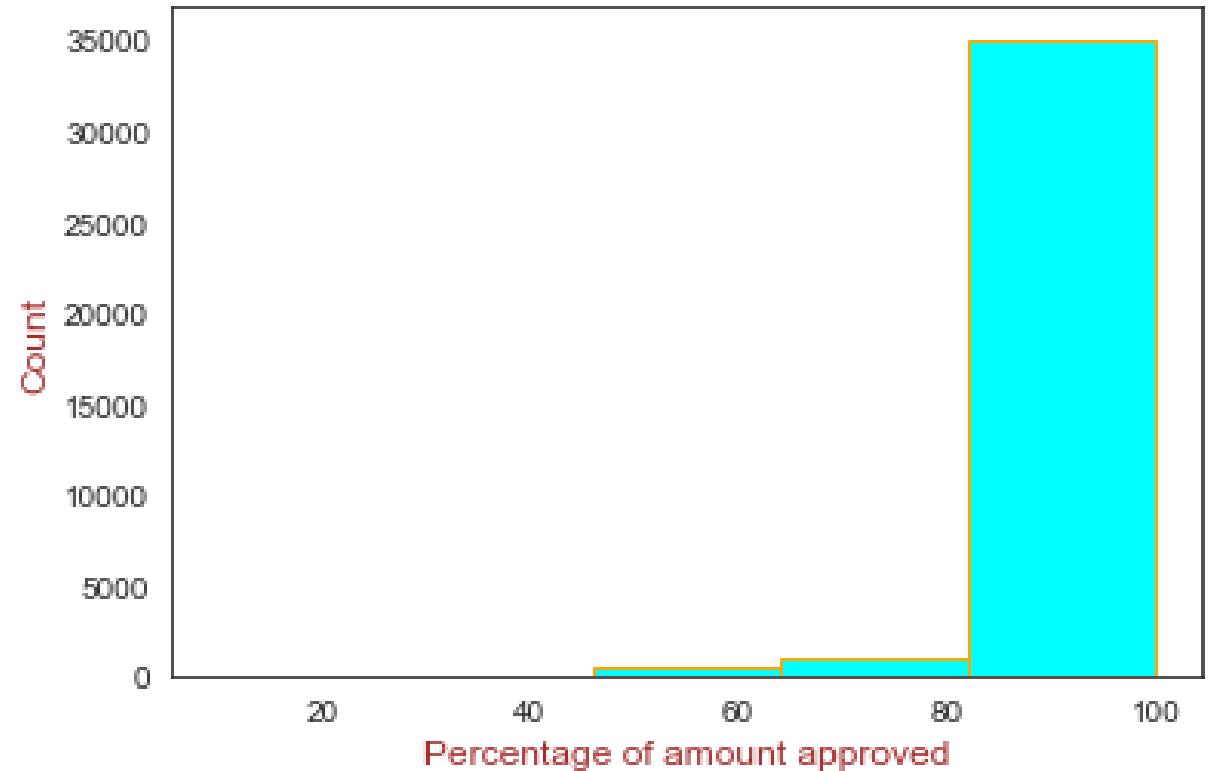
Distribution of loan amount



Percentage of Approved Amount

Most of the people 's amount
is Approved.

Ratio of loan approved amount



Loan Status

- In about 129 records, Most of the people have paid off the loan amount, So continuing to provide loan is better.
- More people have charged off.

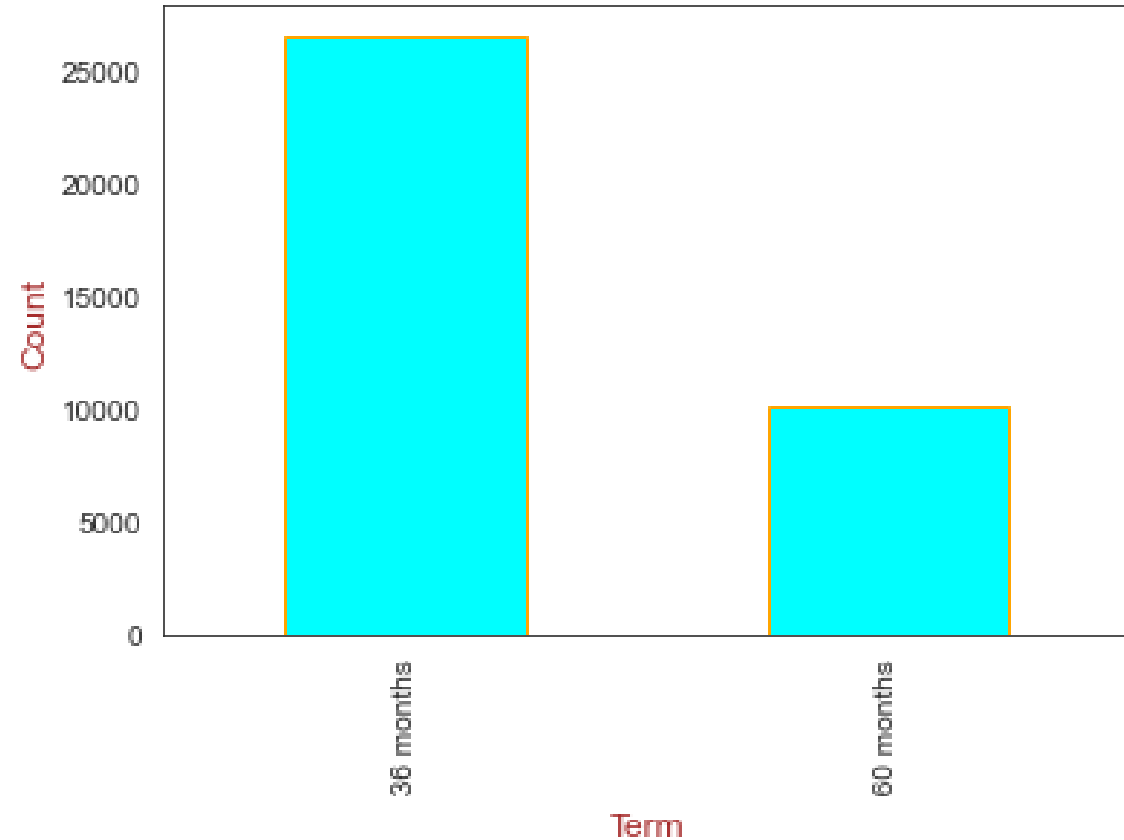
People who were not accepted to fund by investor



Loan Term

- 36 & 60 months are the chosen terms for analysis.
- Most of the people, around more than 25000 people have chosen 36 month tenure, while only 10000 people have chosen 60 month tenure.

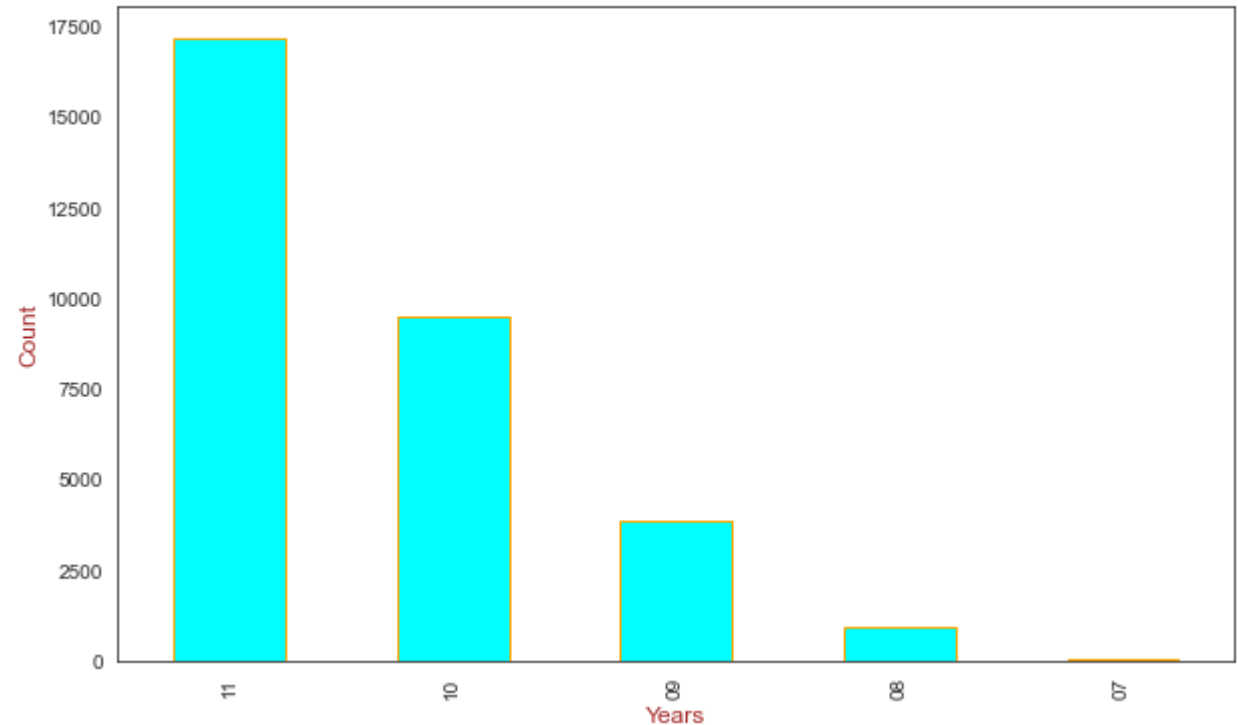
Understanding how people took the terms



Distribution of Interest Rates in a year

- Most of the people have taken loan in 2011 and then after each year, the number of loan borrowers have increased.

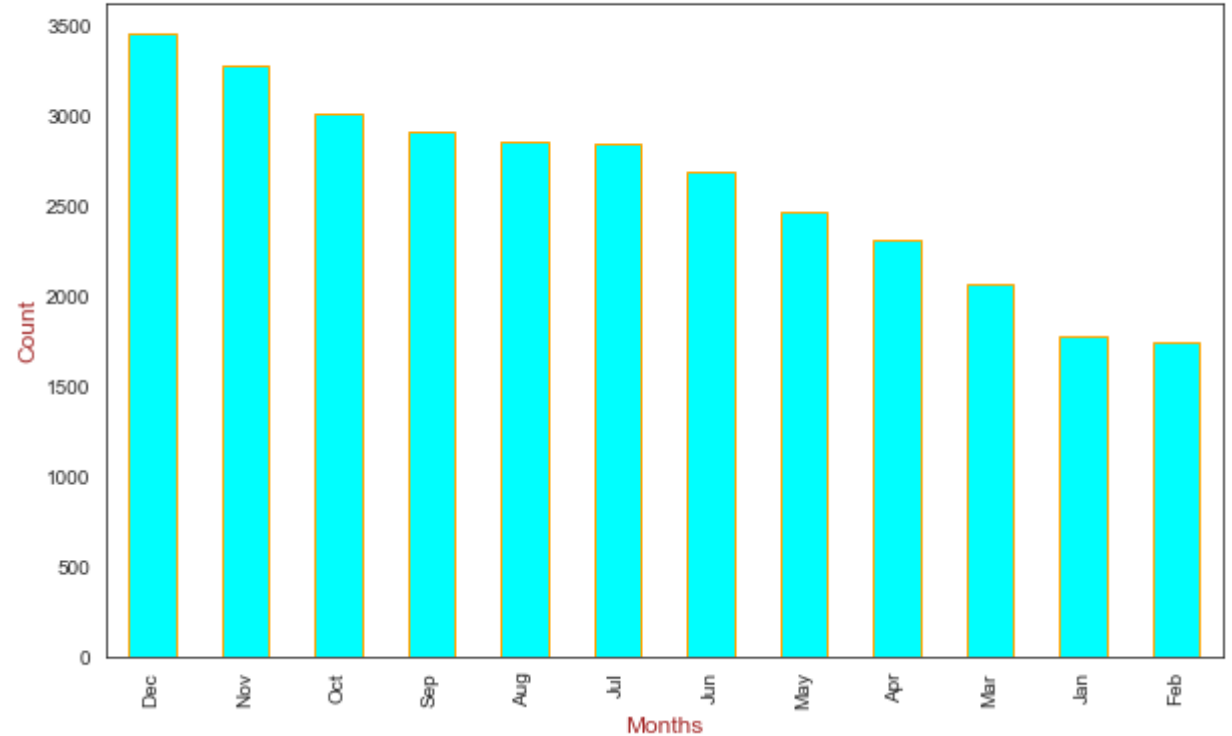
Understanding Distribution of loan taken by Year



Distribution of Monthly Instalments

- Most of the people taken loan in the end of the year.
- There is a need to promote other months mainly in the begging of each year to increase profit.

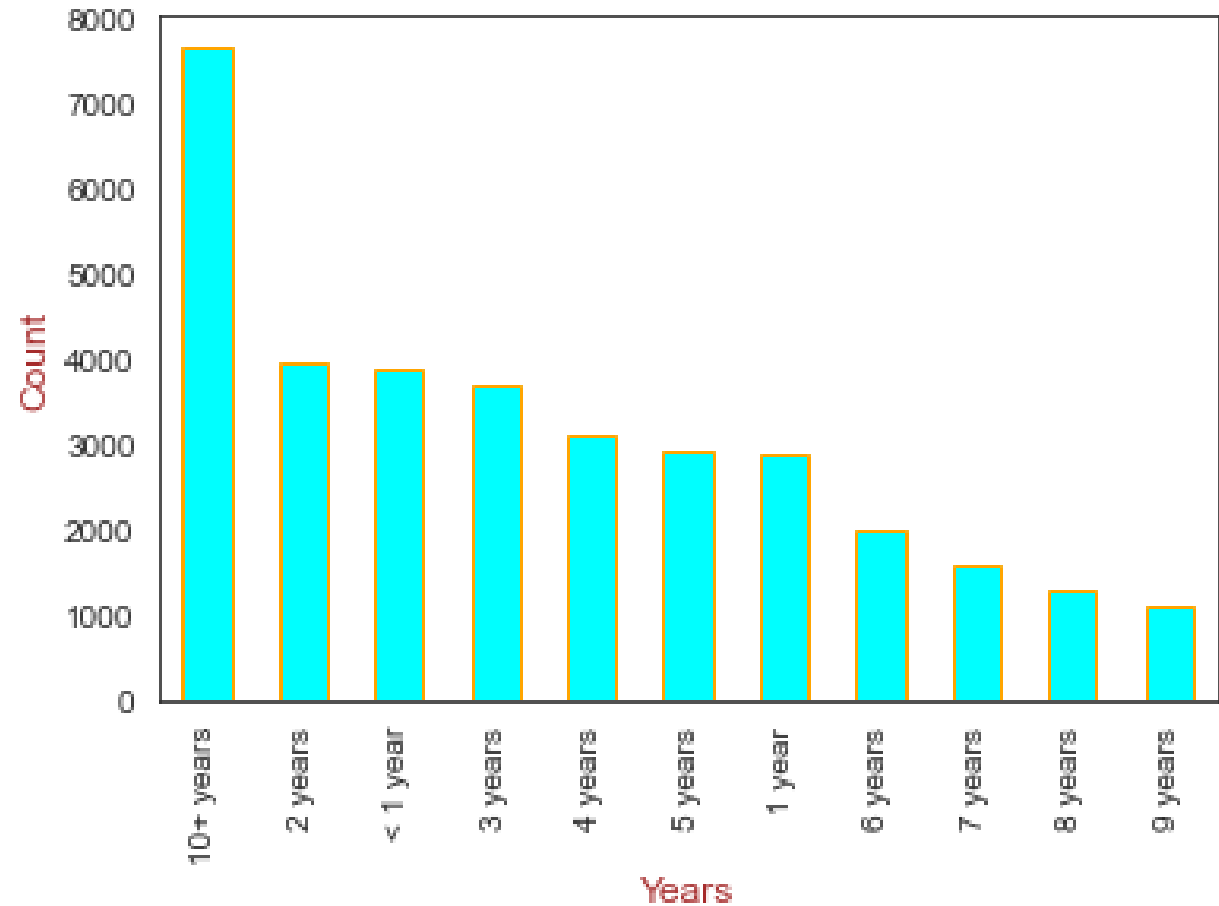
Understanding Distribution of loan taken Monthly



Employment length Data

- People having 10+ years of experience are most of the Loan applicants
- Years of Experience values lies between 0 – 10.

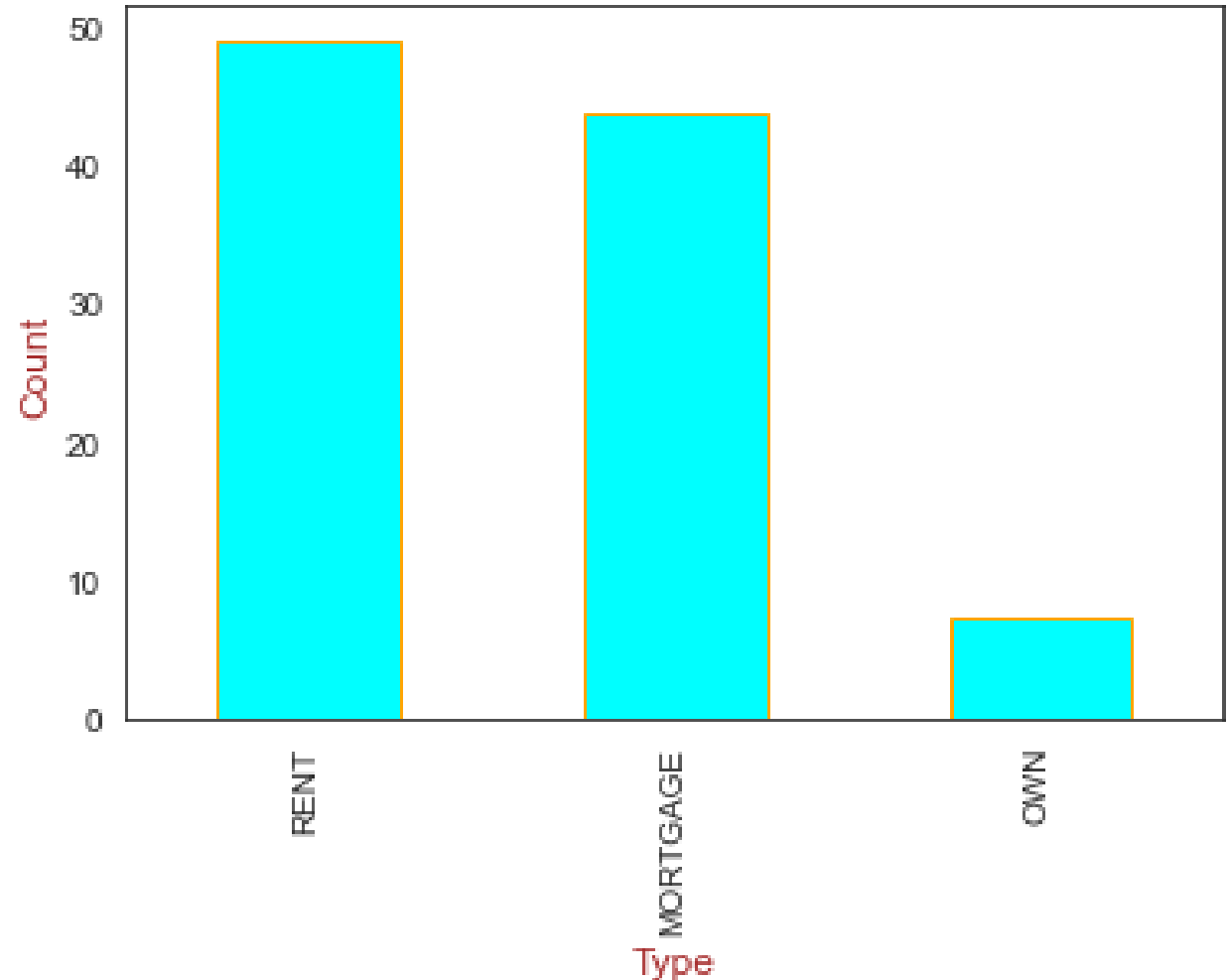
Understanding Employment length Data



Home Ownership Data

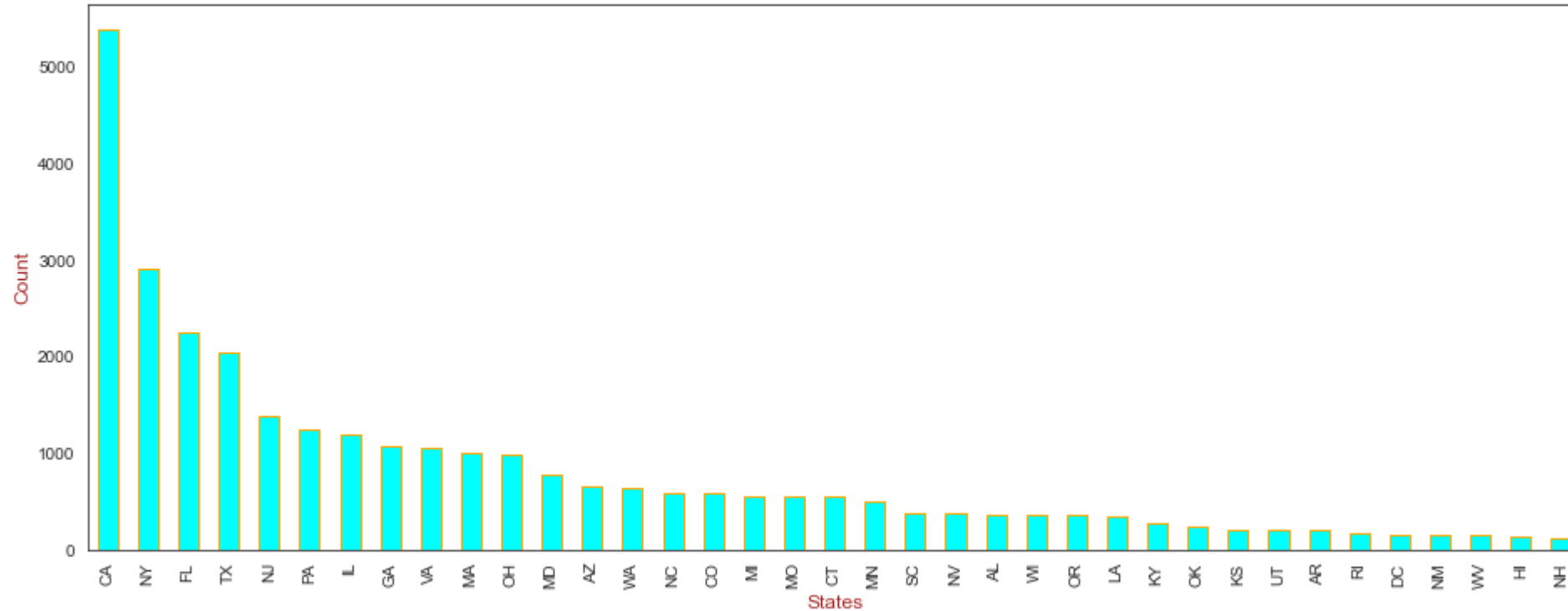
- Most of the people who applied for loan are living either on rent or Mortgage.
- This concludes that around 90% of people does not own a Home.

Understanding Home Ownership Data



Distribution of Loan taken by States

Understanding Distribution of loan taken by States



California State have the highest number of Loans.

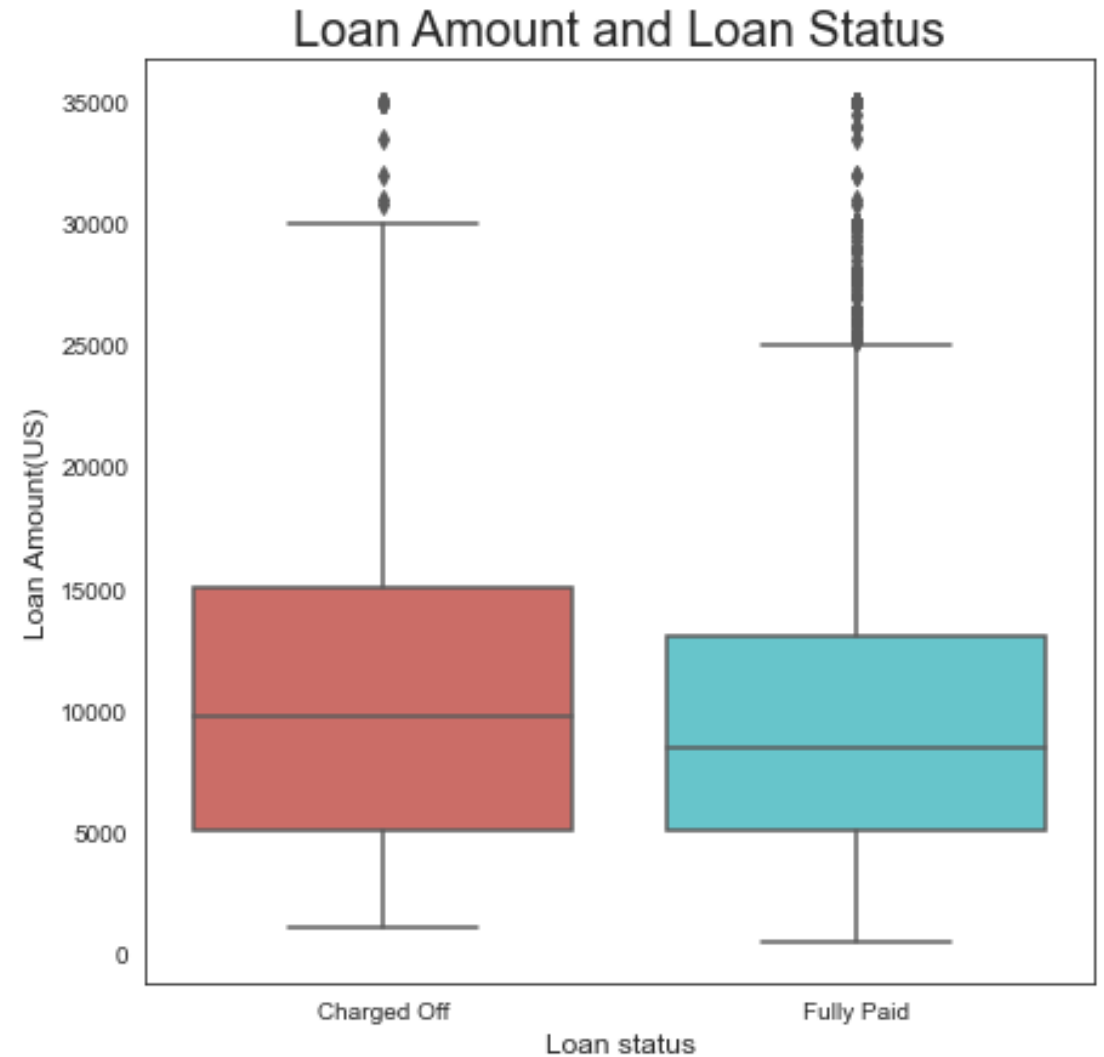
There is a requirement to promote loans to other states as well to increase profits.

Bivariate Analysis (13)

- Loan Amount Vs Loan Status
- Percentage Vs Term
- Interest Rate Vs Loan Status
- Home ownership Vs Loan Status
- Instalment Amount vs Loan Status
- Loan Grades vs Loan Status
- Sub Grades of Loan
- Employment Length vs Loan Status
- Annual Income vs Loan Status
- Purpose vs Loan Status
- Loan Status vs Sub Grades of Loan
- DTI Vs Loan Status
- Percentage of Loans Vs Number of Public Bankrupts

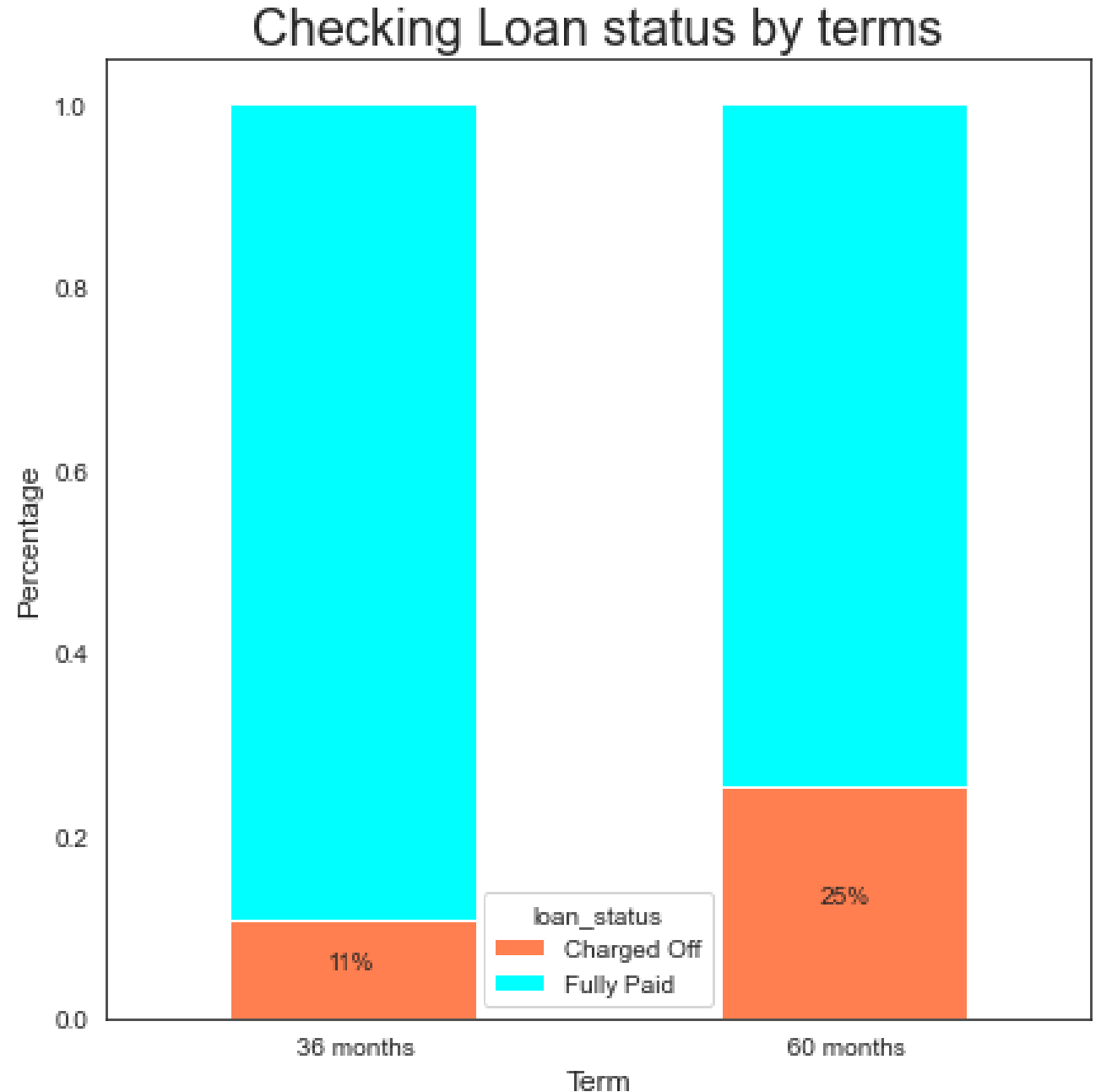
Loan Amount Vs Loan Status

- The interest rate in charged Off is higher than that of Fully Paid, which incurs that higher interest rates results in higher charge Offs.



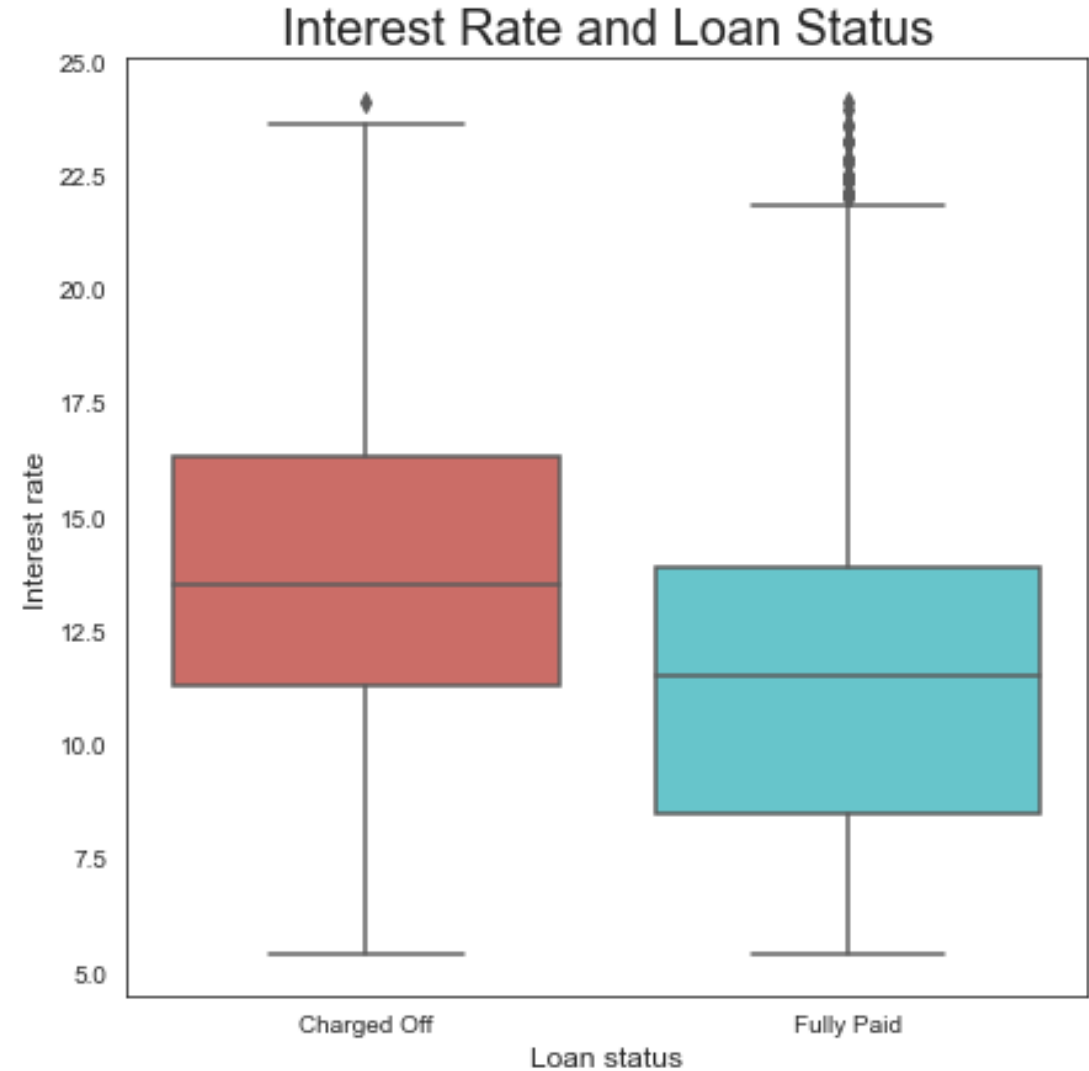
Percentage Vs Term

- The Percentage of Loan not payed off is more in 60 months tenure with about 25% charge off, while It is 11% for 36 month tenure.
- Thus Longer term loans are more risky & prone to higher amount of people not paying off.



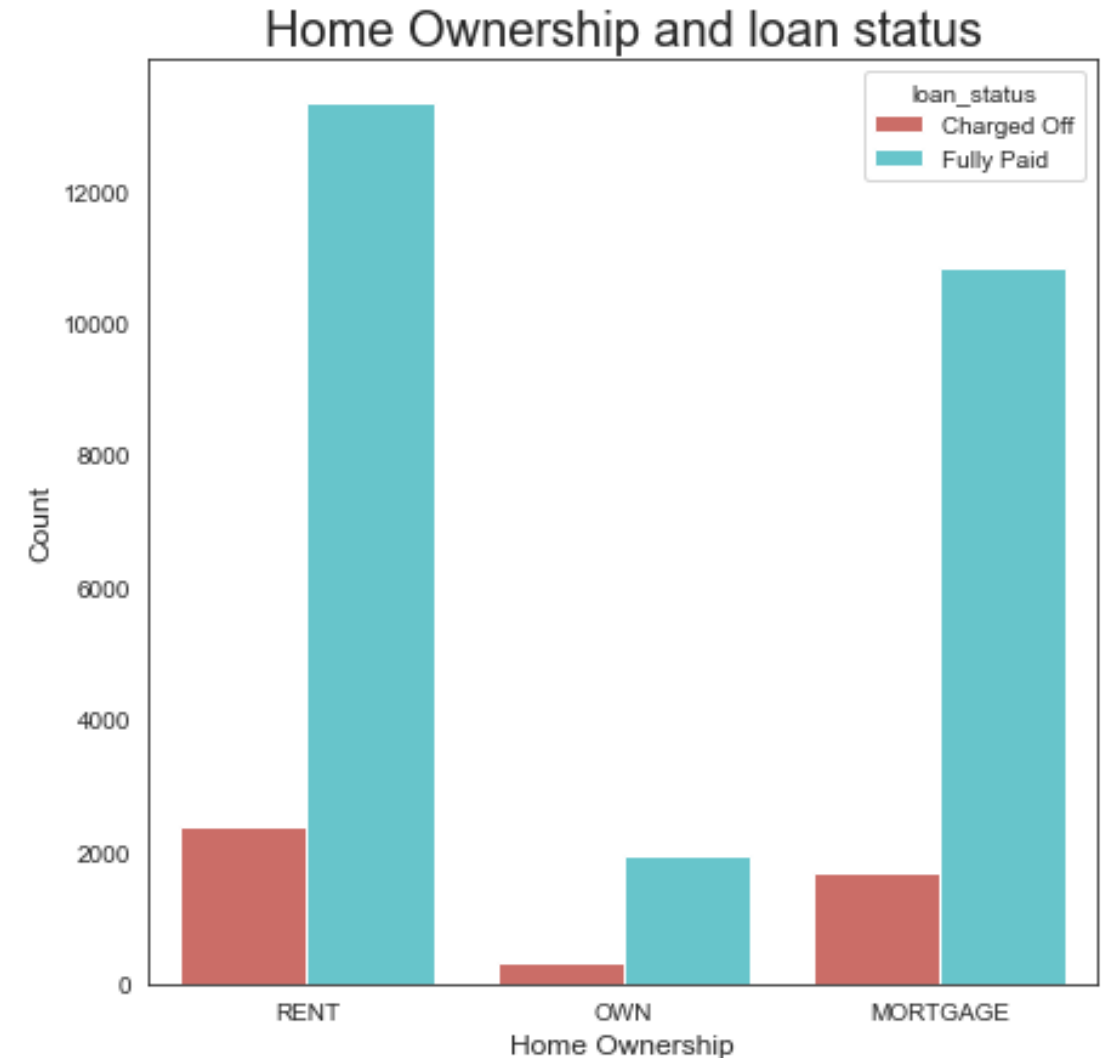
Interest Rate Vs Loan Status

- When the loan interest rate is higher, it is likely to have high defaulter.



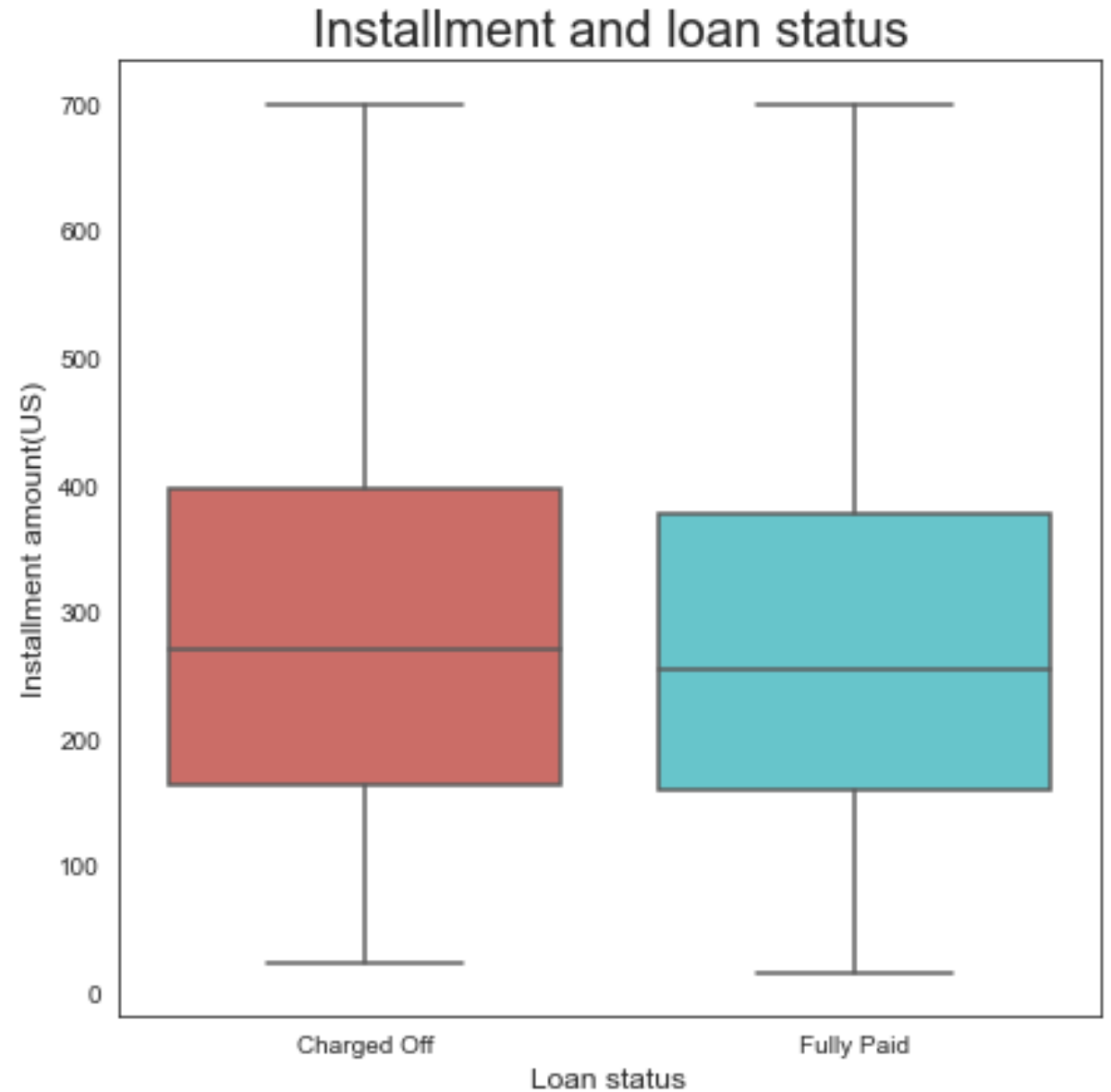
Home Ownership & Loan Status

- It is observed that borrowers fully paid is higher who rents their Home & Mortgage.
- Borrowers who own their home have less Charged off.



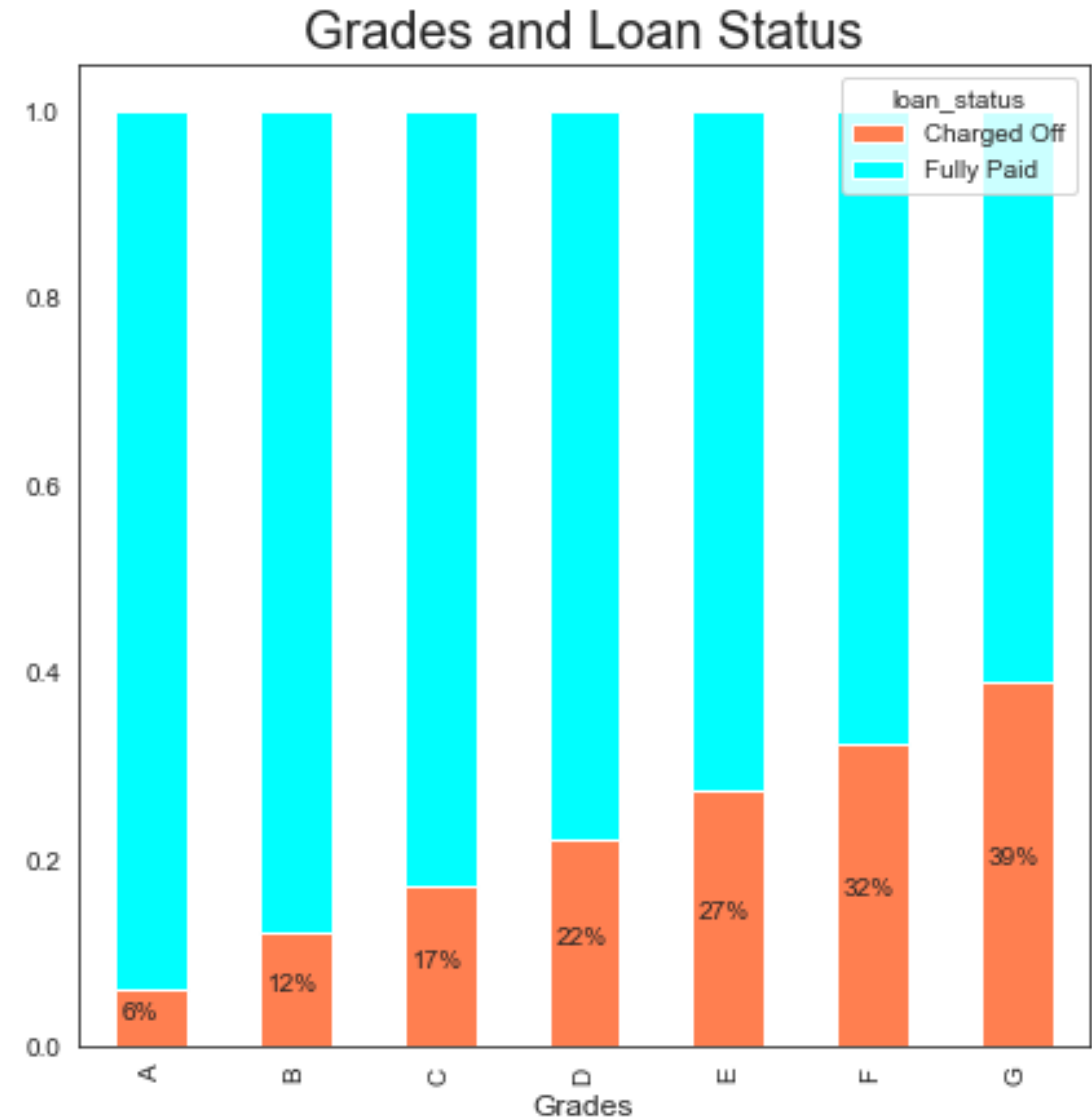
Instalment Amount vs Loan Status

The median and the 3rd Quartile people who have taken higher instalment amount are more likely to charge off.

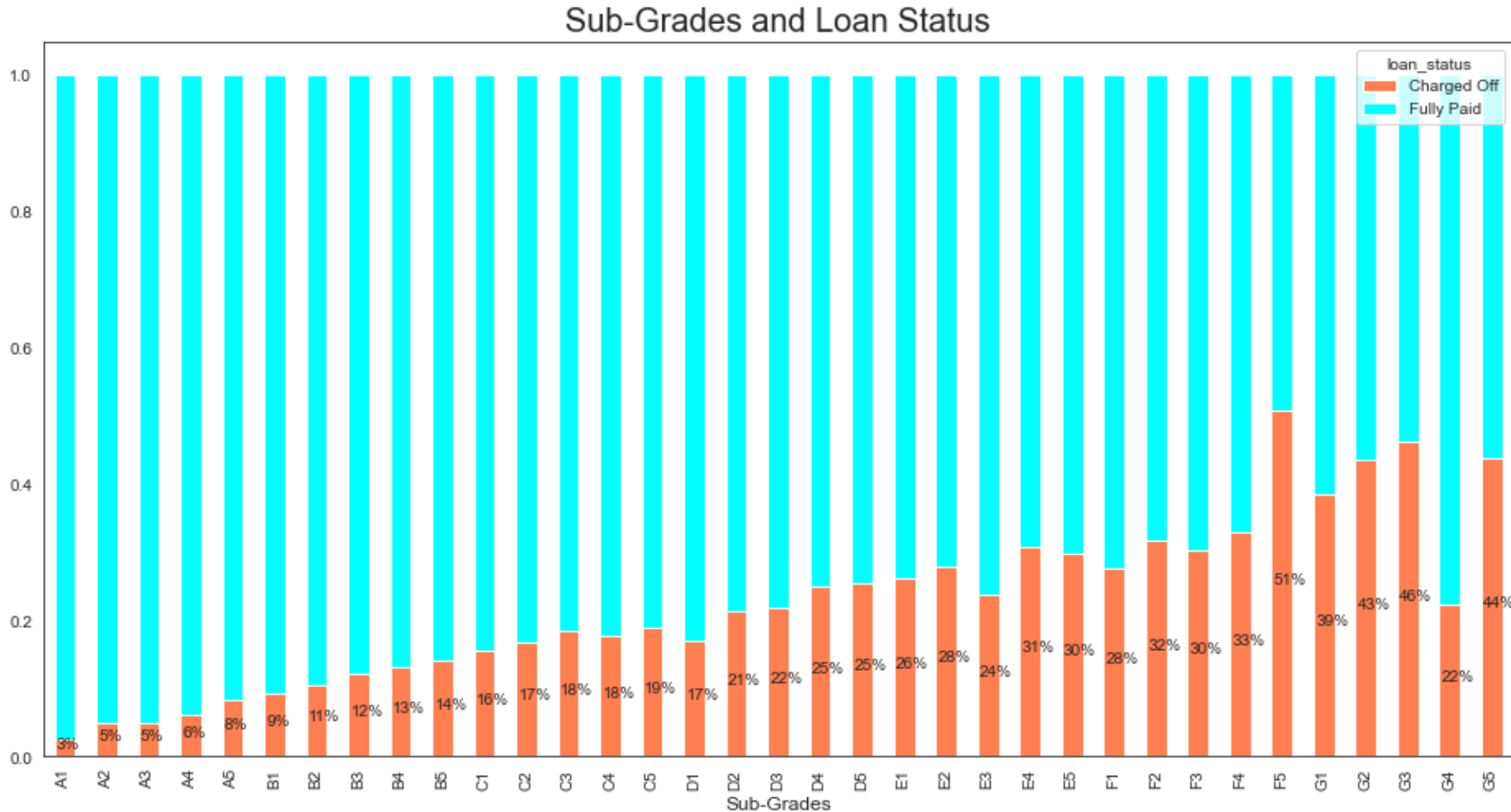


Loan Grades Vs Loan Status

- As the grades get lower, charge off rates get increased proportionately.
- From the graph, it is observed that Lower grade loans have higher charge offs.

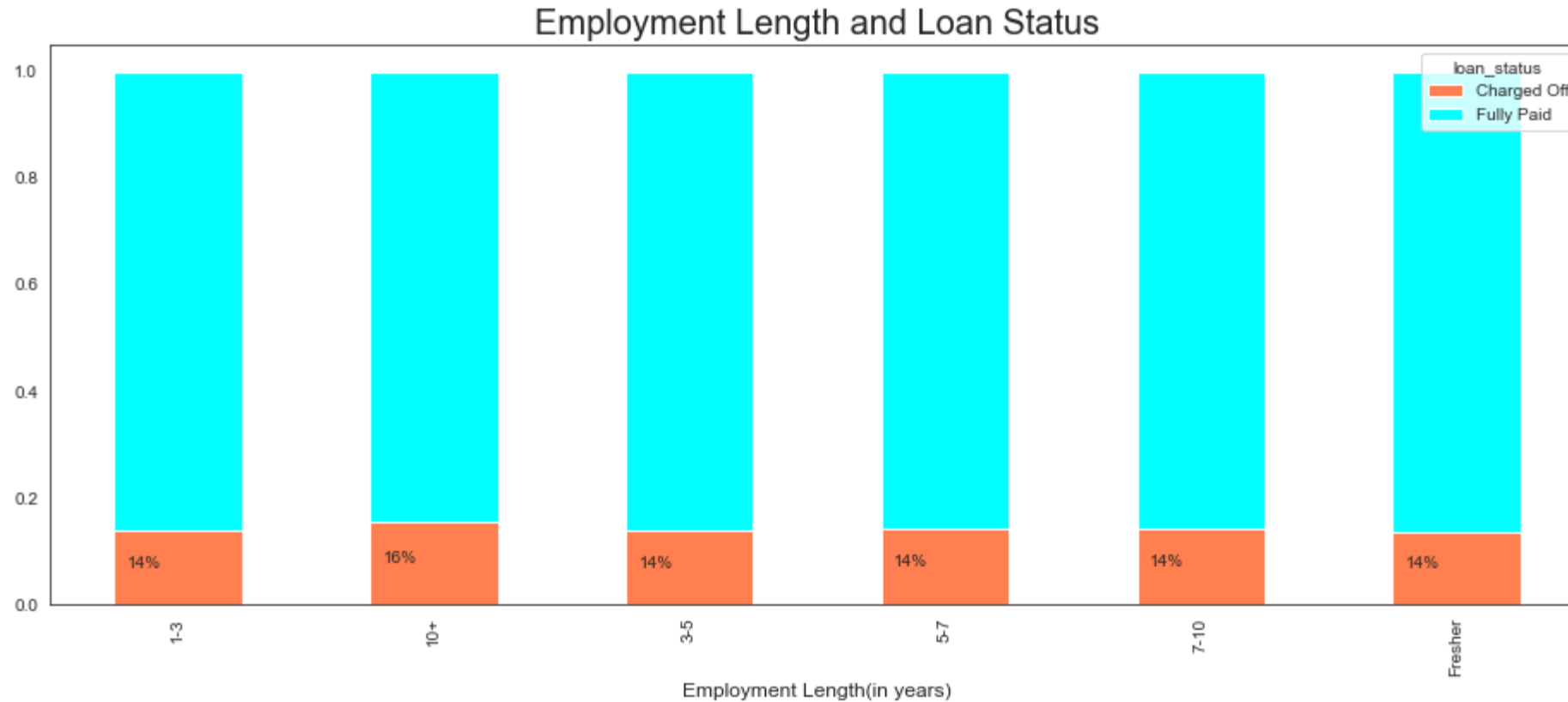


Sub Grades of Loan Vs Loan Status



- A1 grade is the best grade to give a loan.
- As subgrades gets low, Charge off rate increases proportionately.

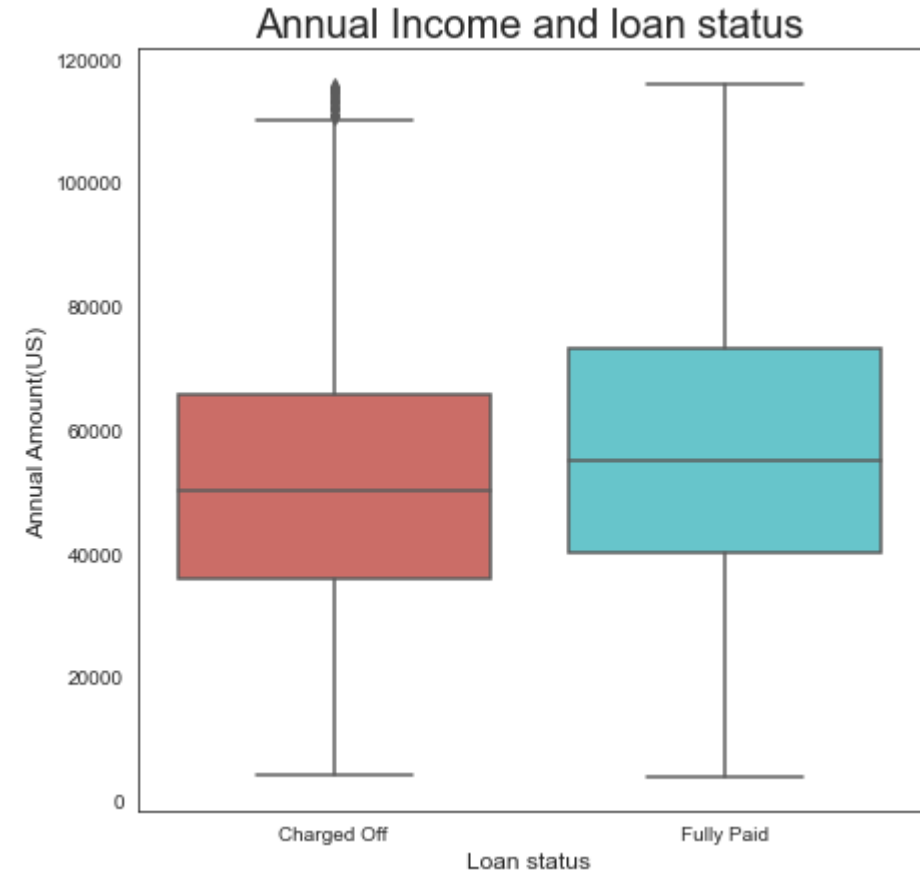
Employment Length Vs Grades of Loan Vs Loan Status



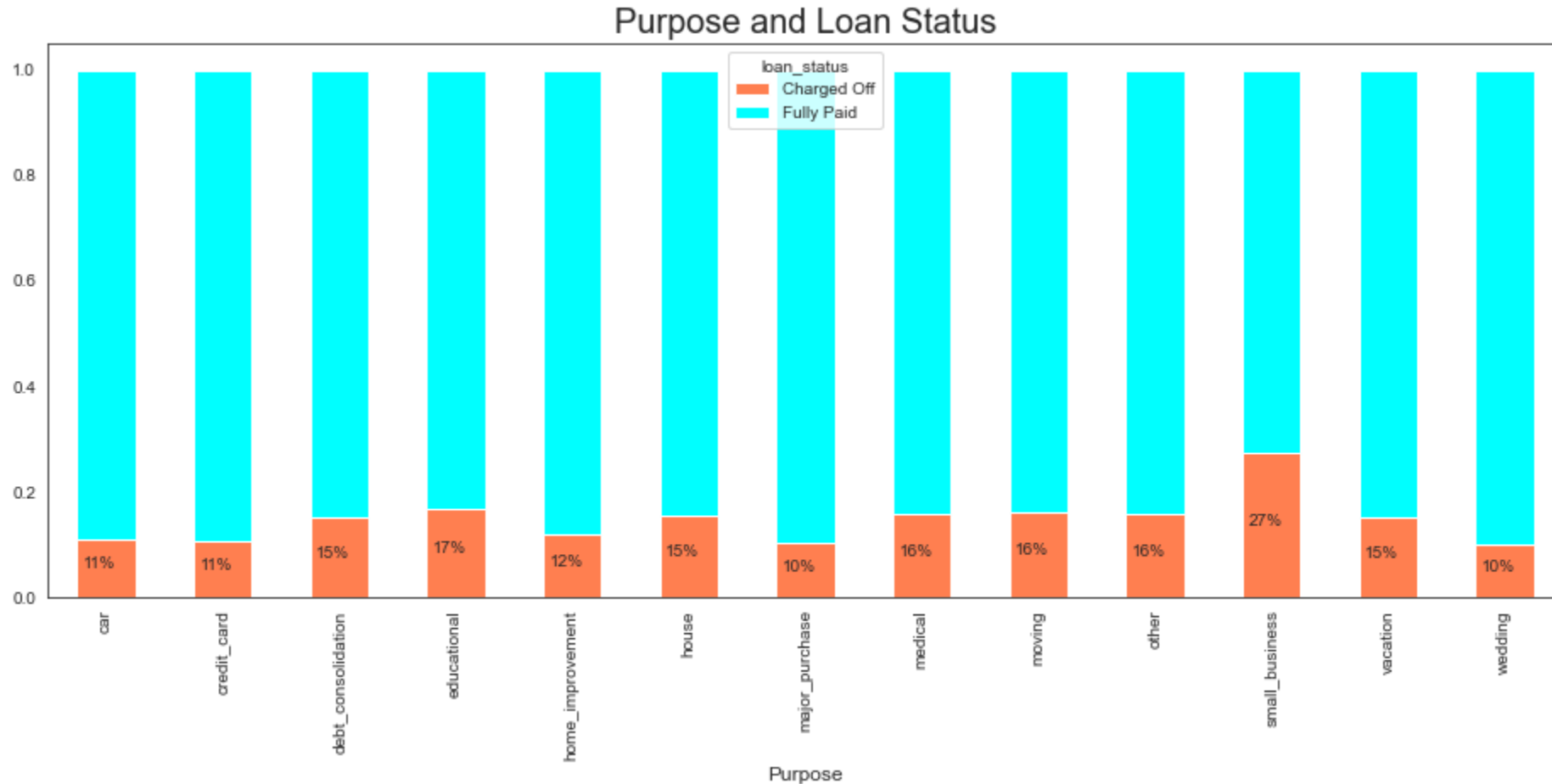
Employment Length as fresher or experienced people, Charged off is constant.

Annual Income vs Loan Status

- People having less income are likely to default .
- The median Annual income is less for charged off people.



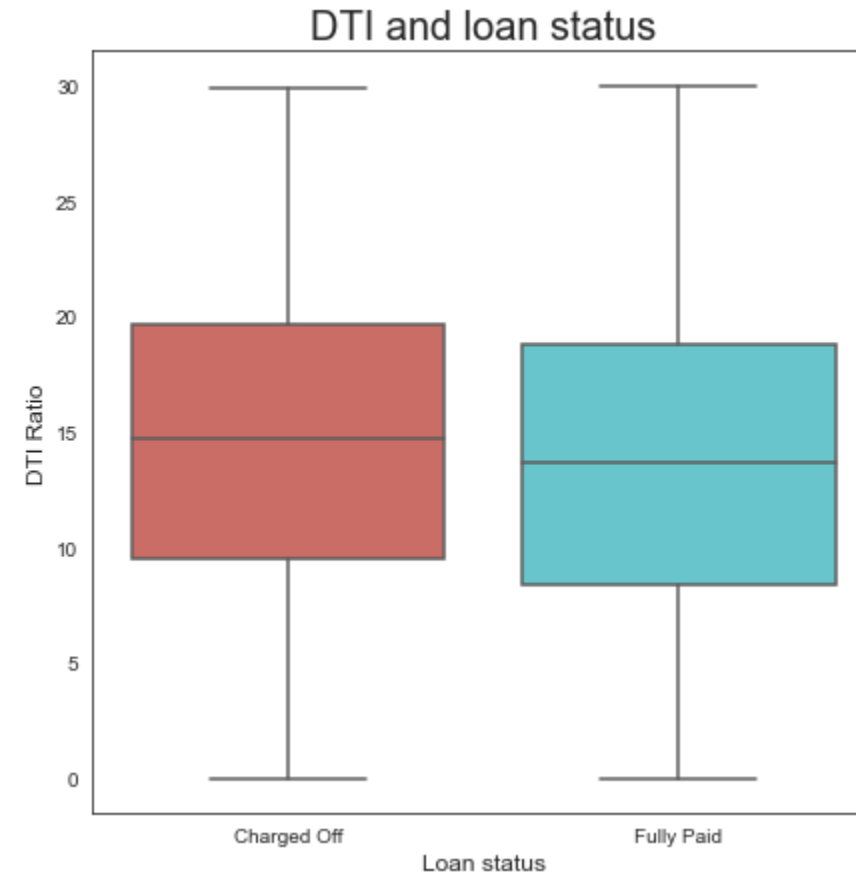
Purpose Vs Loan Status



It is observed that Small business are likely to charge off when compared to other purpose, as they are 28% of people got charged off.

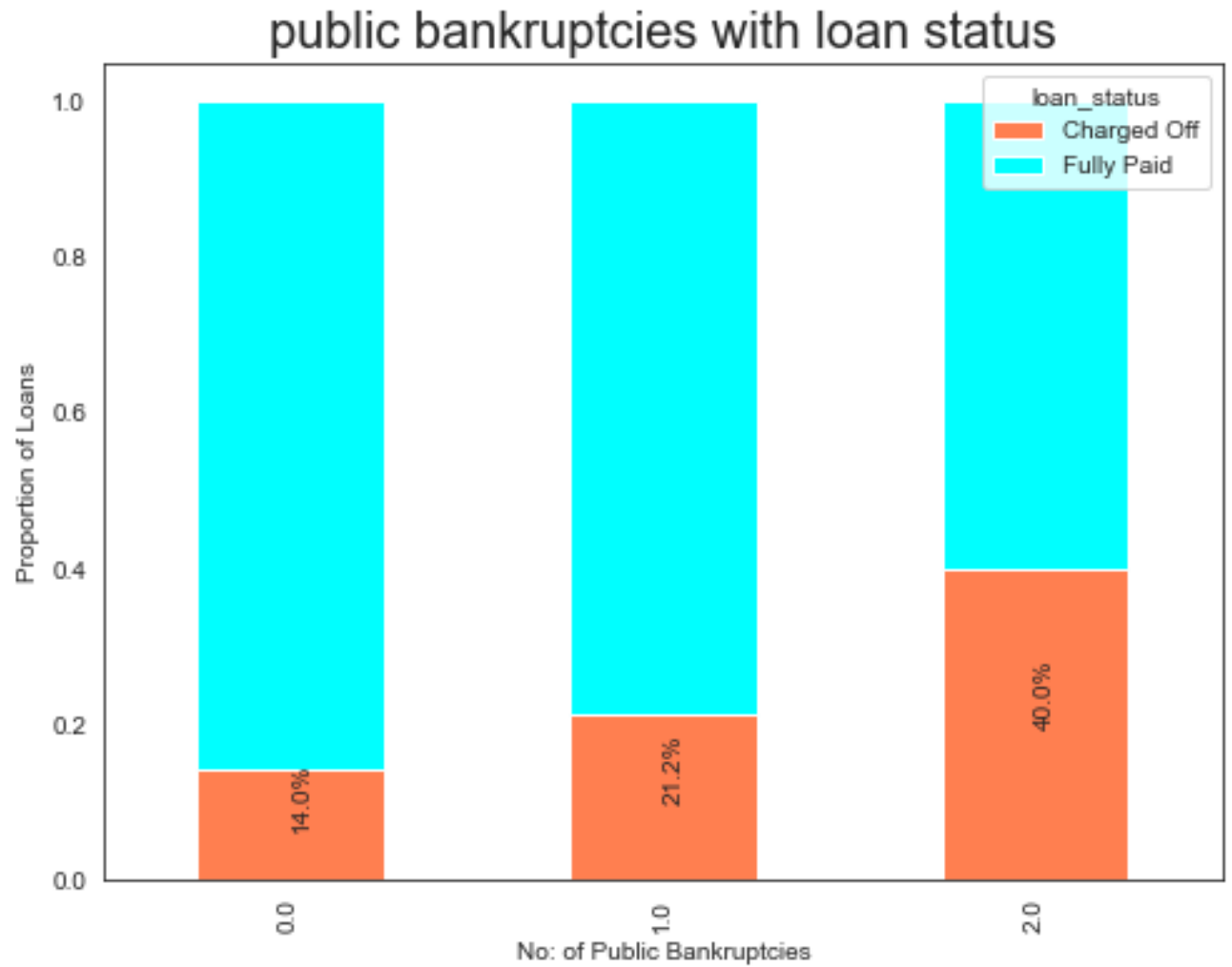
DTI Vs Loan Status

- DTI is the ratio calculated using the borrower's total monthly debt payments on total debt obligations, excluding mortgage & requested LC loan, divided by the borrowers' Self reported monthly income.
- It is observed that higher the DTI, there are more likely to have a charged Off.



Percentage of Loans Vs Number of Public Bankrupts

The number of Bankrupts &
charge off rate increases



Conclusions

Univariate Analysis

- Loan Applied lies between 500 -35000 Loan Amount
- More of the Amount asked by the borrowers are 5000 & 10000.
- Most of the borrowers need Amount less than 15000.
- Most of the people 's amount is Approved.
- More people have charged off.
- Most of the people, around more than 25000 people have chosen 36 month tenure, while only 1000 people have chosen 60 month tenure.
- Most of the people have taken loan in 2011 and then after each year, the number of loan borrowers have increased.
- Most of the people taken loan in the end of the year.
- There is a need to promote other months mainly in the begging of each year to increase profit.
- People having 10+ years of experience are most of the Loan applicants
- Years of Experience values lies between 0 – 10.
- Most of the people who applied for loan are living either on rent or Mortgage.
- This concludes that around 90% of people does not own a Home.
- California State have the highest number of Loans.
- There is a requirement to promote loans to other states as well to increase profits.

Conclusions

Bivariate Analysis

- The interest rate in charged Off is higher than that of Fully Paid, which incurs that higher interest rates results in higher charge Offs.
- The Percentage of Loan not payed off is more in 60 months tenure with about 25% charge off, while It is 11% for 36 month tenure.
- Thus Longer term loans are more risky & prone to higher amount of people not paying off.
- When the loan interest rate is higher, it is likely to have high defaulter.
- It is observed that borrowers fully paid is higher who rents their Home & Mortgage.
- Borrowers who own their home have less Charged off.
- The median and the 3rd Quartile people who have taken higher instalment amount are more likely to charge off.
- As the grades get lower, charge off rates get increased proportionately.
- A1 grade is the best grade to give a loan.
- As subgrades gets low, Charge off rate increases proportionately, it is observed that Lower grade loans have higher charge offs.
- Employment Length as fresher or experienced people, Charged off is constant.
- People having less income are likely to default .
- The median Annual income is less for charged off people.
- It is observed that Small business are likely to charge off when compared to other purpose, as they are 28% of people got charged off.
- It is observed that higher the DTI, there are more likely to have a charged Off.
- The number of Bankrupts & charge off rate increases