



# Lending Club Case Study

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# Objective

The Objective of this case study is to implement EDA technique on a real world problem and understand the insights and present in a business first manner via presentation.

Benefits of the case study:

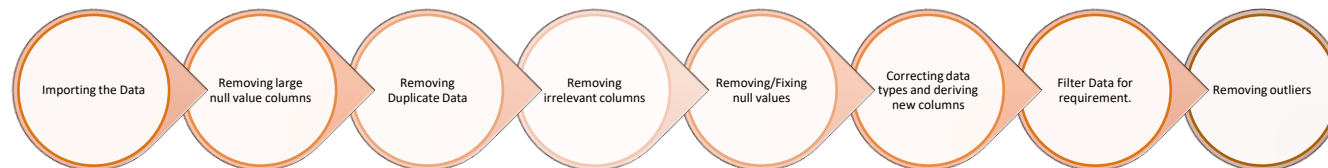
- Ø Gives an idea about how EDA is performed in real life business problems.
- Ø It also develops a basic understanding of risk analytical factors in banking and financial services.
- Ø How the data is used to optimize loss of money while lending it to clients.
- Ø It improves our understating of visualization tools and what charts to use for real life data.

The business objective is to take a decision whenever they receive a loan application whether to reject or approve based on certain variables.

### **Dataset Details:**

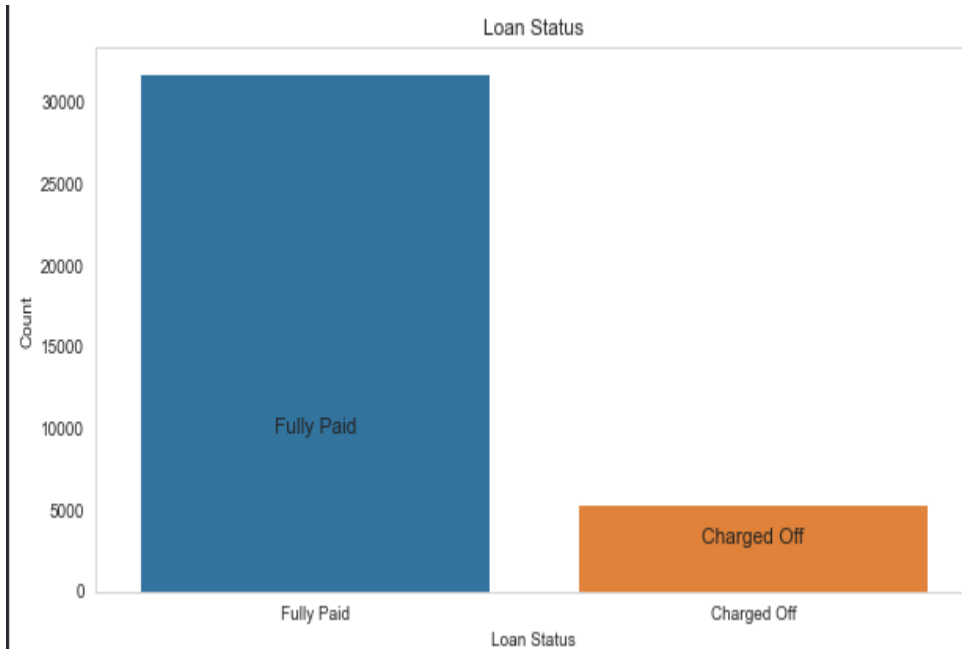
The data given below contains information about past loan applicants and whether they 'defaulted' or not. Data has details regarding approved loan not the rejected ones. It has 3 status of loan which is Fully Paid, Current and Charged-Off.

### **Data Clean-up and preparation process:**

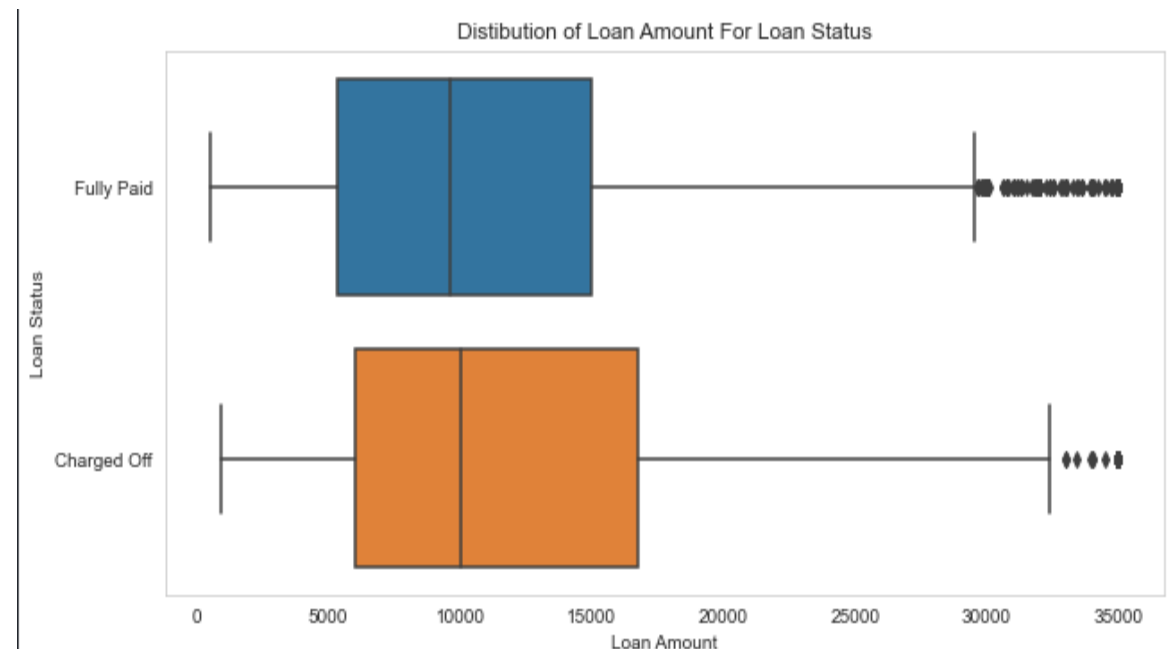


# Business Understanding

# Loan Status and Amount



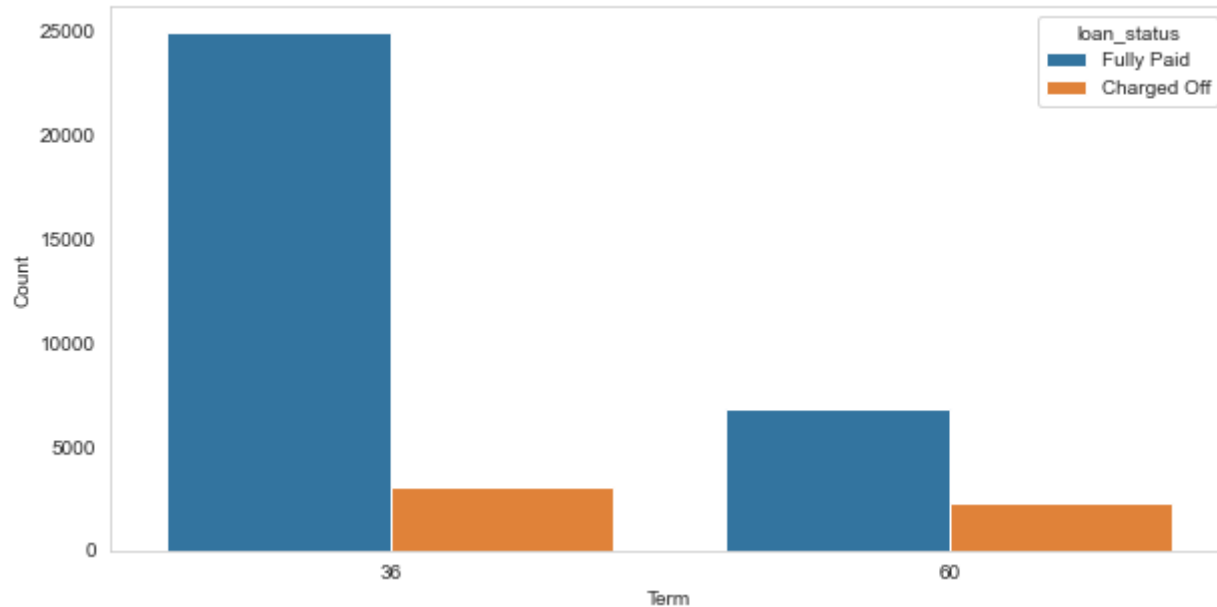
- **Loan Status:** The number of charged off loan is much smaller(14.5%) compared to total count.



- **Loan Amount:** It varies from 500 to 35000 with a median of 10000. Loan amount is majorly small and very few clients have taken large loans and larger it goes we have higher chance of defaulting.

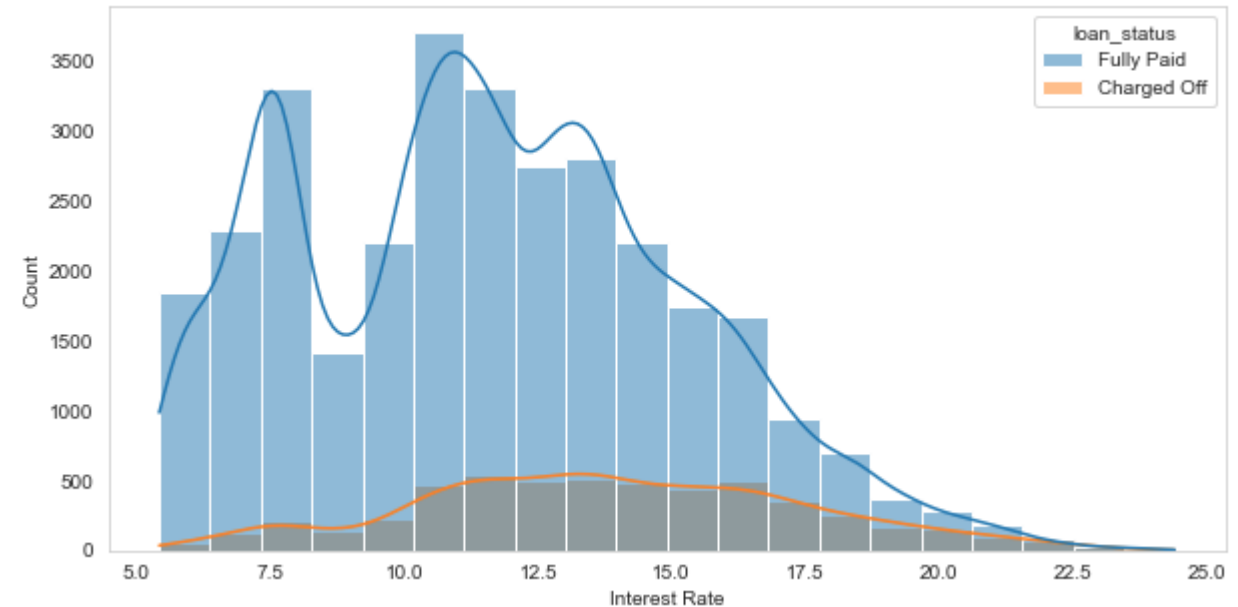
# Term and Interest Rate

Distribution of Term For Loan Status



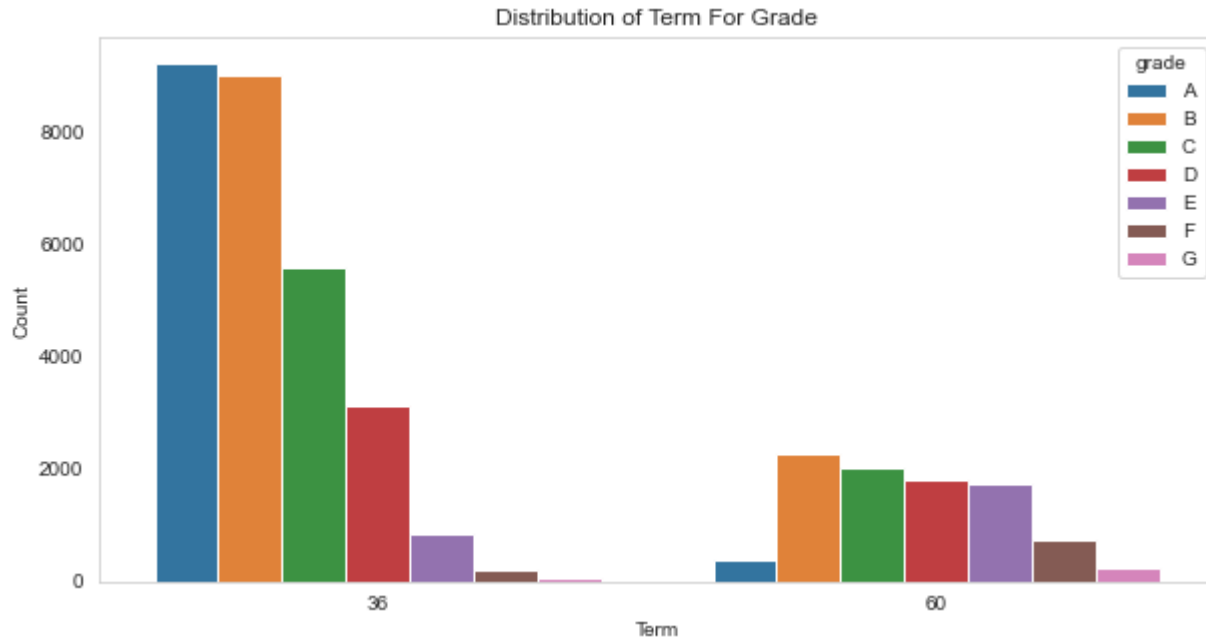
- **Loan Term:** The Loans taken for 36 month term are much more than 60 months and have lower chance of defaulting.

Distribution of Interest Rate For Loan Status

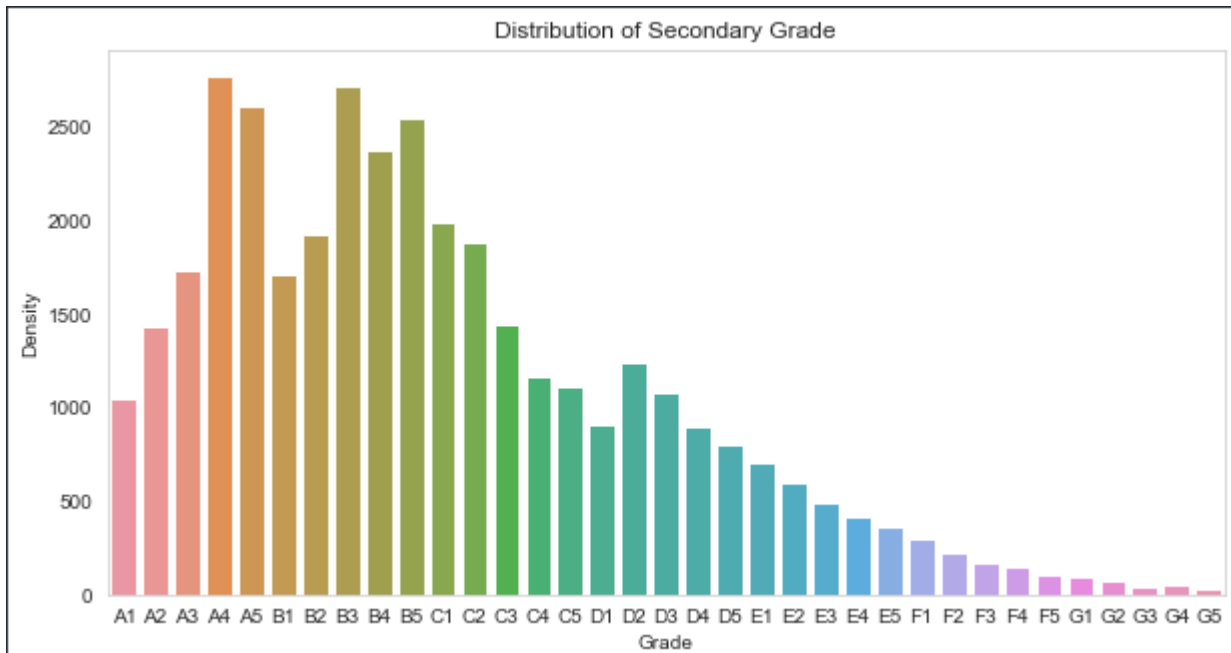


- **Interest Rate:** The count of loan taken varies with interest rate showing peak around in 5-15 bracket and decreasing slowly where as the chance of defaulting increases with interest rate.

# Grade and Sub-Grade



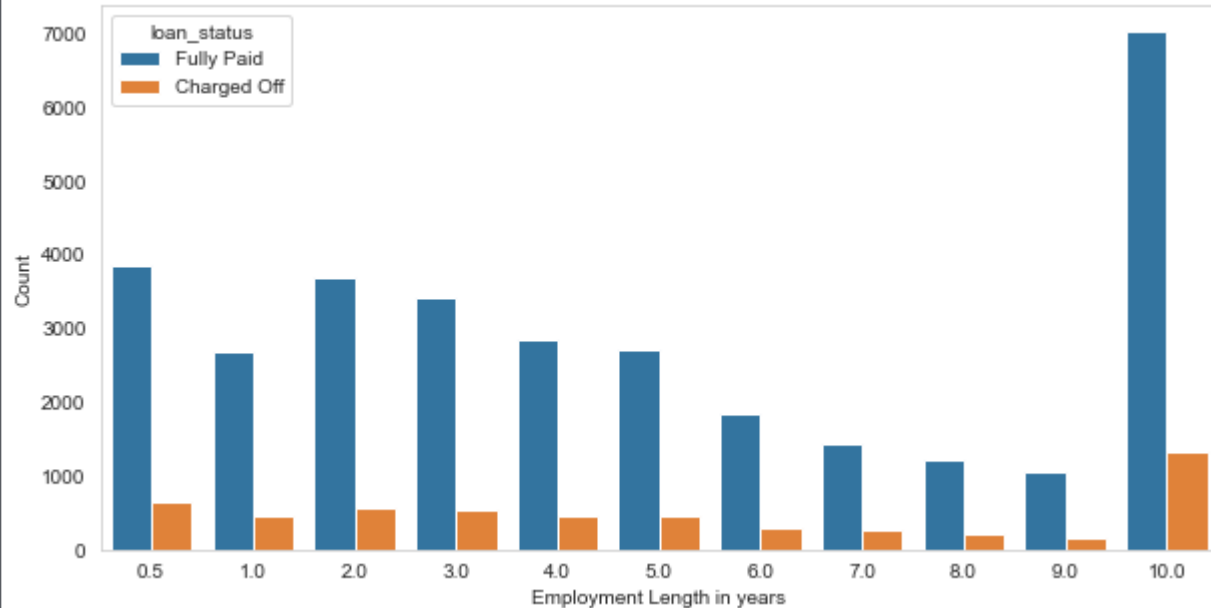
- **Grade:** The loan approved are majorly of higher grade as they are of low risk thus low chance of defaulting. 60 month term loans have larger number of lower grade loans with high risk.



- **Sub Grade:** This provides more insight that the loans within grade are more skewed towards lowered sub grades.

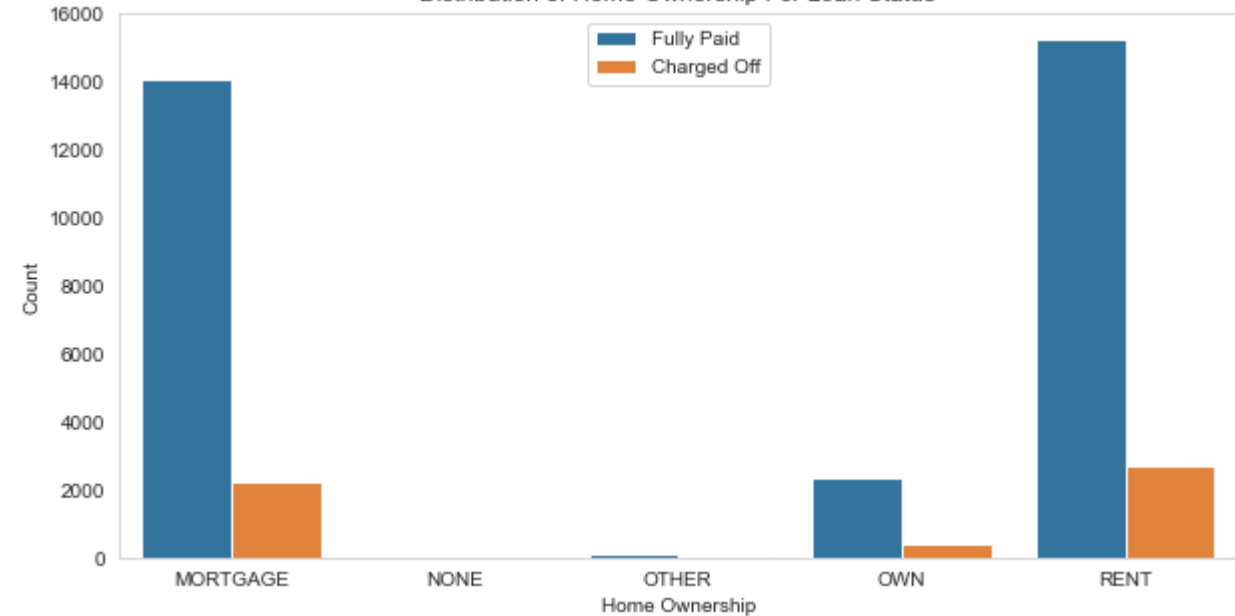
# Employment Length & Homeownership

Distribution of Employment Length For Loan Status



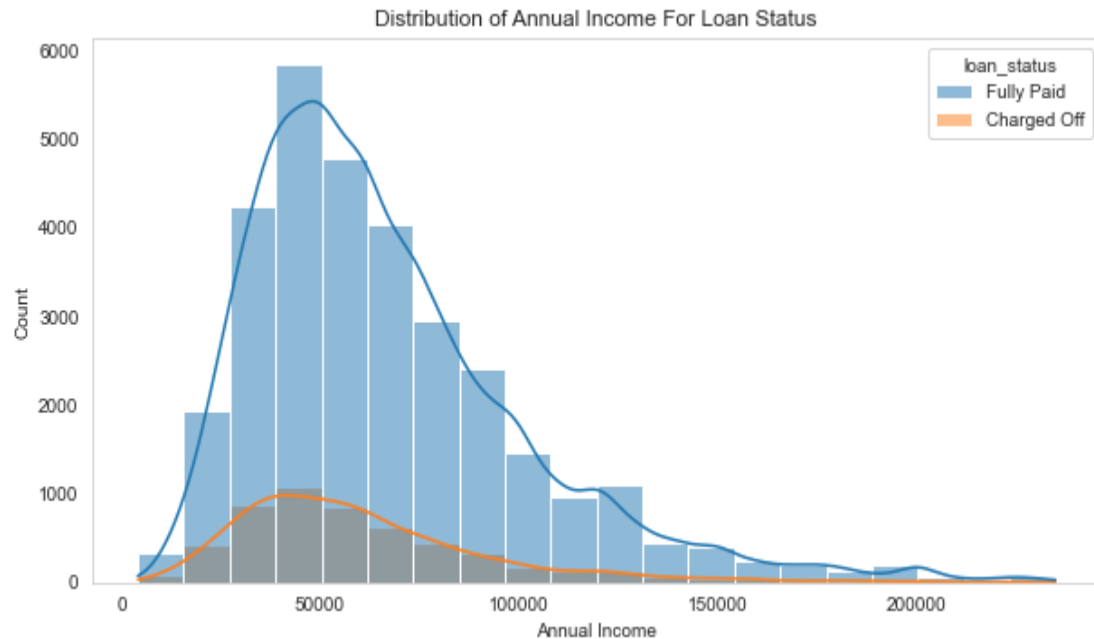
- **Employment Length:** Majority of clients have 10+ years of experience and has highest number of defaulted loan.

Distribution of Home Ownership For Loan Status

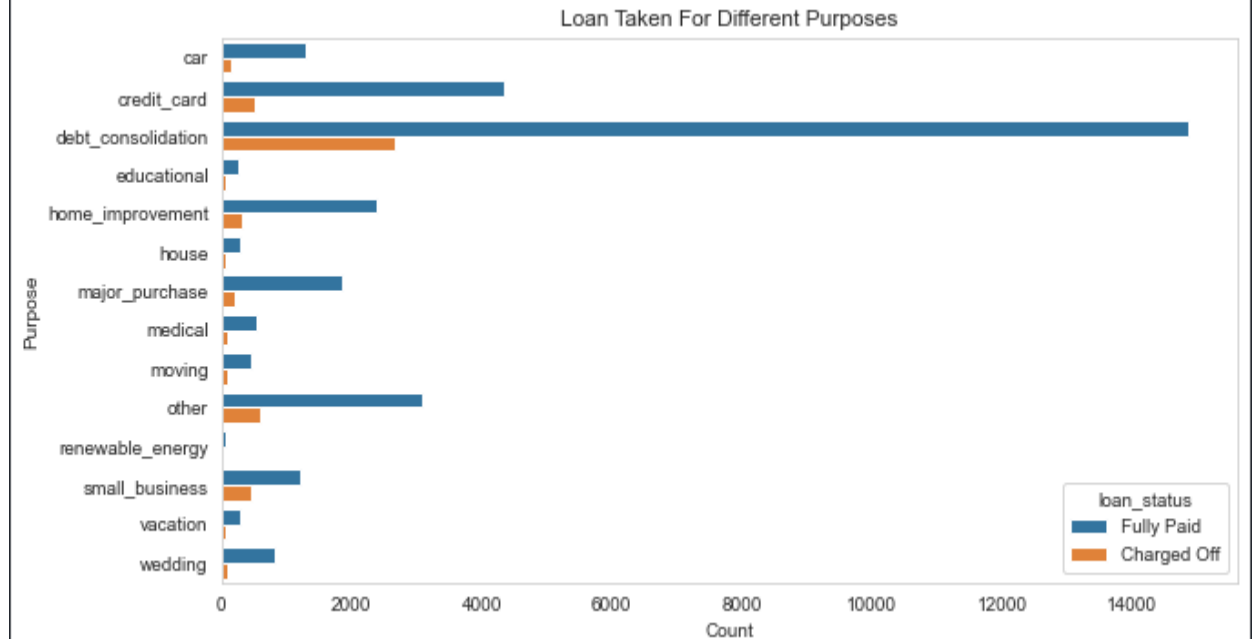


- **Home Ownership:** Majority of clients are lacking ownership of any property and are on rent or mortgage and have a higher chance of defaulting.

# Annual Income & Purpose



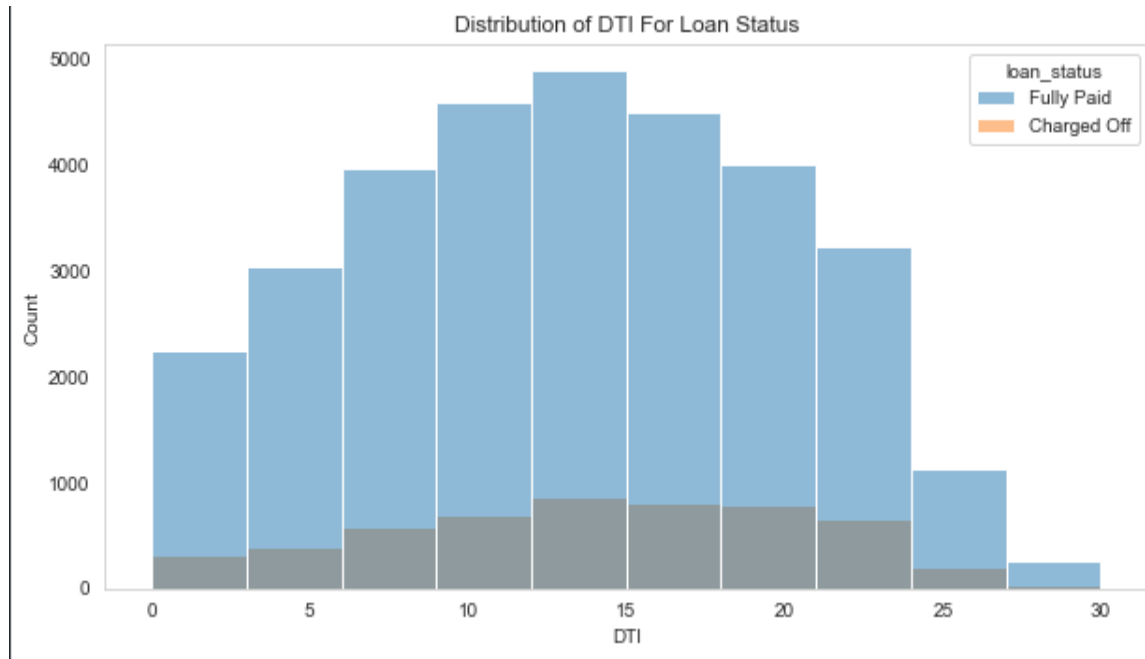
- **Annual Income :** The Majority of clients have low annual income compared to rest and income lower than 50k has higher chance of defaulting.



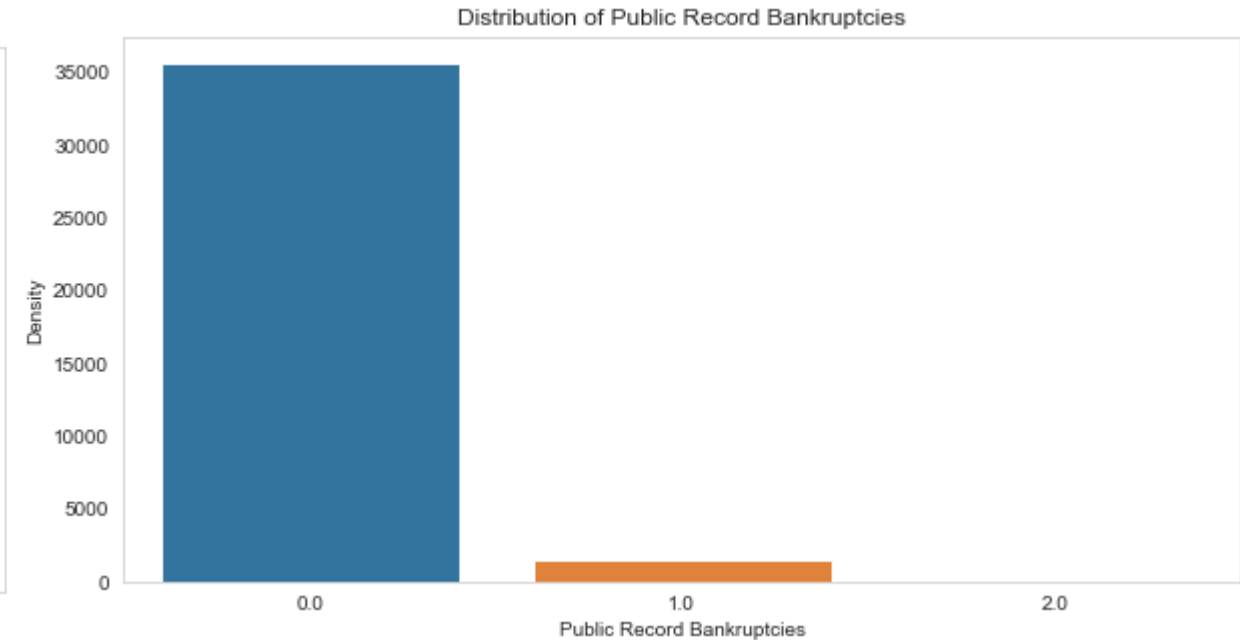
- **Purpose:** Loans are taken mostly for debt consolidation followed by credit card payment. Whereas the debt consolidation has highest fully paid loan but also has highest defaulted loans as well.



# DTI ratio & Bankruptcy



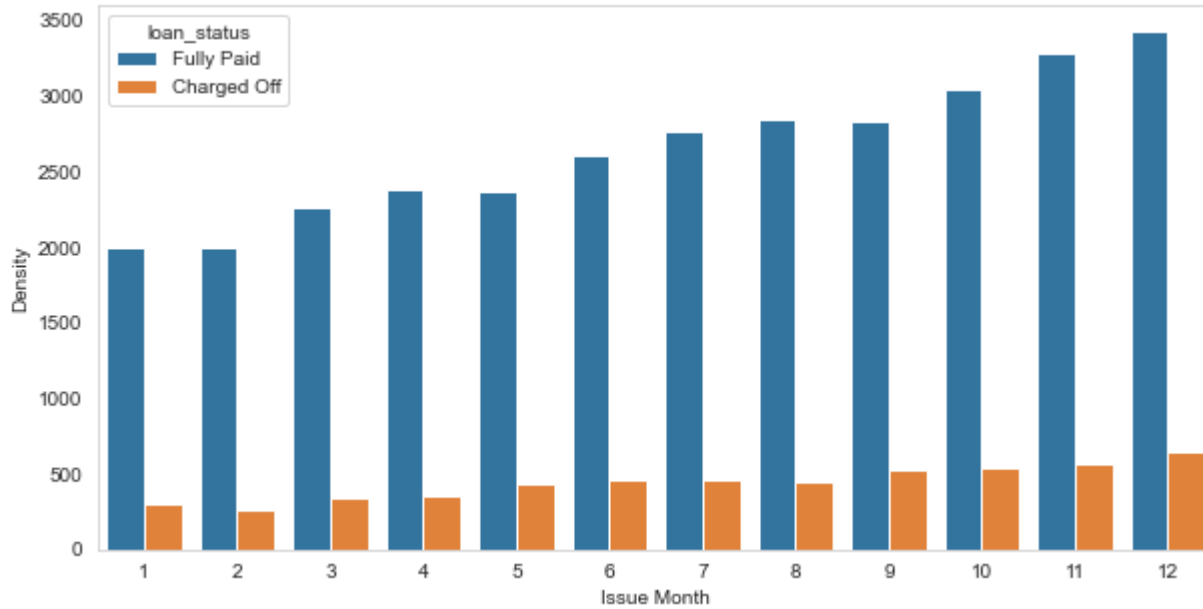
- **DTI:** A high proportion of clients have a high debt-to-income ratio, indicating that lending to these clients carries a high risk.



- **Public Recorded Bankruptcy:** Majority of clients have no record of declaring bankruptcy.

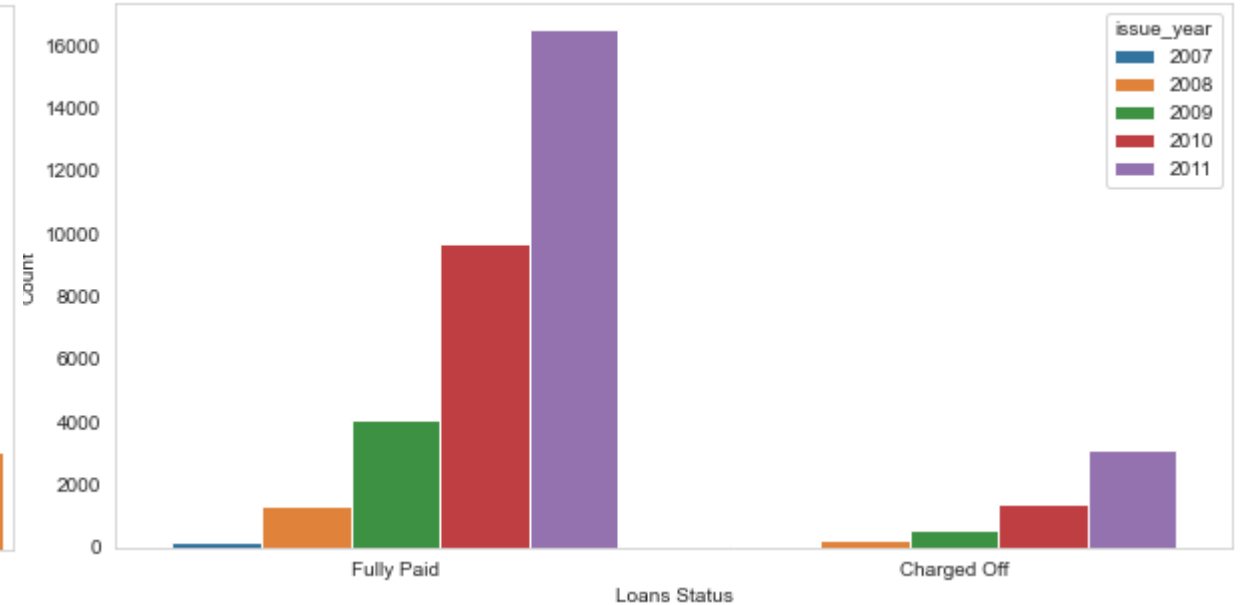
# Loan Trend over years

Distribution of Loan Issue Month



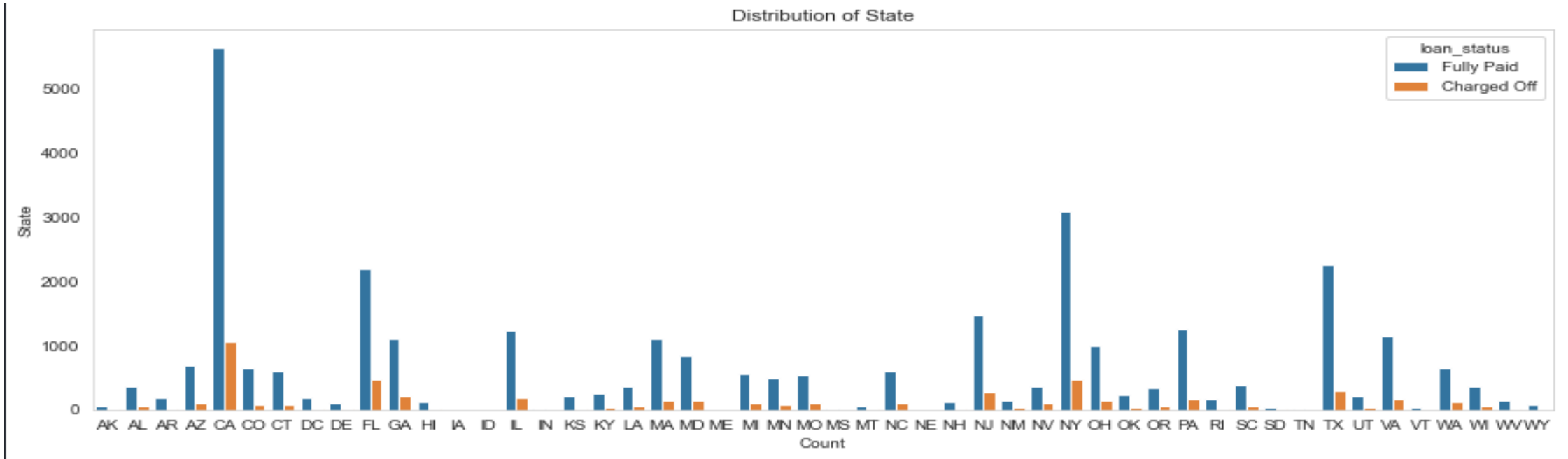
We see a gradual increase in loan taken through the year, with lesser defaulting rate in April, August, December quarter wise and better more late in year.

Distribution of Loan Status For Issue Year



With each passing year loan taken are increasing exponentially which indicate we are seeing large increase in DTI ratio and decrease in defaulting rate.

# Location Based



For large metropolitan cities we see large number of loans, with higher number of defaulted loans like California, New York, Texas, Florida but have a lower chance of defaulting.

# Recommendations

## Recommendations

Main Driving factor which can be used to predict the chance of defaulting and avoiding Credit Loss:

1. DTI
2. Grades
3. Verification Status
4. Annual income
5. Pub\_rec\_bankruptcies

Other considerations for 'defaults' :

1. Borrowers not from large urban cities like California, new york, texas, florida etc.
2. Borrowers having annual income in the range 50000-100000.
3. Borrowers having Public Recorded Bankruptcy.
4. Borrowers with least grades like E,F,G which indicates high risk.
5. Borrowers with very high Debt to Income value.
6. Borrowers with working experience 10+ years.