



LENDING CLUB CASE STUDY

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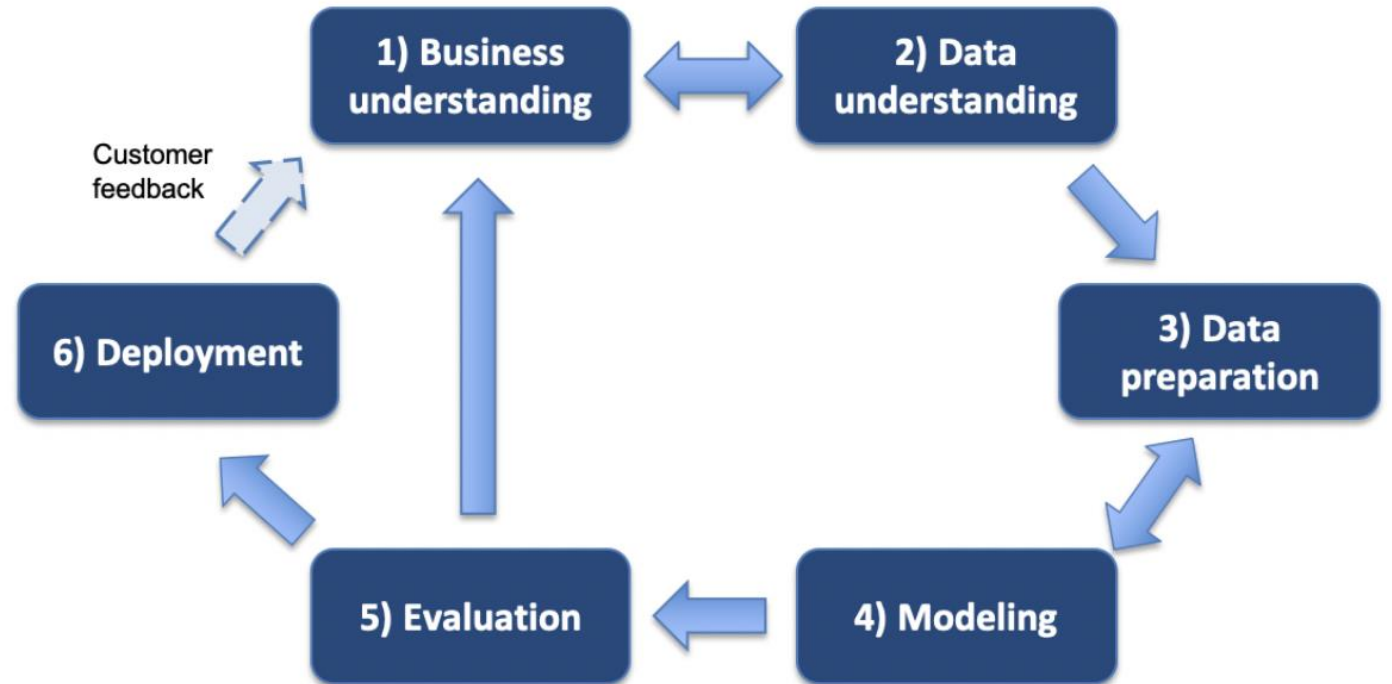
Case Study Objectives

Identifying Loan
Applicant traits
that leads to
Loan defaulters

Understanding
the factors that
results in Loan
Default
Phenomena

Providing a
clear picture on
the risk
analysis of the
loan applicants
to the lending
company

Problem Solving Methodology Using CRISP-DM



Data Cleaning Steps

01

Fixing Rows & Columns :

Removing unnecessary columns & rows that has no significance in the analysis

02

Missing Values :

Dropping & Imputing missing values with appropriate approach

03

Duplicate Data :

Removing identical rows & columns wherever required

04

Treating Outliers :

Removing too high & too low values to get an appropriate output

05

Fixing Invalid Values : Changing the datatypes of variables to required format

06

Filter Data :

Filtering the columns as per the analysis requirement

Analysis

Purpose of the project is to understand how the **consumer & loan attributes influence** each other in regards to **loan defaulting**

Performed **data cleaning & derived new columns**("issue_d_years" & "issue_d_months") to make the data set relevant to the analysis

Data Binning has been done to reduce the effects of minor observation errors

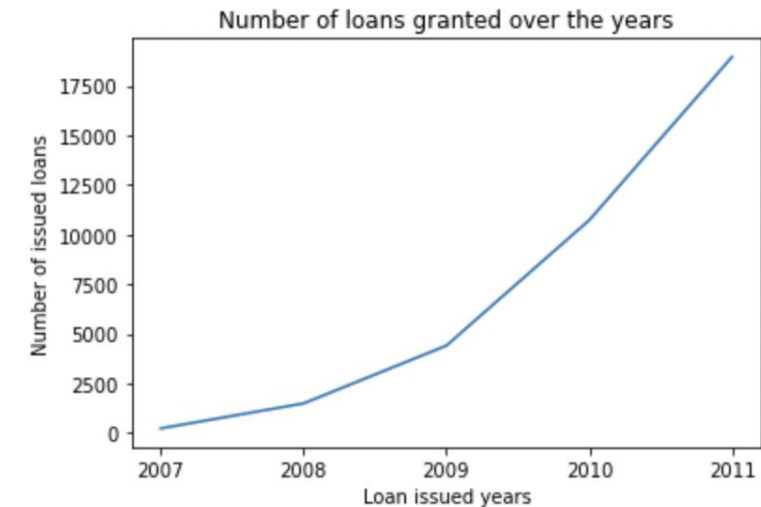
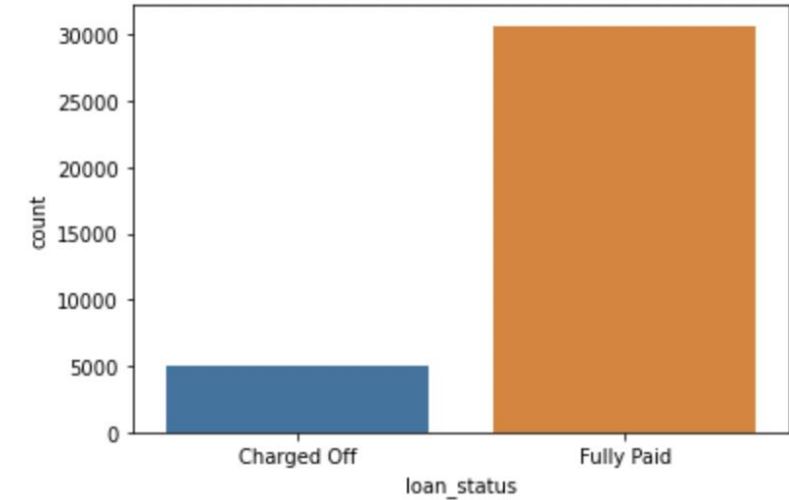
Performed **Univariate , Segmented Univariate ,Bivariate & Multivariate** analysis

- **Histogram & Bar Charts** to see the driver variables distribution
- **Box plot** to detect outliers
- **Heatmap** to see the correlation between different continuous variables

Loan Status Analysis

Observations :

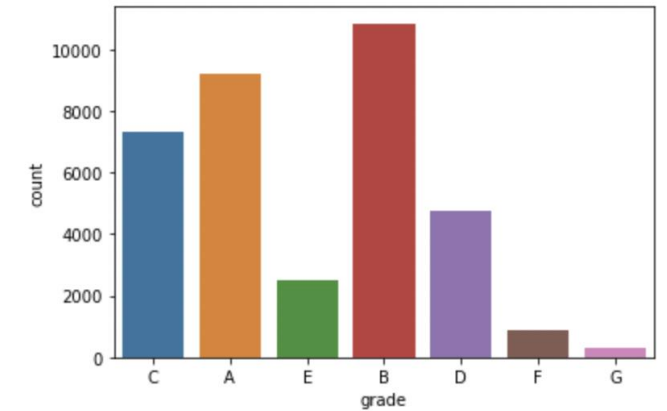
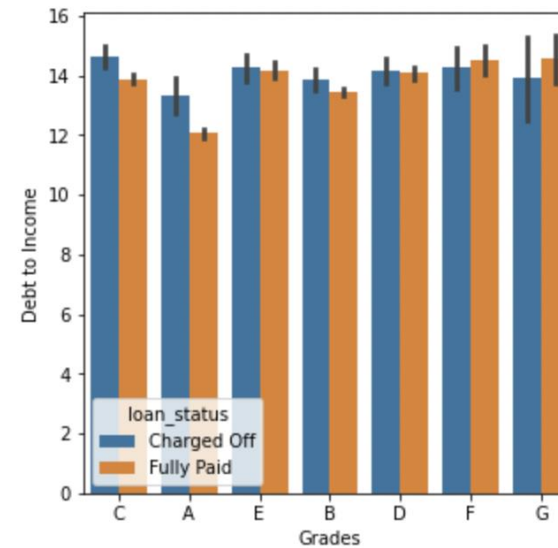
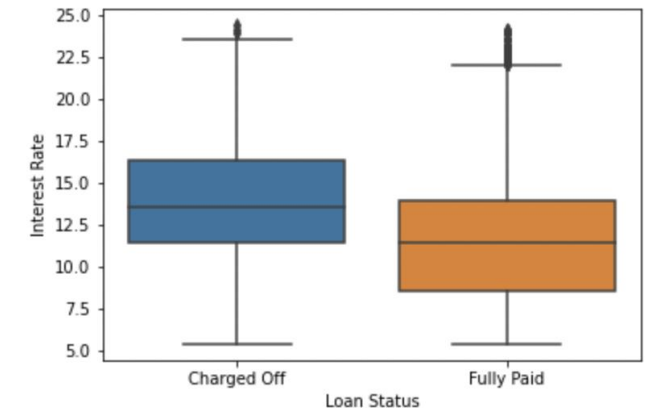
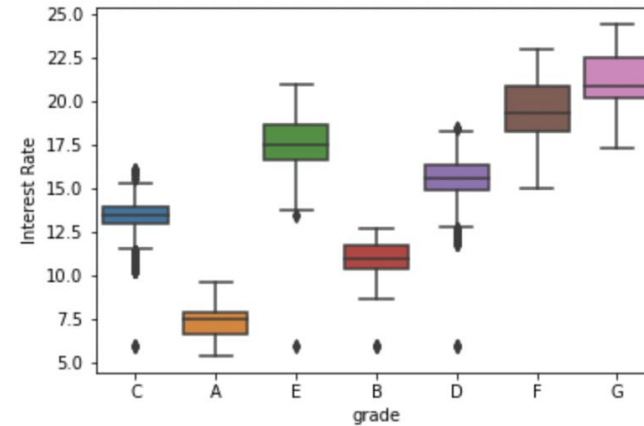
- 85.8% of the loans are fully paid (non-defaulters)
- 14.2% of the loans are charged off (defaulters)
- Loans has been increasing exponentially over the years



Loan Grade Analysis

Observations :

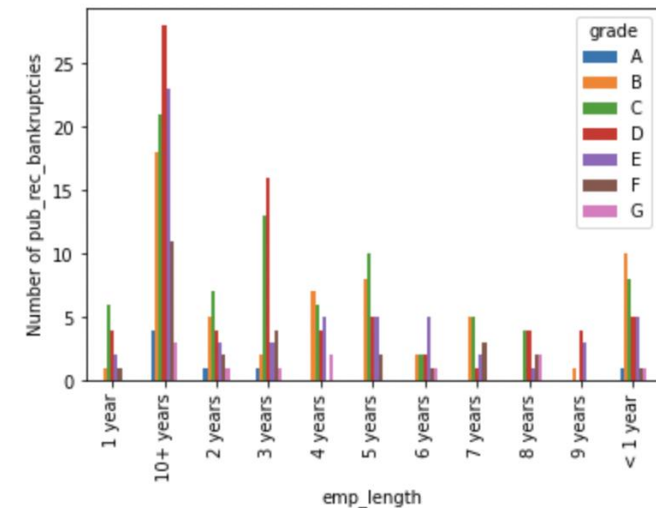
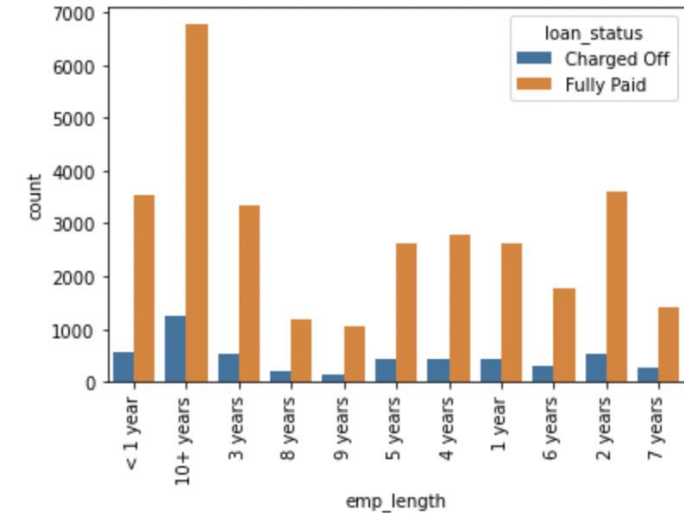
- Most of the loans are high graded loans of A & B which has low interest rates
- Low interest rate loans are mostly fully paid
- High Interest rate loans are more likely to default



Loan Applicants Work Analysis

Observations :

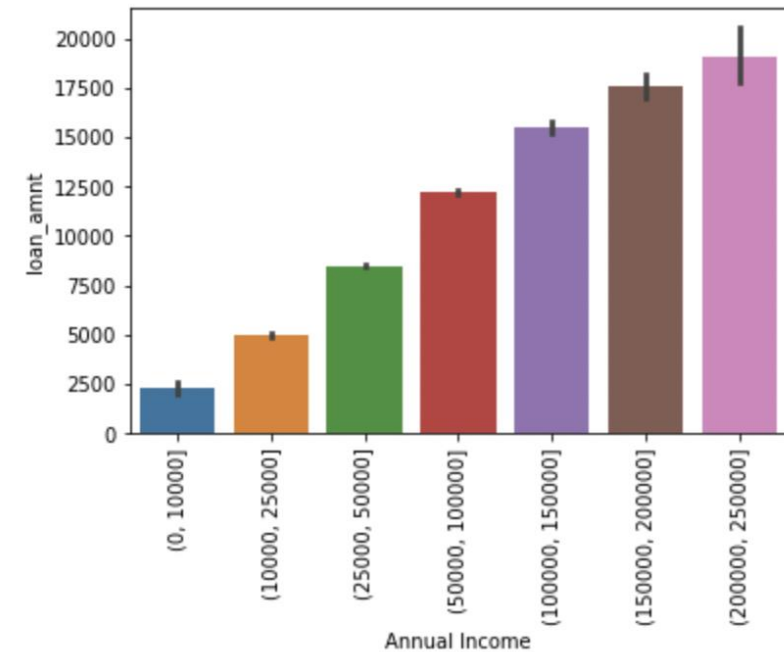
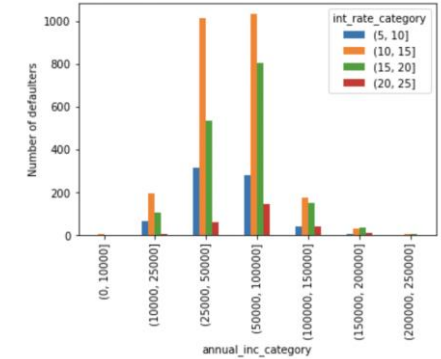
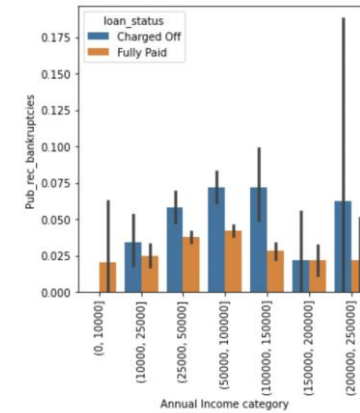
- Many bankruptcies tend to occur with Charged Off clients having 10+ years working experience and mostly they are of D-grade loans
- Majority of employee applying for loan have 10+ years of experience



Income Analysis for the Loan Applicants

Observations :

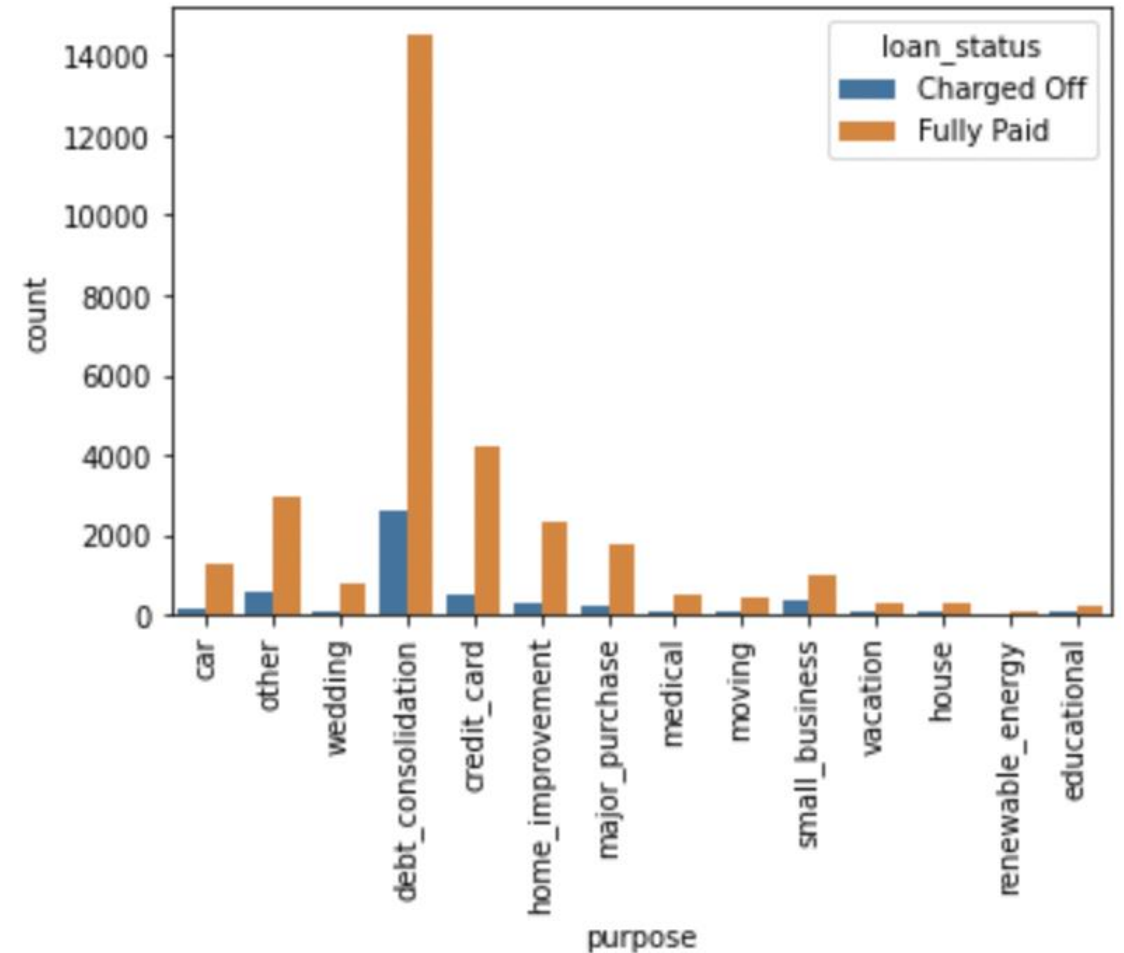
- There are no Charged Off loans for annual income <10000
- Clients with pub_rec_bankruptcies tend to get charged off
- Many defaulters tend to have [50000-100000] annual income and most probably the interest rates of these loans fall under [10%-15%] category
- As annual income increases, loan amount also increases (shows positive correlation)



Purpose for Applying Loan Analysis

Observations :

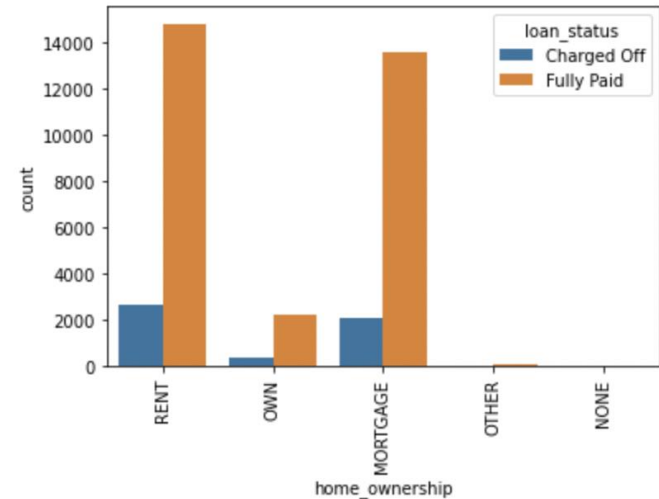
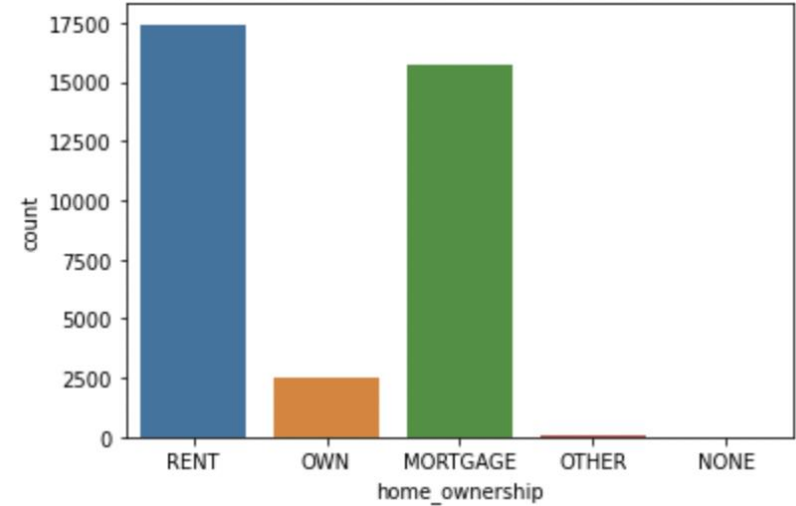
- Most of the fully paid clients have opted loan for 'debt_consolidation' purpose
- Charged off loans are also higher for 'debt_consolidation' purpose compared to other purposes of loan



Loan Status by Home Ownership

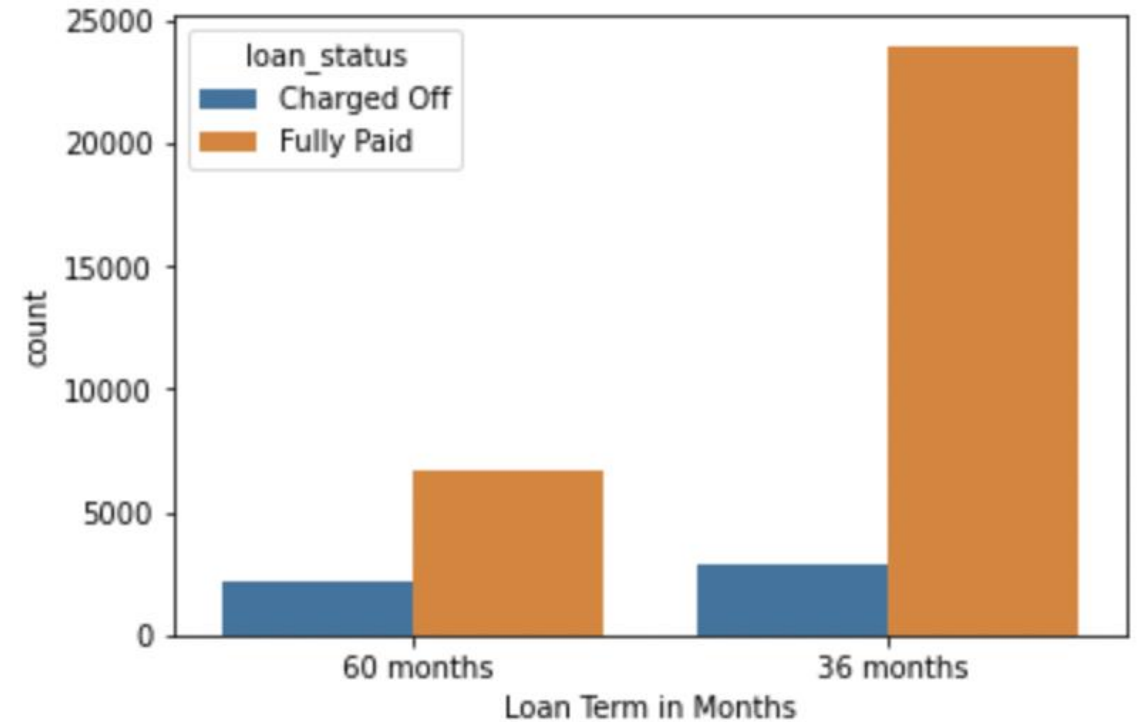
Observations :

- Most of the loans are issued for clients who stay under 'RENT' or 'MORTGAGE'
- Charged Off loans are relatively lower for clients those who own the house compared to other categories



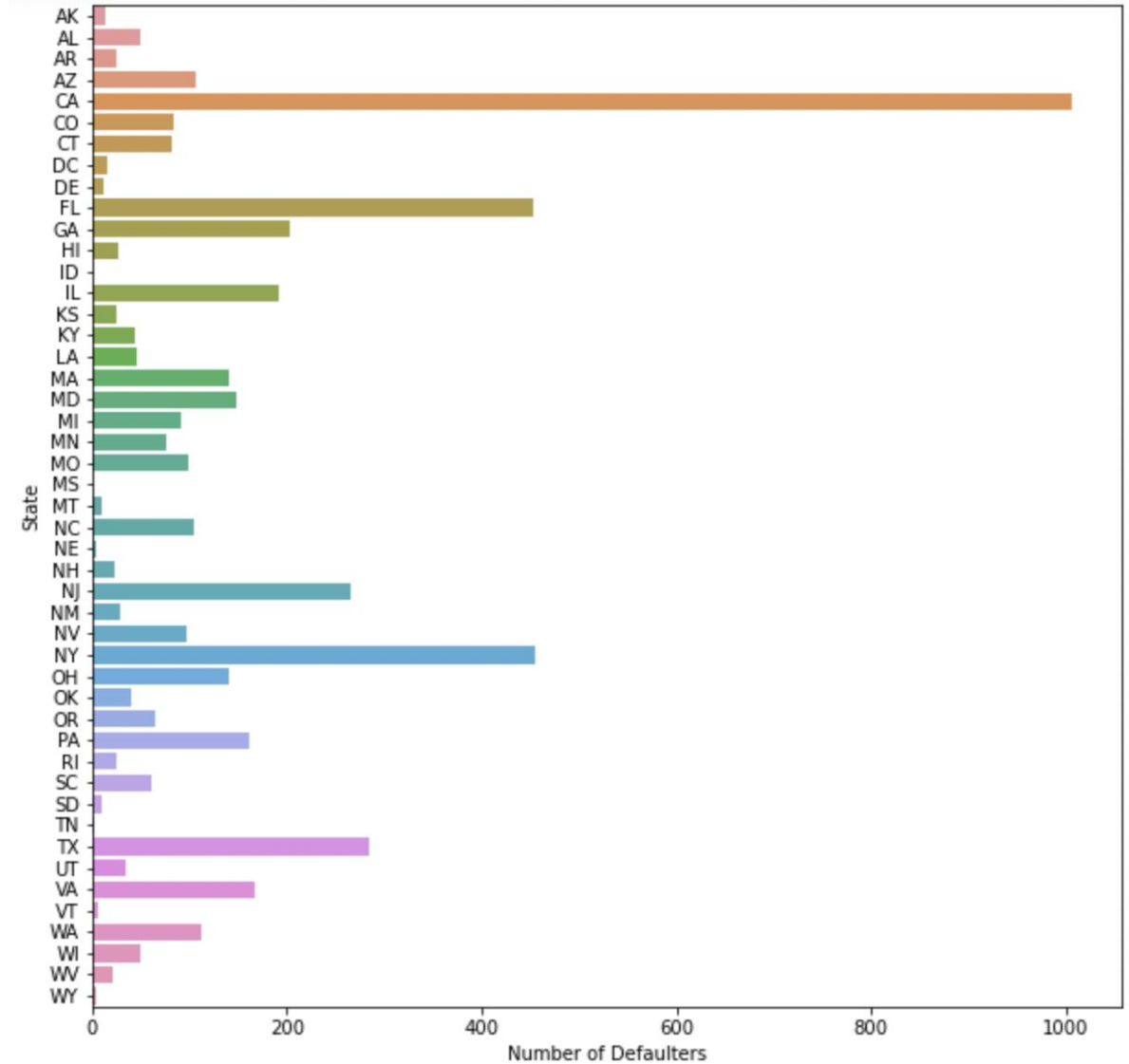
Loan Status Vs Loan Tenure

- **Observations :**
- Around 75% loans are issued for '36 months' and 25% loans are issued for '60 months'
- Loan approved for 36 months have slightly higher chances of defaulting when compared to 60 months



Loan Defaulters by State Analysis

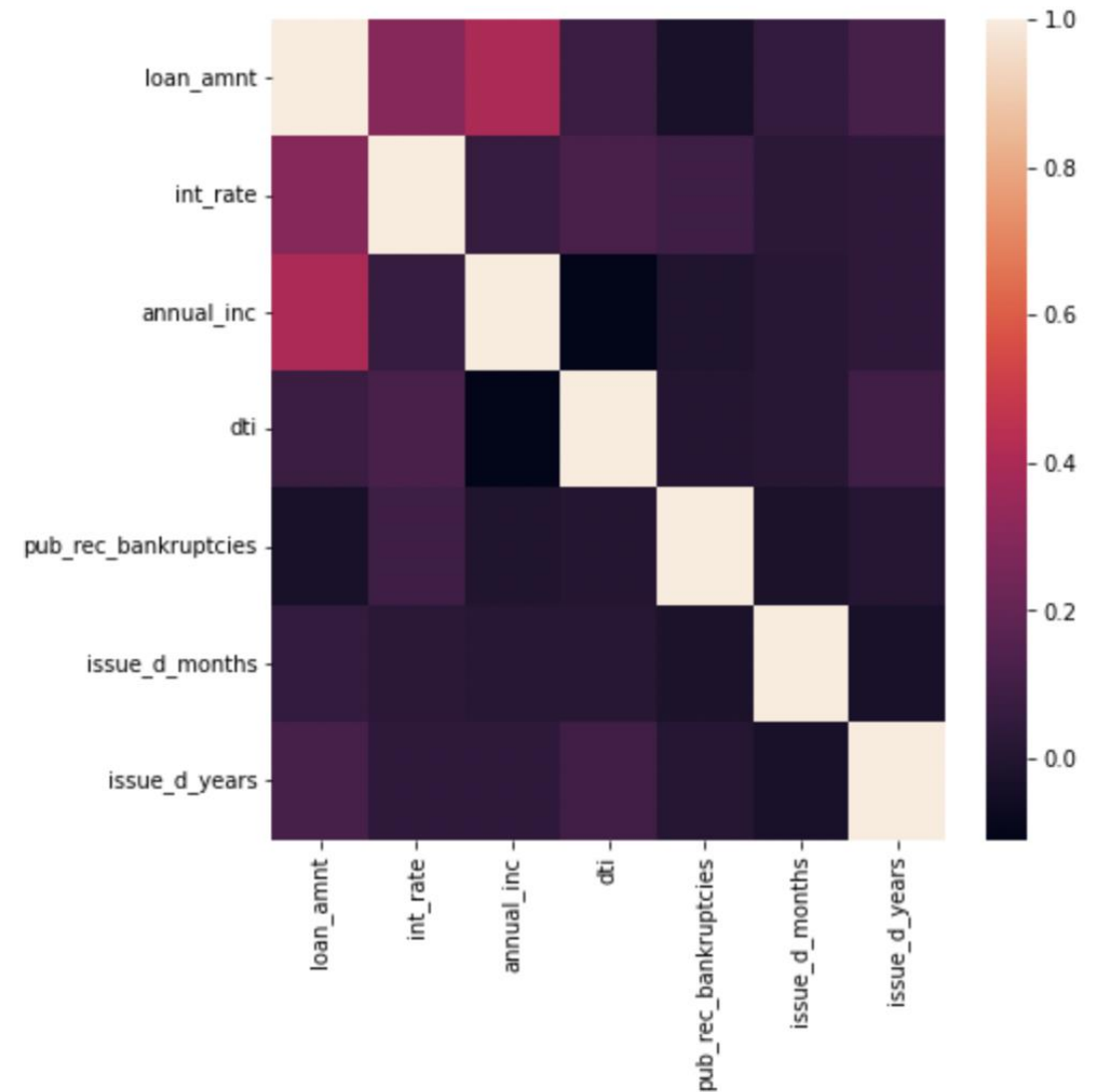
- **Observations :**
- More defaulters are from the state 'CA'



Correlation of Continuous Variables Analysis

Observations :

- Loan amount and annual income are slightly correlated
- Interest rate and loan amount are slightly correlated



Conclusion

Findings :

- Low grade loans have high tendency to default
- Check the Debt To Income values of applicants so that it is not too high
- More applicants tend to default from CA state
- For debt consolidation loans, verify applicant's background thoroughly

