Gramener

Case Study

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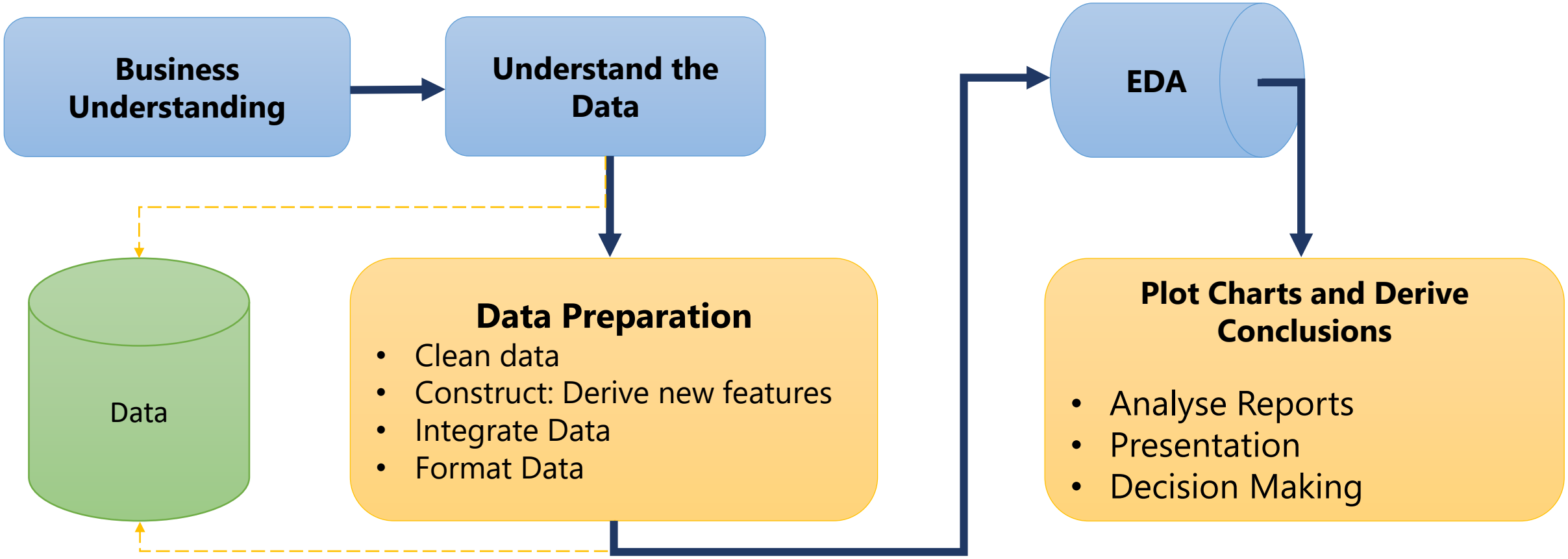
Business Objective

Two types of risks are associated with the bank's decision to provide loan to the applicants:

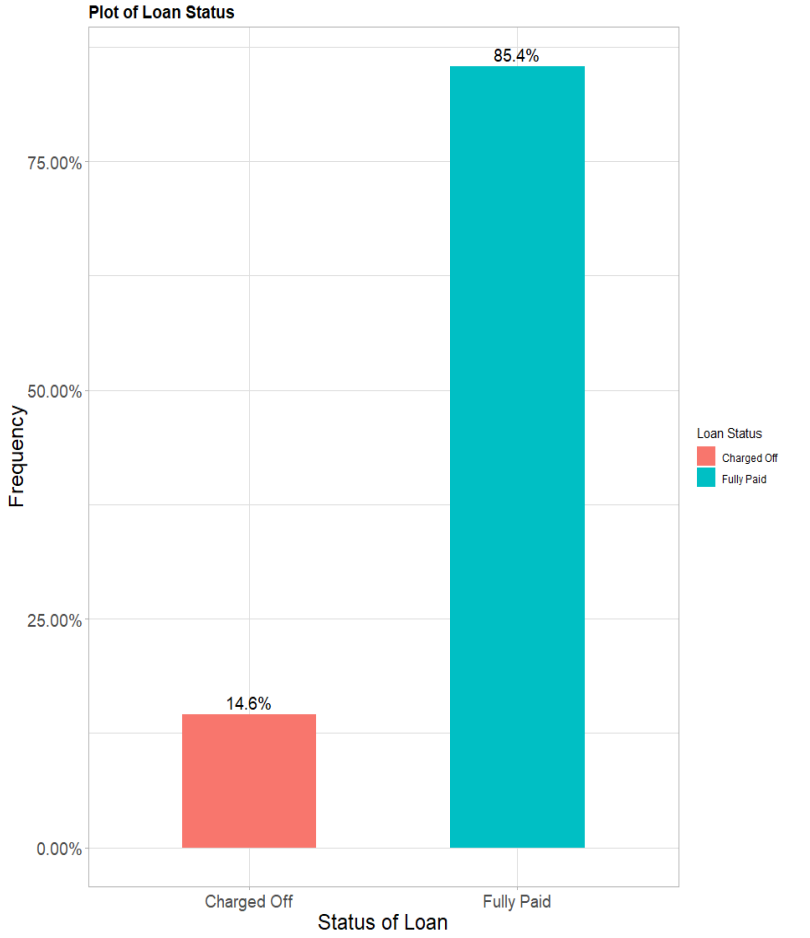
- If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company.
- If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss to the Lending Company.

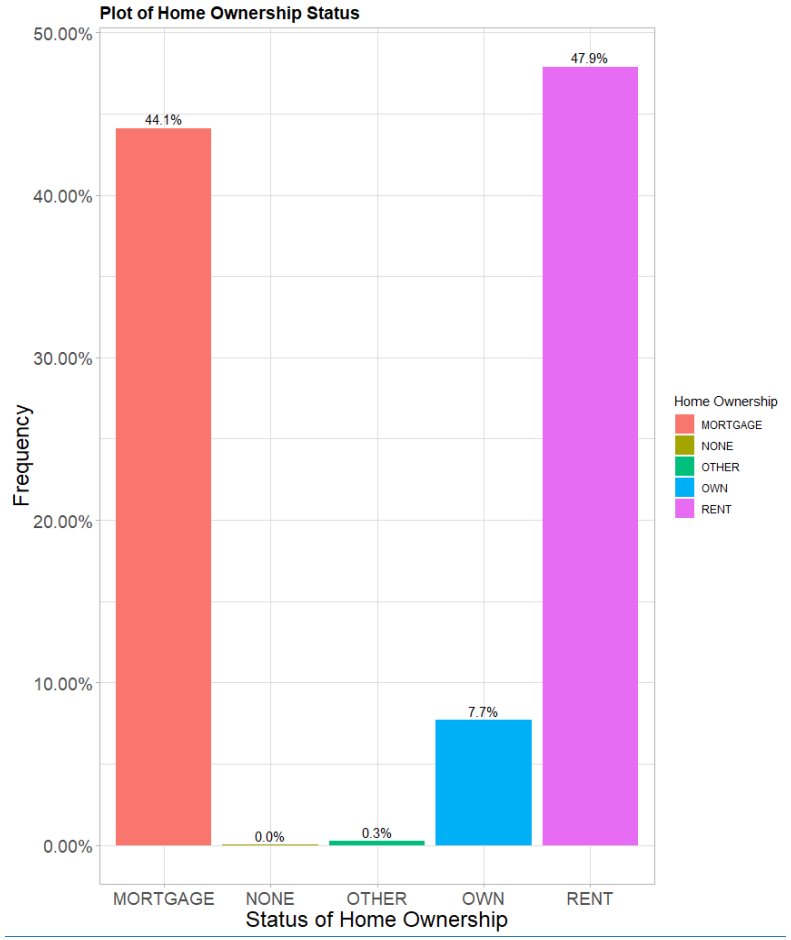
The aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

Problem Solving Methodology



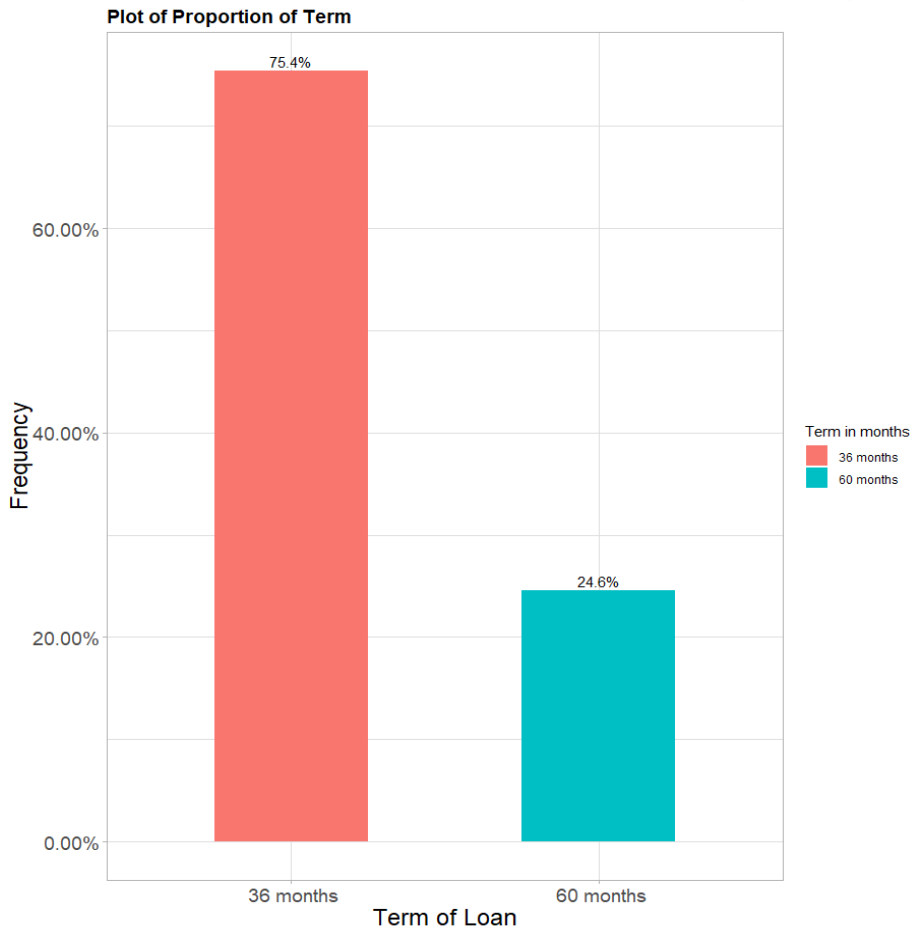
Univariate Analysis

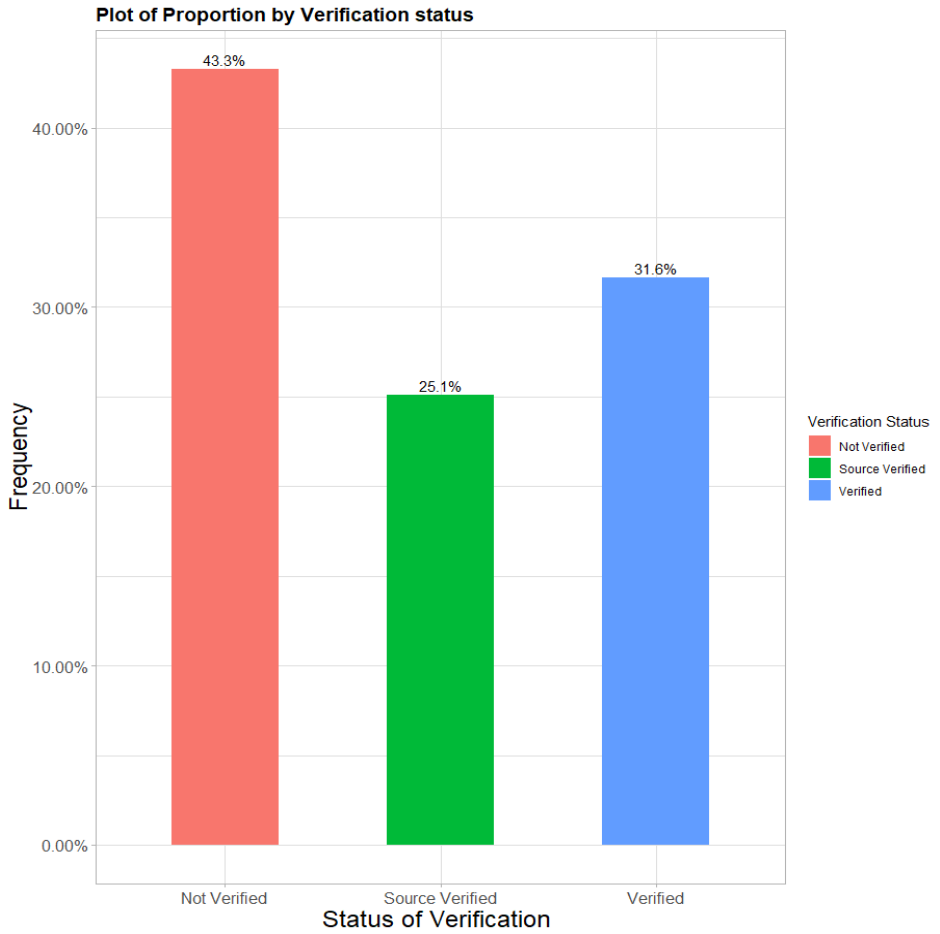




- Around 14.8% of the applicants have Charged off i.e., they have defaulted.
- Most of the applicants are either living in mortgaged or rented houses.

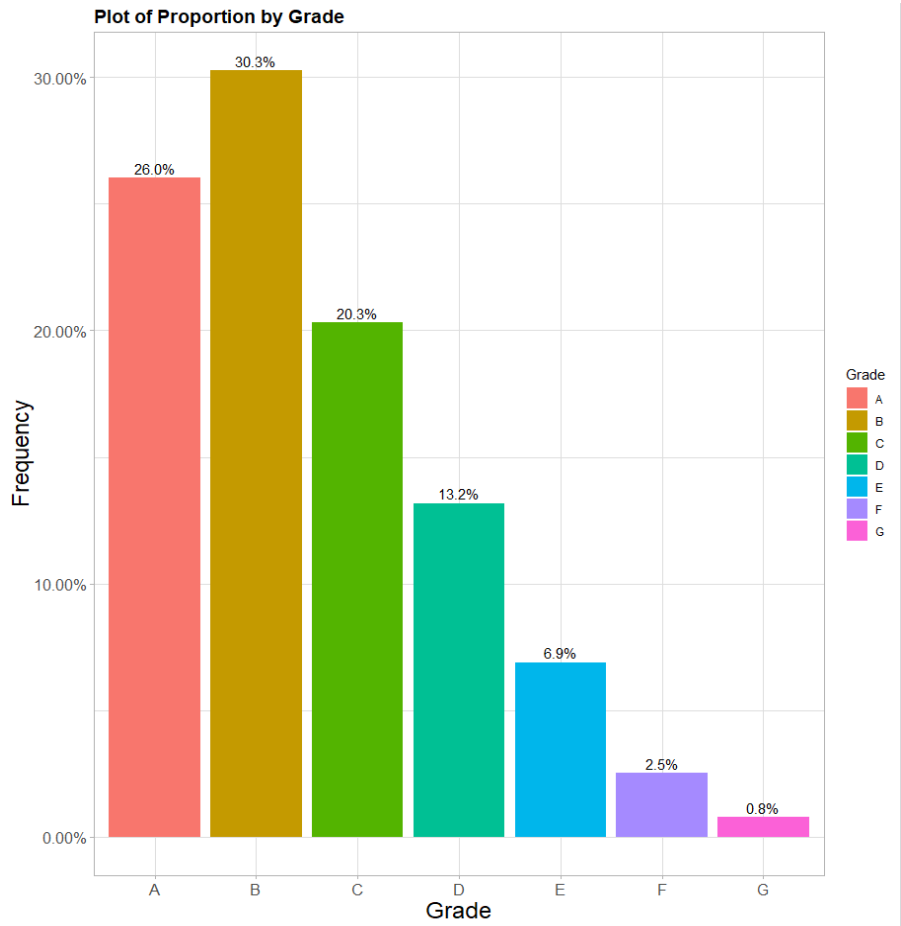
Univariate Analysis

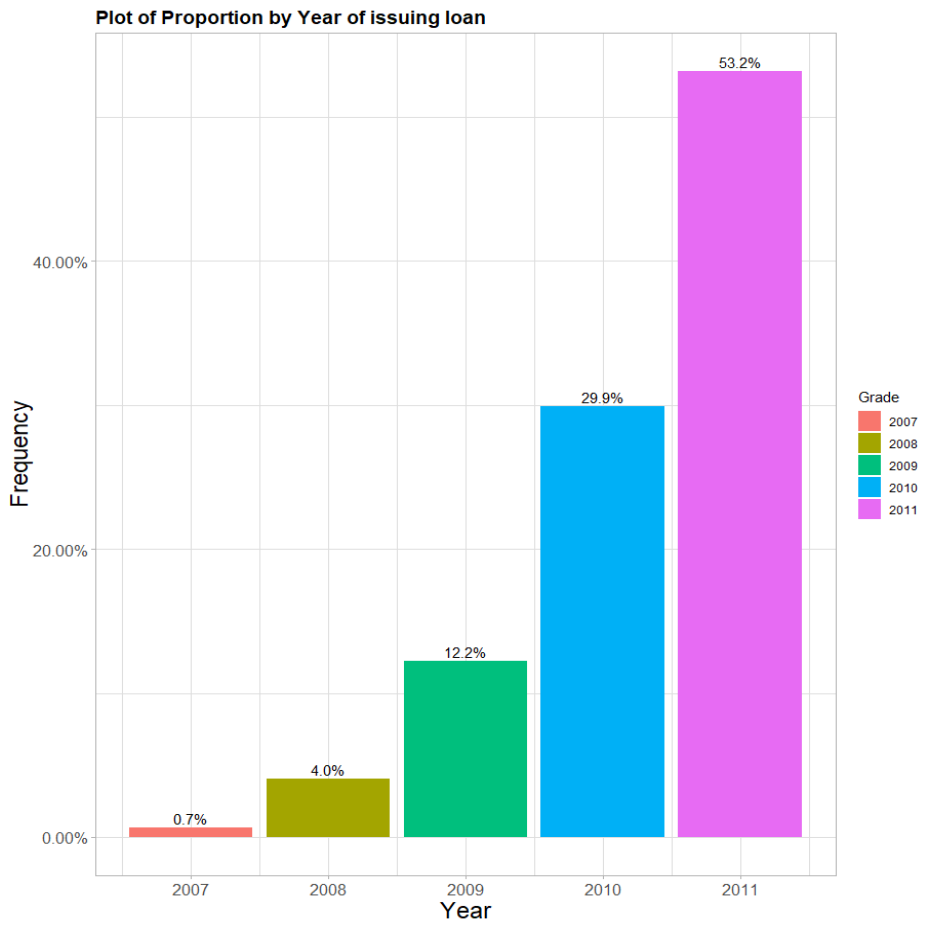




- Most of the loan applications (around 75.4%) are for 36 months tenure.
- Most of the loan applications (around 43.3%) are not verified and the loans are given without the verification process getting completed.

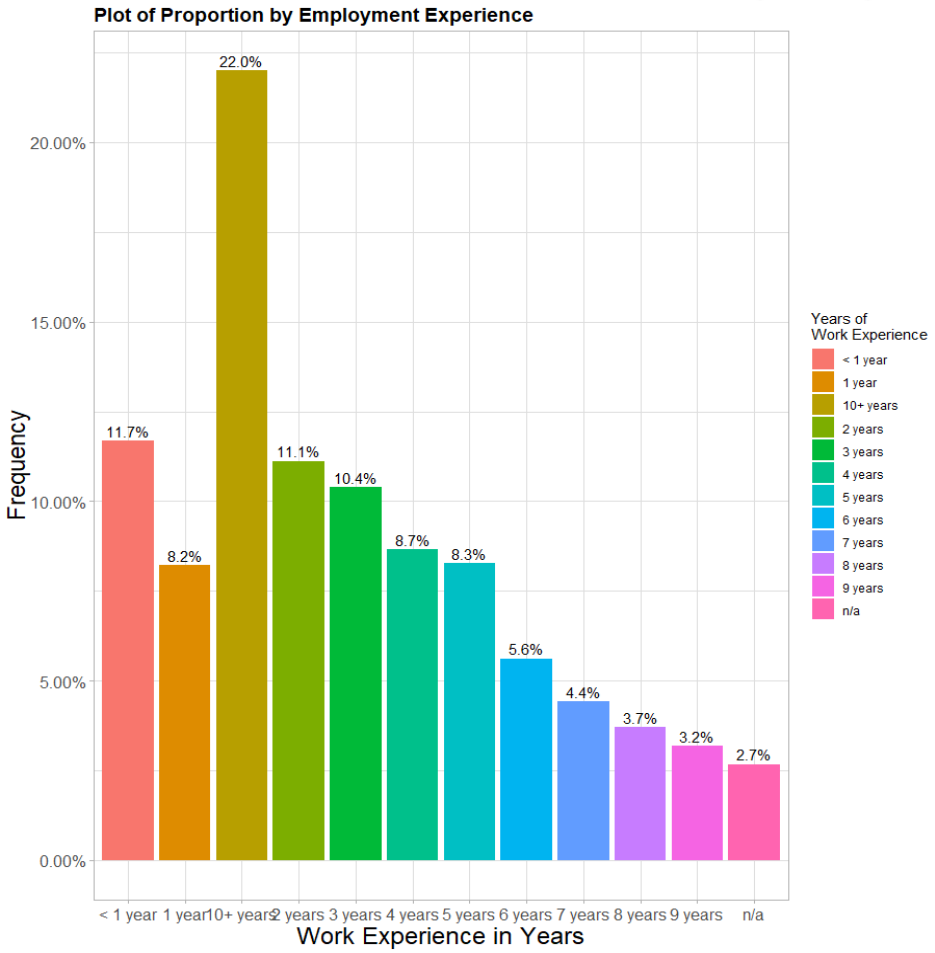
Univariate Analysis

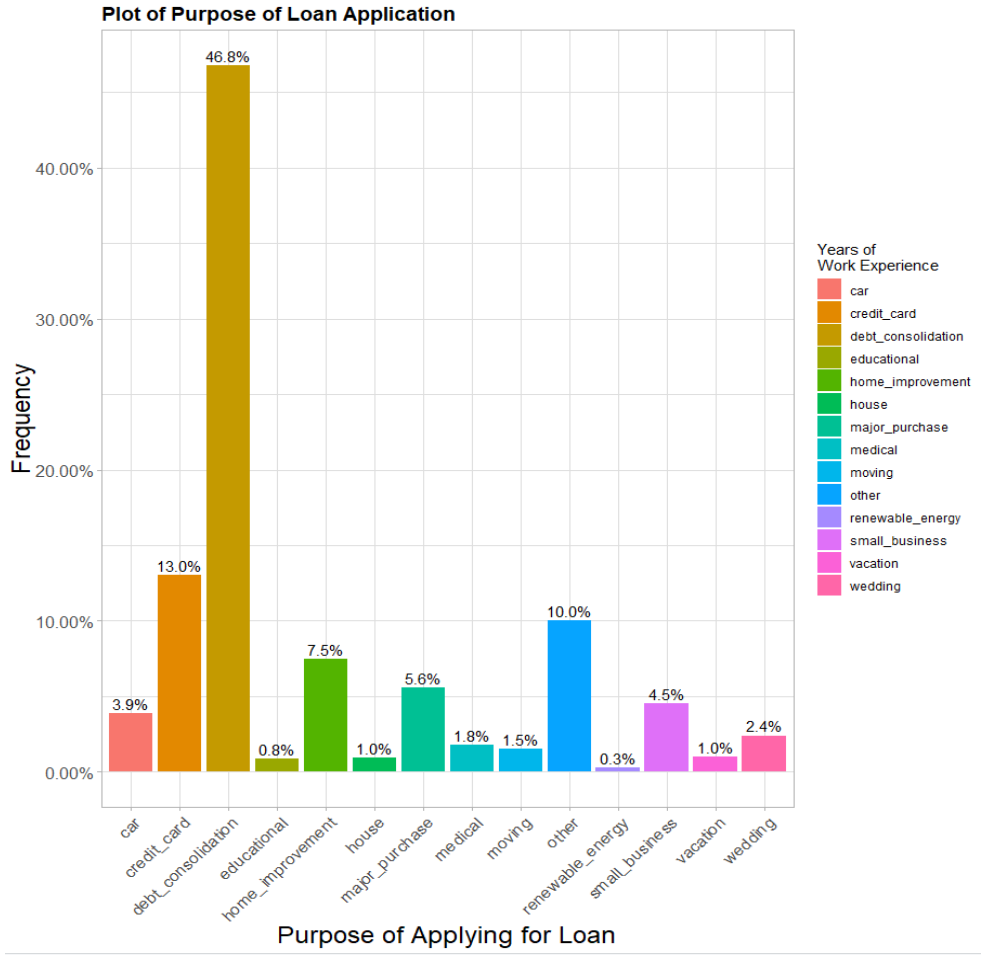




- Grade B is having the highest number of loans, followed by Grade A, and the number decreases continuously from grade C all the way to grade F.
- There is a considerable increase in the number of loan applications from the year 2007 to 2011.

Univariate Analysis

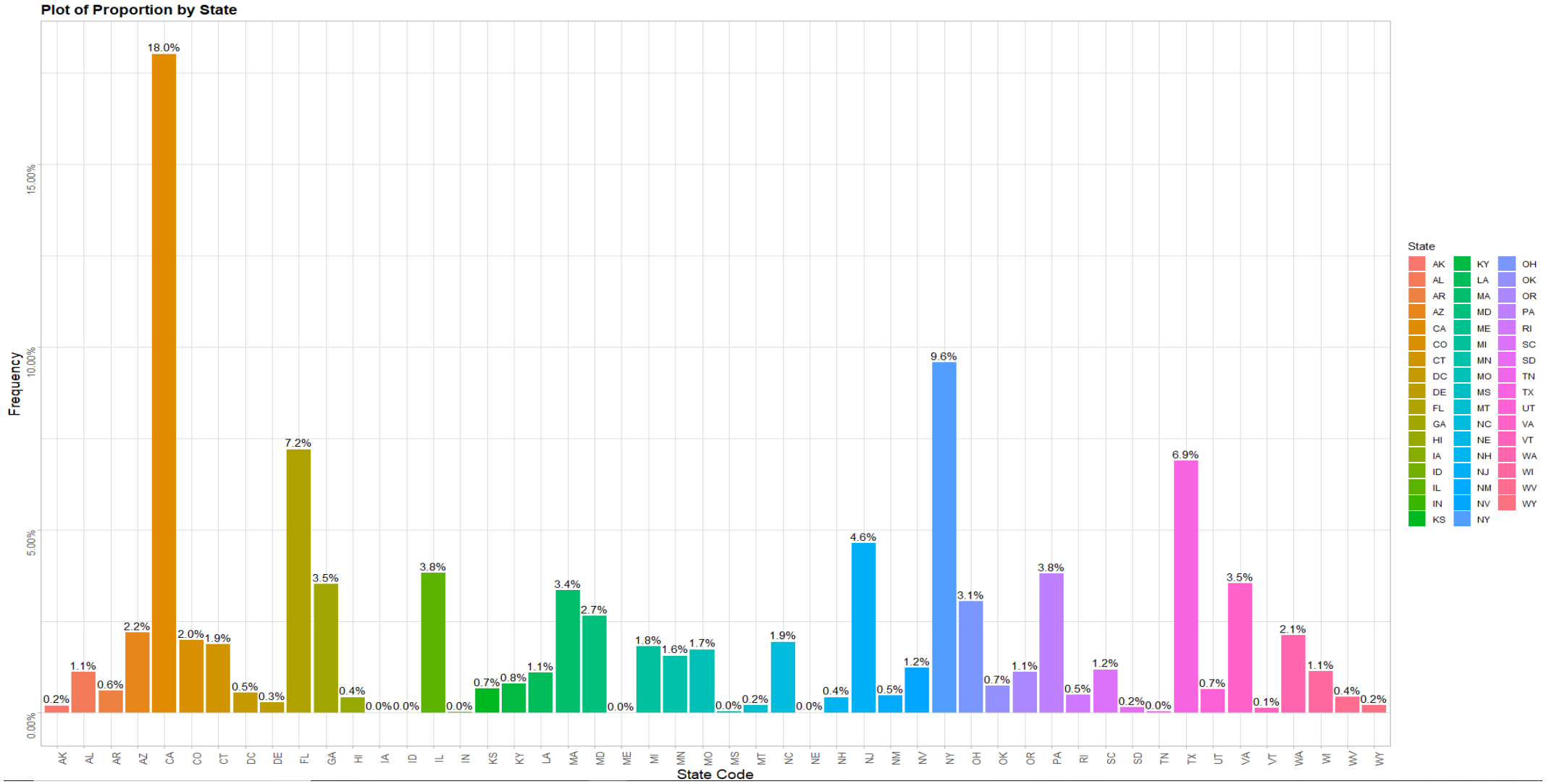




- Borrowers with lesser years of employment experience are the ones who have requested for more loans.

- Loans were mostly applied for the purpose of debt-consolidation, credit card, other, home improvement, major purchases.

Univariate Analysis

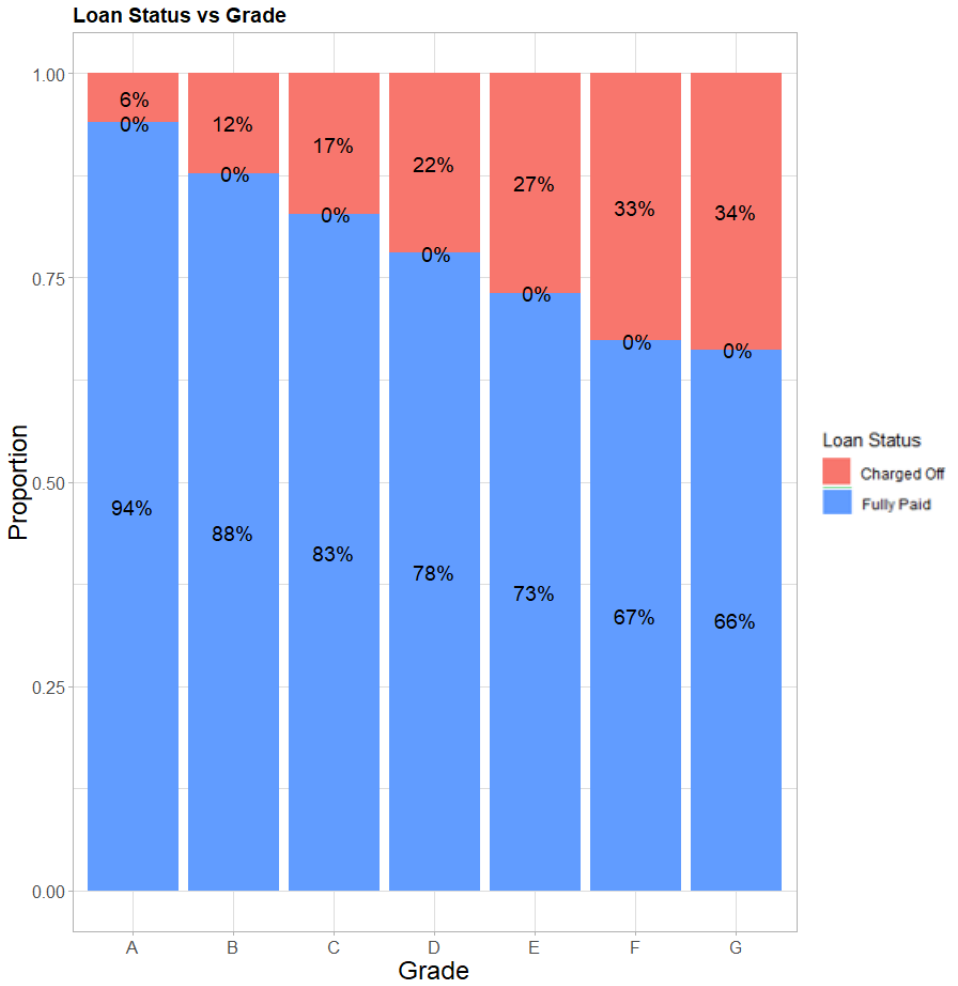


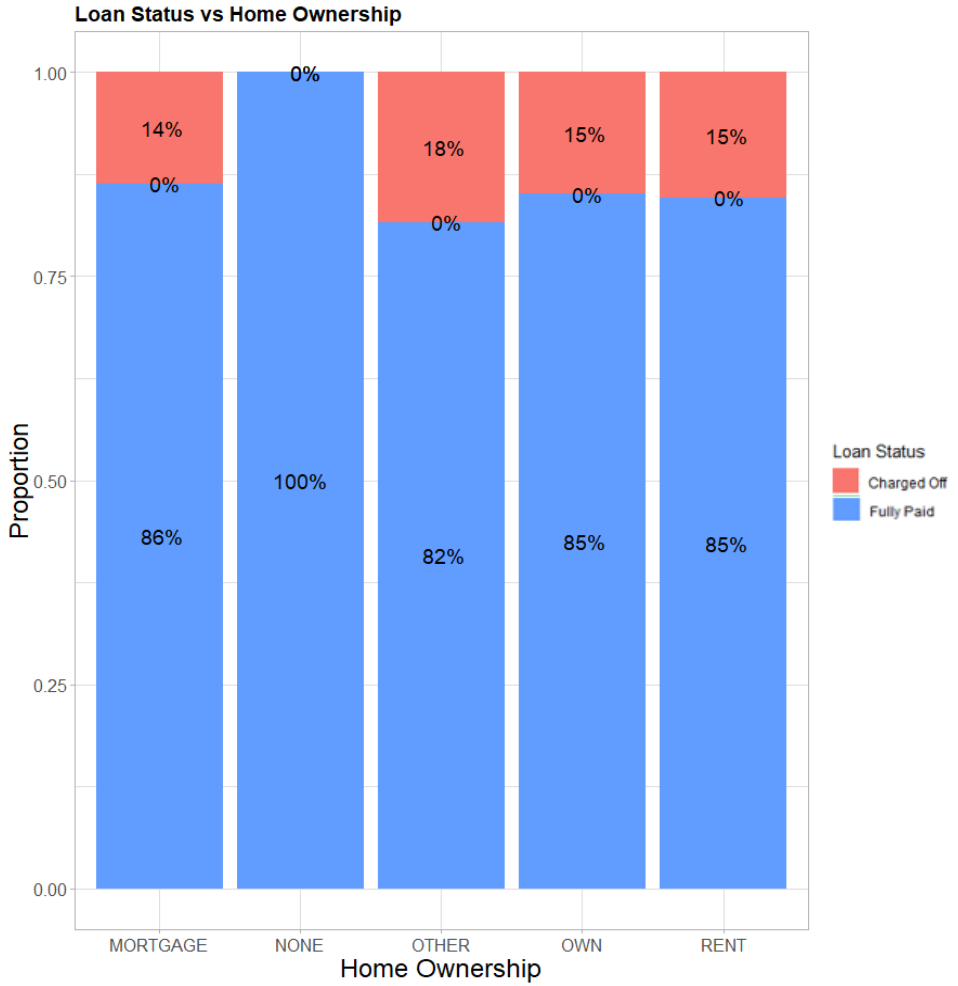
➢Around 44% of the applicants are from the following states: 'CA', 'NY', "FL' , 'TX' and 'NJ'.

Univariate Analysis: Observations

- There are 14.6% applicants who have defaulted on the loan as per the data. We can say that 1 out of 7 cases are Charged Off.
- Majority of the borrowers (around 92%) are either living in Mortgaged(44.10%) or Rented houses(47.90%).
- Majority of the loan applications (around 75%) are for 36 months tenure.
- In around 43% of the cases, borrower's income is not verified.
- Grade B is having the highest number of loans, followed by Grade A, and the number decreases continuously from grade C all the way to grade F.
- There is a considerable increase in the number of loan applications from the year 2007 to 2011.
- Highest number of loans are issued in the year 2011 (around 54.50%).
- Most of the applicants(46.90%) are applying for loan for debt consolidation purpose, followed by credit card(12.90%).
- The number of applications for loan are higher with the people having lesser years of experience and decreases as the years of experience increases. Note: The value in 10+ years of experience is more because the number of applications are spread over a larger group of people.
- Loans were mostly applied for the purpose of debt-consolidation, credit card, other, home improvement, major purchases.
- Around 44% of the applicants are from the following states: 'CA', 'NY', "FL' , 'TX' and 'NJ'.

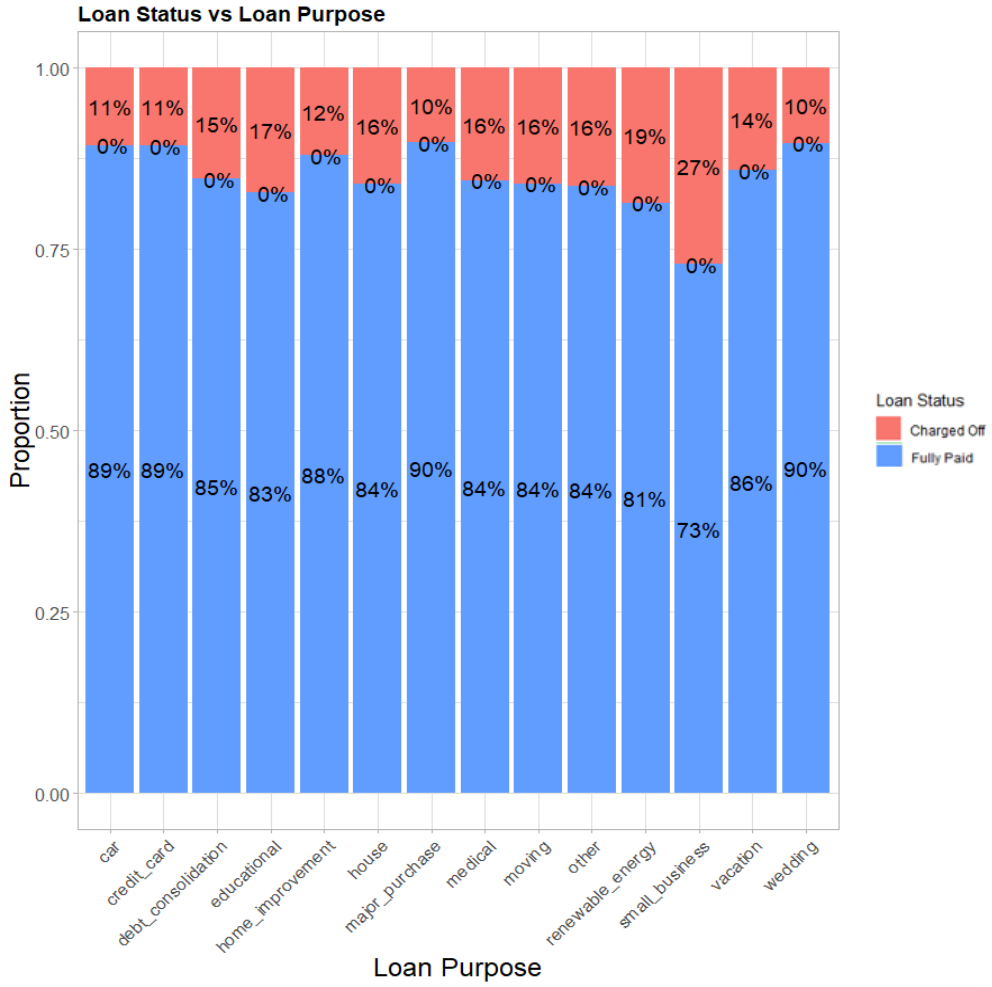
Bivariate Analysis

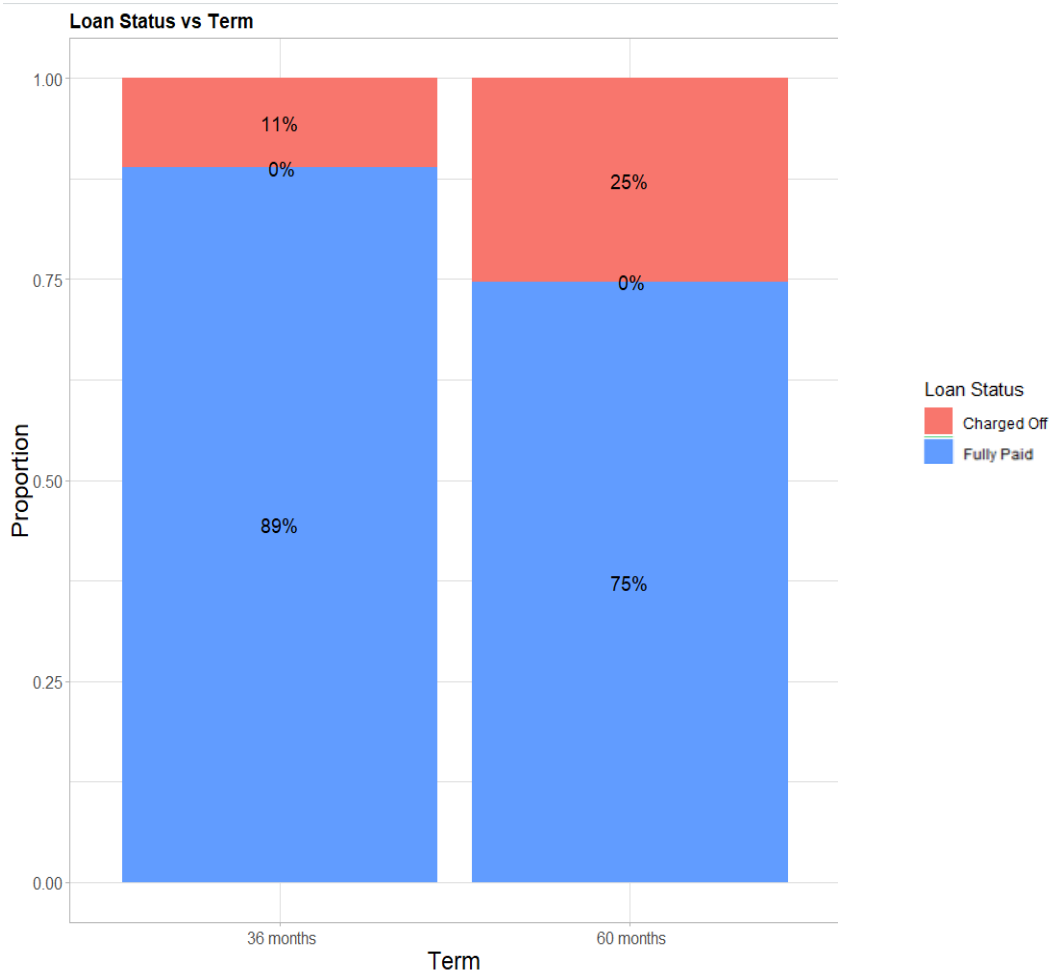




- The proportion of fully paid loans seems to decrease with a change of grade from A to G. 94% of A grade loans are fully paid. This percentage gradually lowers down to 66% as we go down the grade from Grade A to Grade G.
- This plot shows us the distribution of loan status across different applicants with different home ownership statuses. We do not get any concrete idea / useful pattern from this plot,

Bivariate Analysis

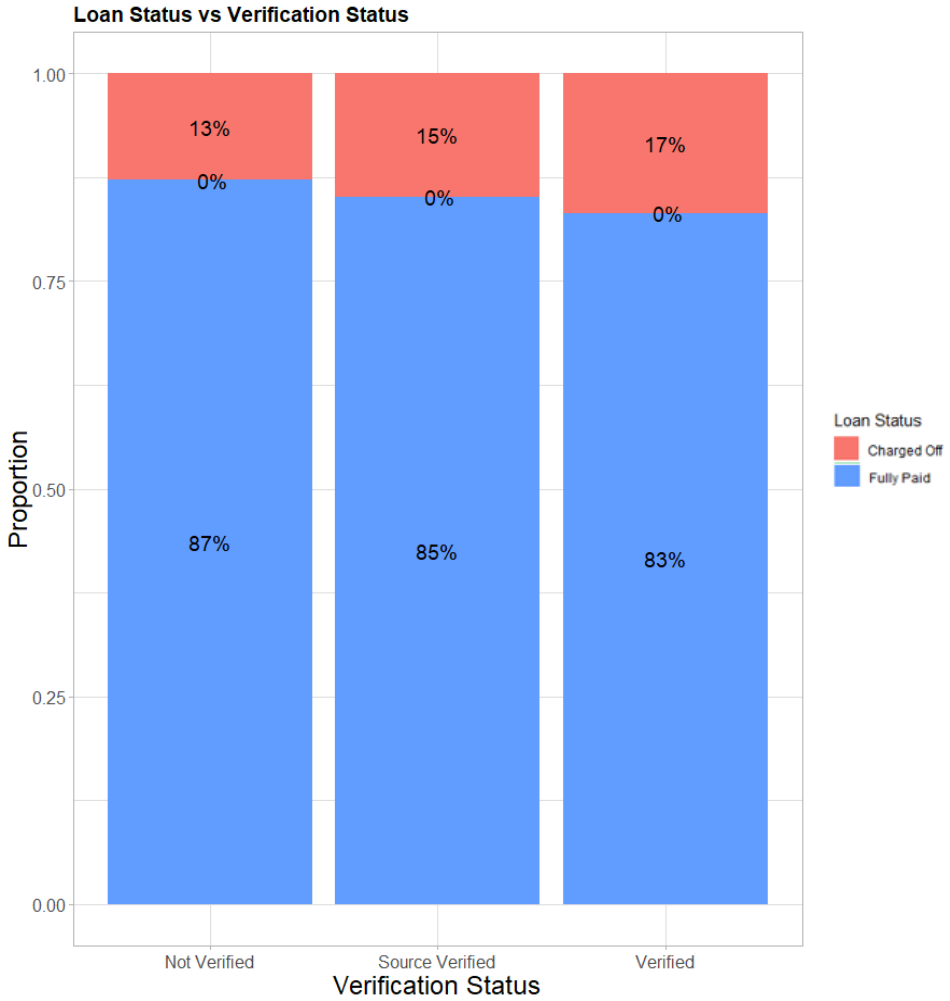




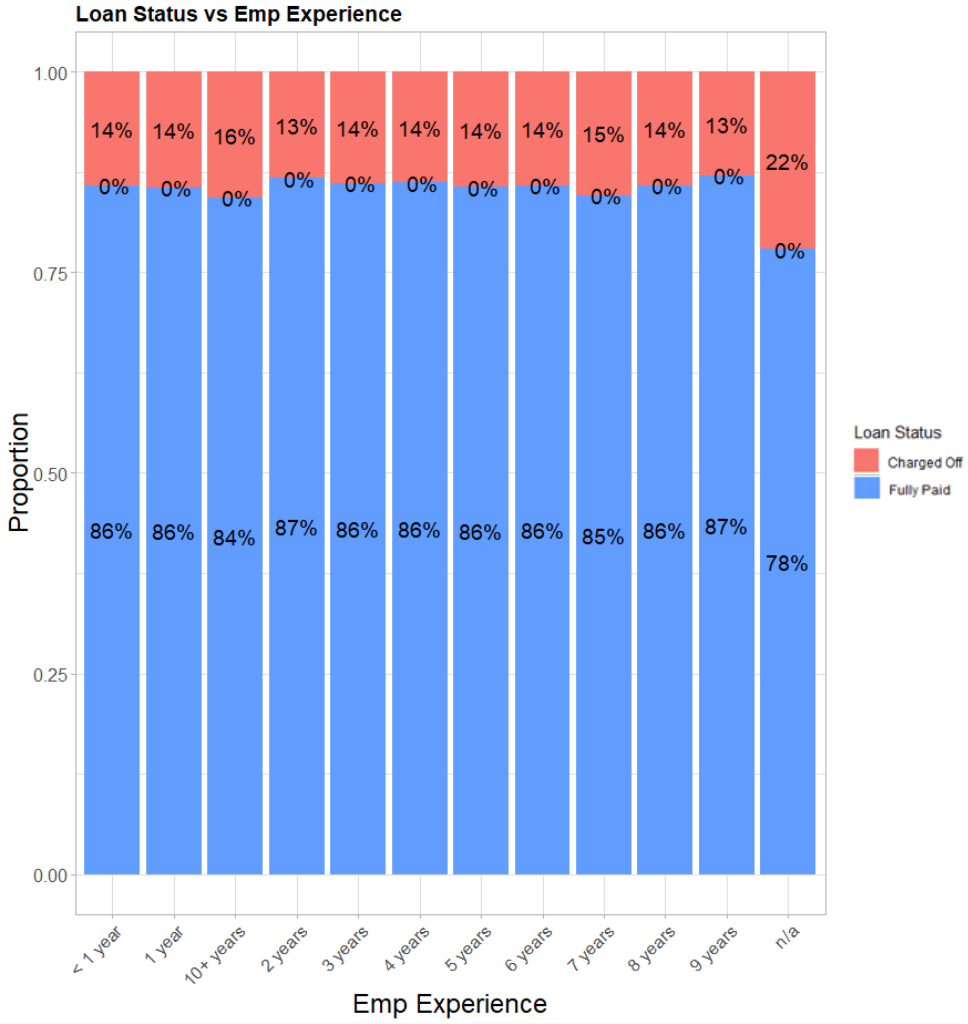
- Higher risk of defaulting for applicants with purpose of small business (around 27%), followed by renewable energy (around 19%) and educational purpose (around 17%). Wedding and major purchase show lesser risk of defaulting at around 10% each.

- More risk of defaulting in the loan applicants with the tenure of 60 months(around 25%). The risk is less in the loan applications for the tenure of 36 months.

Bivariate Analysis



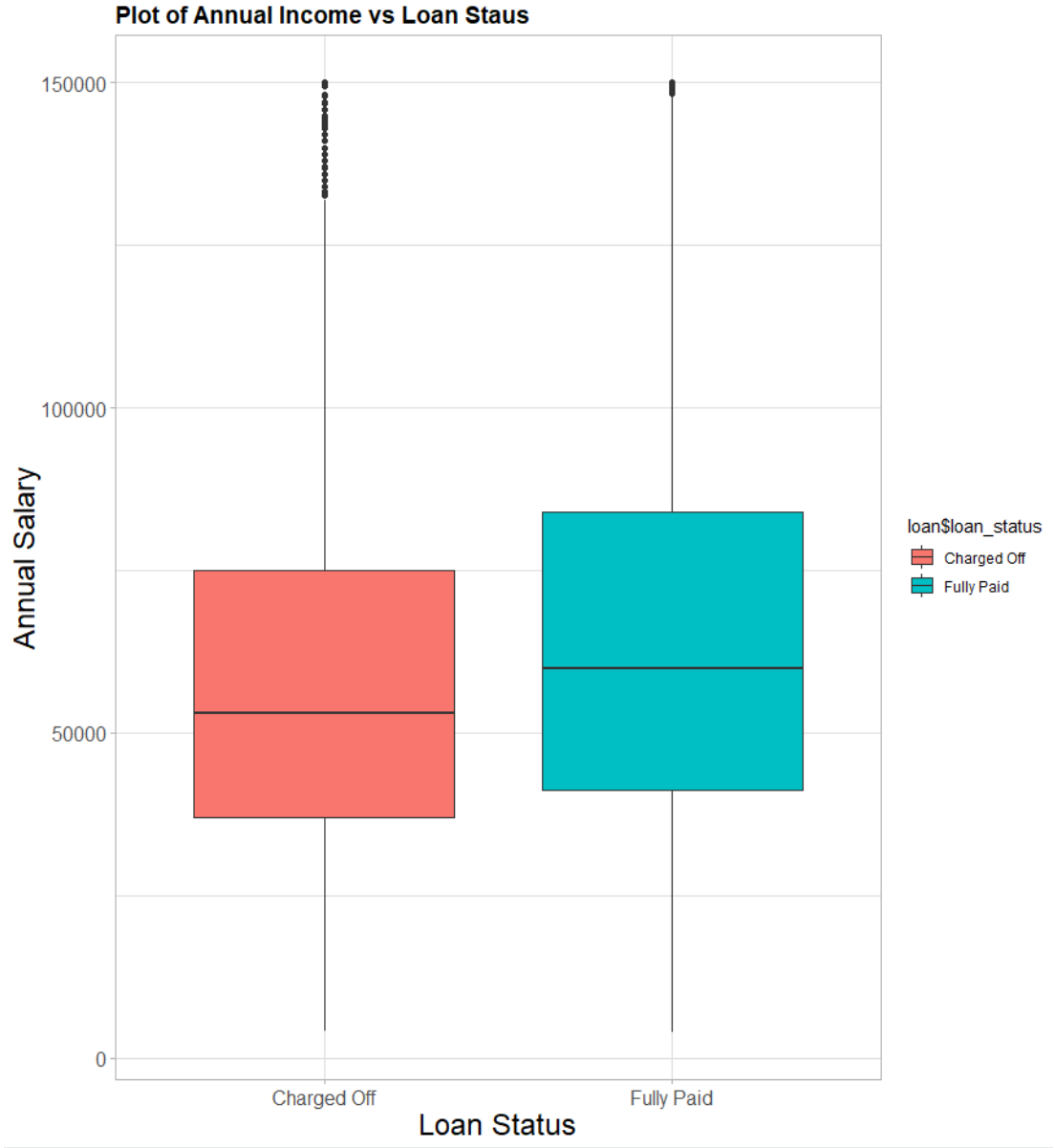
- The number of defaulters are almost equally distributed among all the three categories of verification. So we can't infer any useful insight from this plot.



- Though the number of applicants are higher in the lower number of experience section, the distribution of defaulters is almost same across all the work experience groups.

Bivariate Analysis

- There are certain number of applicants whose salary is way too much as compared to the overall annual salary mean.
- These values are knows as outliers and we have to handle them for our analysis.
- Applicants having higher salary tend to fully pay their loans without defaulting.
- For the overall number of applicants, there are higher number of defaulters who have relatively lesser annual salary.



Bivariate Analysis: Observations

- The number of defaulters are almost equally distributed among all the three categories of verification. So we can't infer any useful insight from this plot.
- More risk of defaulting in the loan applicants with the tenure of 60 months(around 25%). The risk is less in the loan applications for the tenure of 36 months.
- The number of defaulters are almost equally distributed among all the three categories of verification. So we can't infer any useful insight from this plot.
- Though the number of applicants are higher in the lower number of experience section, the distribution of defaulters is almost same across all the work experience groups.
- There are certain number of applicants whose salary is way too much as compared to the overall annual salary mean.
- These values are knows as outliers and we have to handle them for our analysis.
- Applicants having higher salary tend to fully pay their loans without defaulting.
- For the overall number of applicants, there are higher number of defaulters who have relatively lesser annual salary.
- Defaulting rate is more when the annual income is less.

Conclusions

The analysis shows that following are the strong factors which impact the defaulting rate:

- Loan Purpose
  - Loans for Debt Consolidation and Credit Card make up to around 60% of the total loans. Loans taken for the purpose of Small Business are the riskiest having the highest rate of default.
- Grade
  - There is a direct relation between the grade assigned and the defaulting rate. Around 94% of the A Grade loans were fully paid.
  - This figure gradually reduces as the Grade degrades from A to G.
- Loan Tenure
  - Loans granted for the higher tenure(60 months) are likely to be more risky that the loans granted for lower tenure.
- Employment Experience
  - Applicants having lesser years of employment experience are the ones who take higher number of loans. This is mainly because of the lesser annual salary offered during the initial phase of the career. As the salary increases, the need for taking loan reduces.
- Annual Income
  - Applicants having lesser salary are more likely to default on the loan. The applicants who have fully paid the loans are having higher amount of average annual salary.

Thankyou