Lending Club Case Study

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Objectives

- The aim is to identify patterns which indicate if a person is likely to default. These understandings can 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.

- Primary objective is to use EDA to understand how consumer attributes and loan attributes influence the tendency of default.

- Also to understand the driving factors (or driver variables) behind loan default, i.e. the variables which are strong indicators of default.

- The company can utilize this knowledge for its portfolio and risk assessment.

Problem solving methodology

Data Cleaning

Checking the null value percentage and removing the null valued columns and removing unnecessary columns.

Data Understanding

Working with the Data Dictionary and getting knowledge of all the columns and their domain specific uses

Univariate Analysis

Analyzing various columns, plotting the distributions of these column.

Segmented Univariate Analysis

Analyzing various data columns with respect to the target column

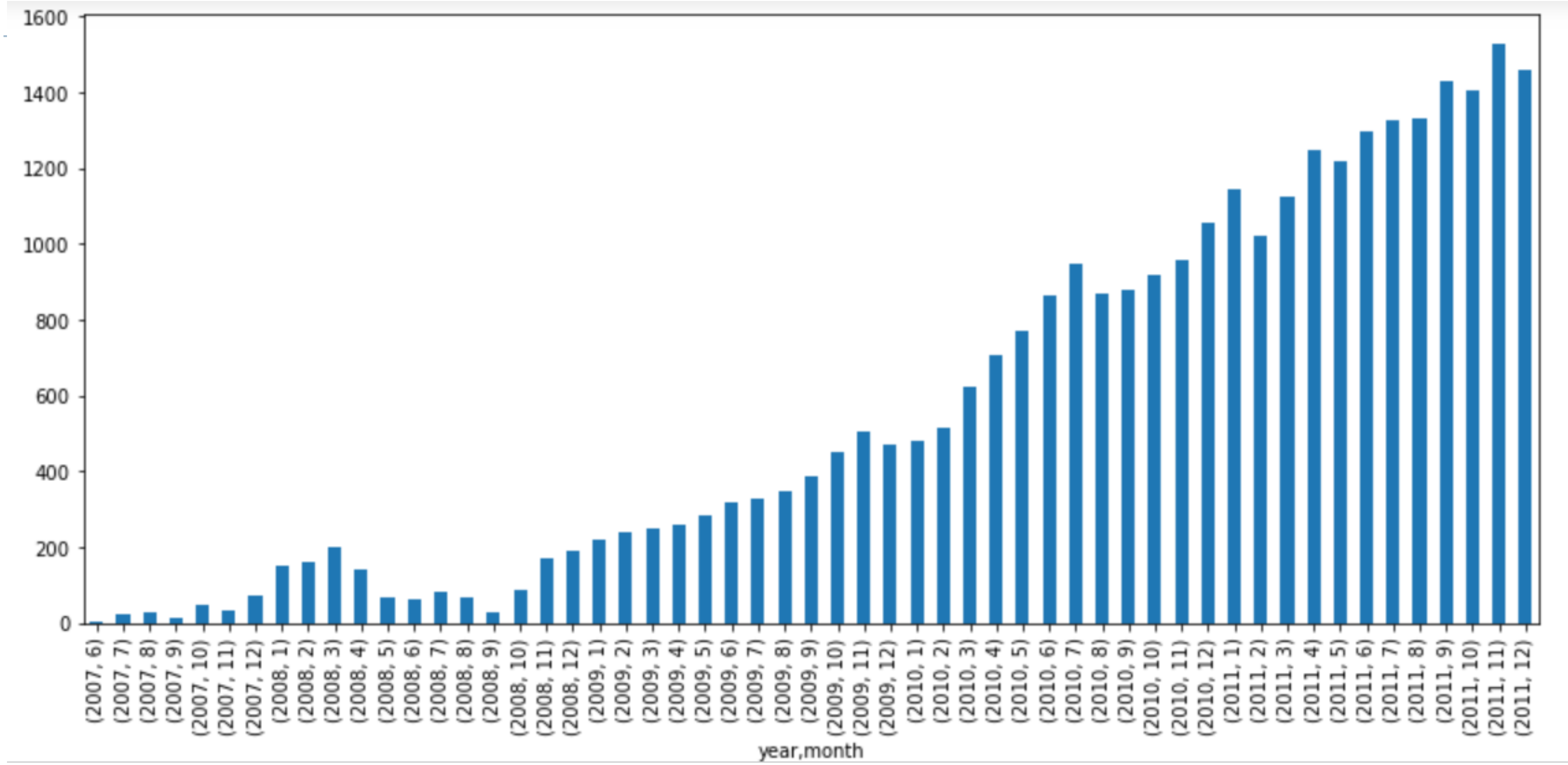
Bivariate Analysis

Analyzing two variables for the purpose of determining the empirical relationship between them.

Recommendations

Analyzing all plots and detecting columns which contribute to loan defaulters.

Year of Loan as driving variable

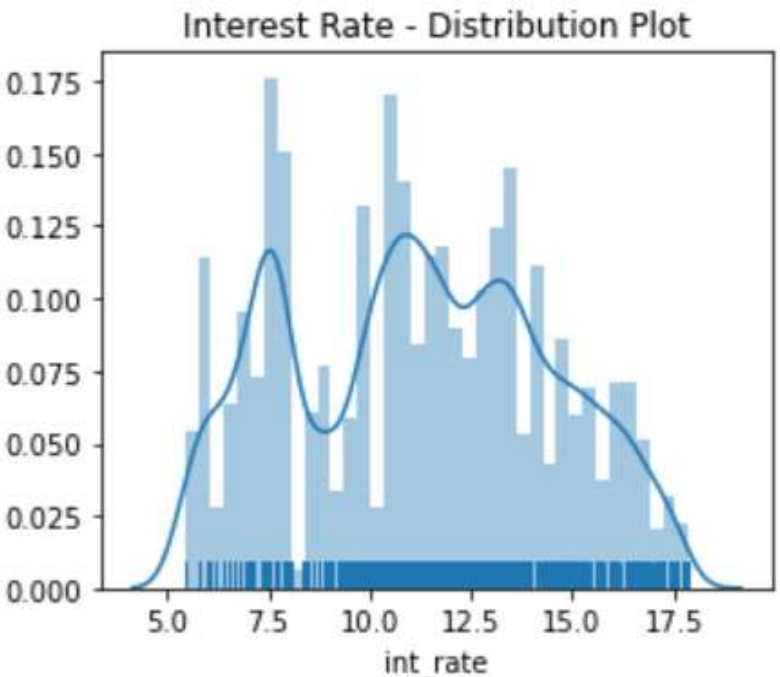


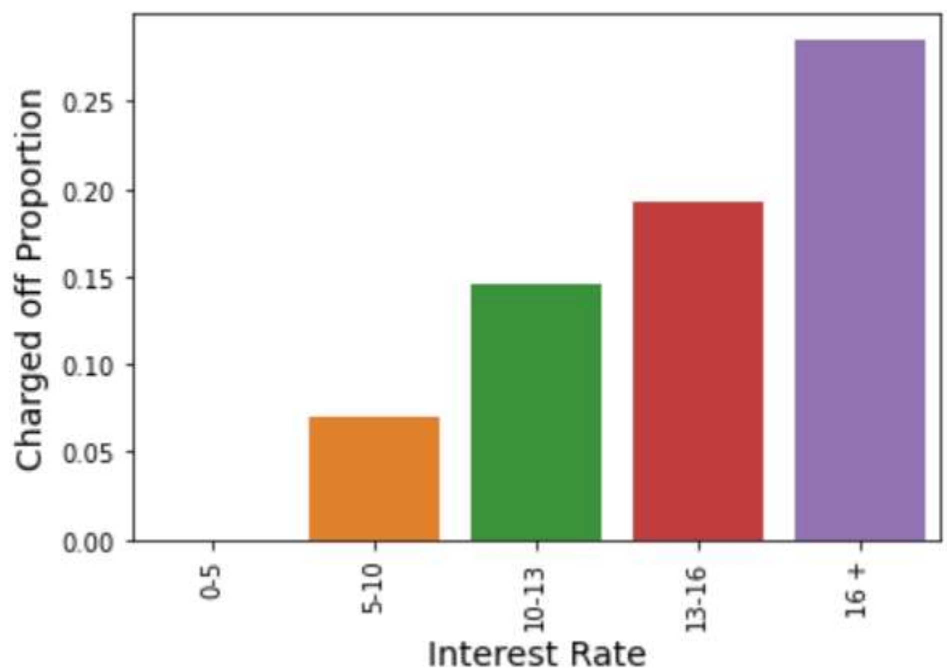
- There is increase in count of loan application with each passing year.
- This observation holds true except for May-October in the year 2008, reason for this can be recession. Hence, increase in number of loan applications may lead to increased number of charged off applications.

Interest rate as driving variable

- Maximum loan applicants have Interest Rates on loans in the range of 10% - 15%

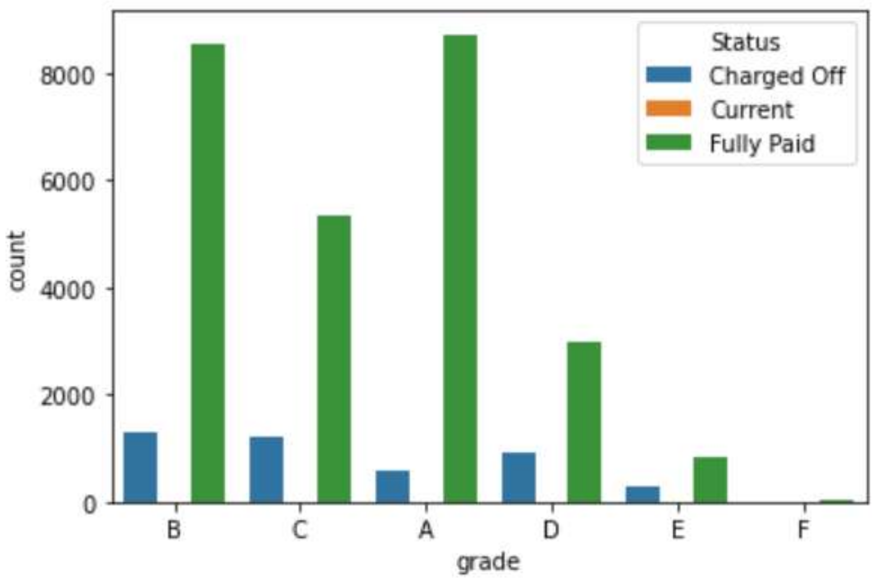
- Charged off proportion increases with increase in interest rates. Interest rate more than 16% has very high chances of charged off.

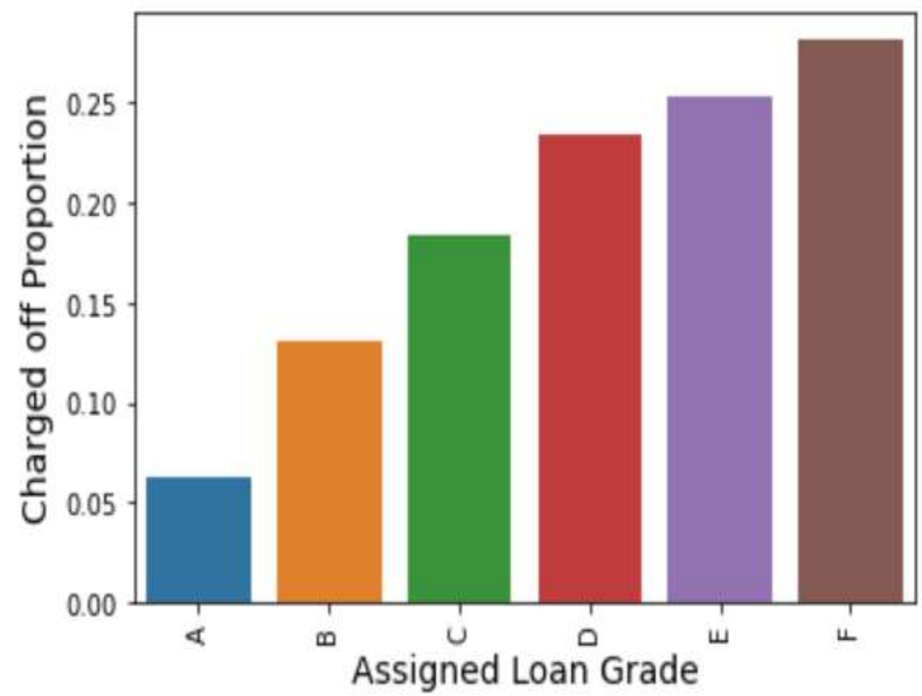




Loan Grade as driving variable

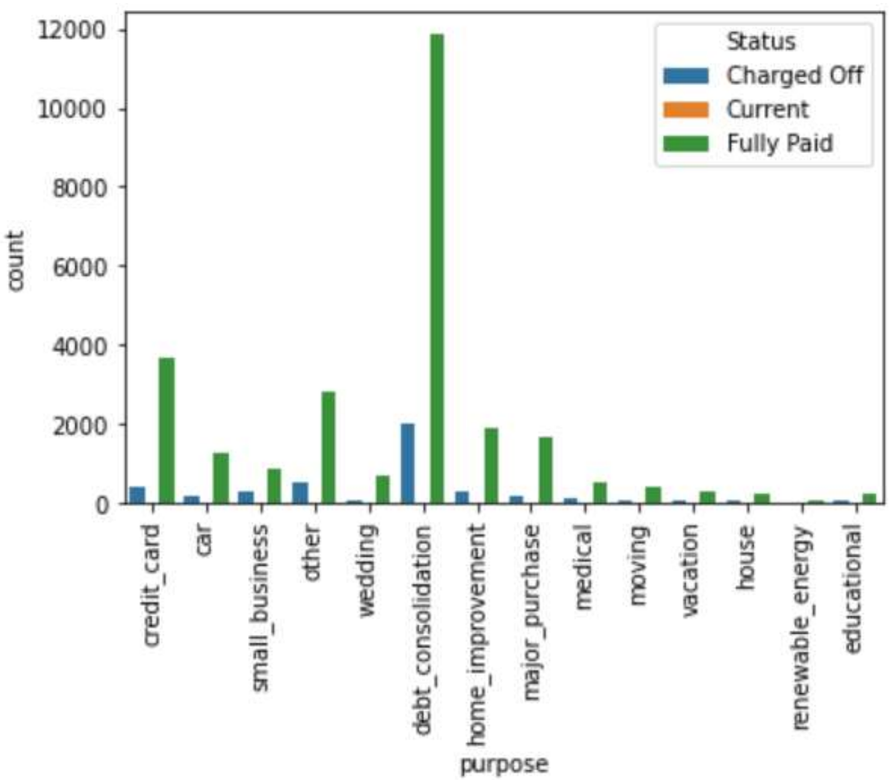
- While loan applications gradually decreases from A to F.
- Proportion of charged off applicants increases with grade moving from "A" towards "F“.

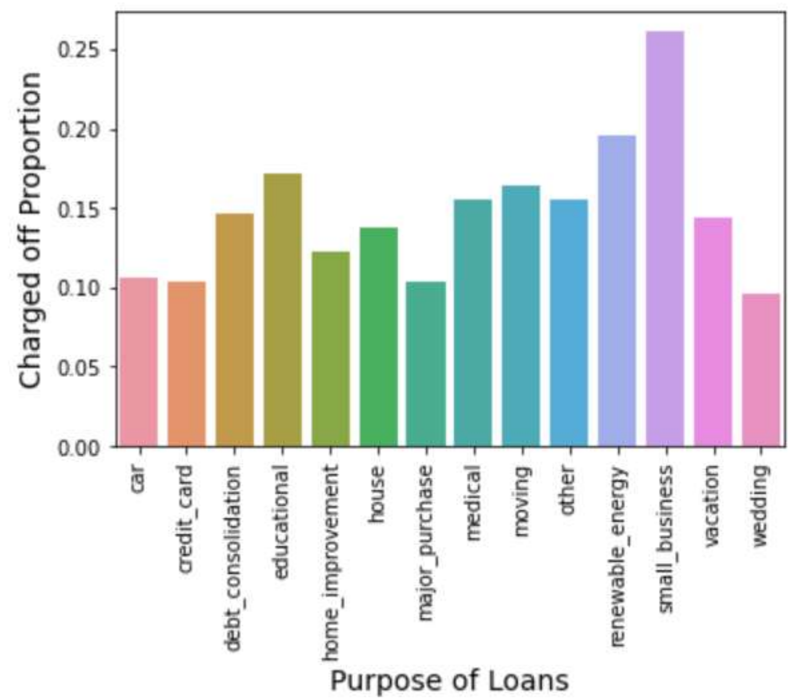




Purpose of Loan as driving variable

- Most of the loans taken for debt consolidation(45.15%) and Credit card bill payment (13.21%). Other (10.8%) is also one of the main area where loans were taken and then the home improvement is another major reason (6.94%)
- "Small Business" applicants have high chances of getting charged off. "Renewable energy" and "educational applicants" are next categories where charge off is high.

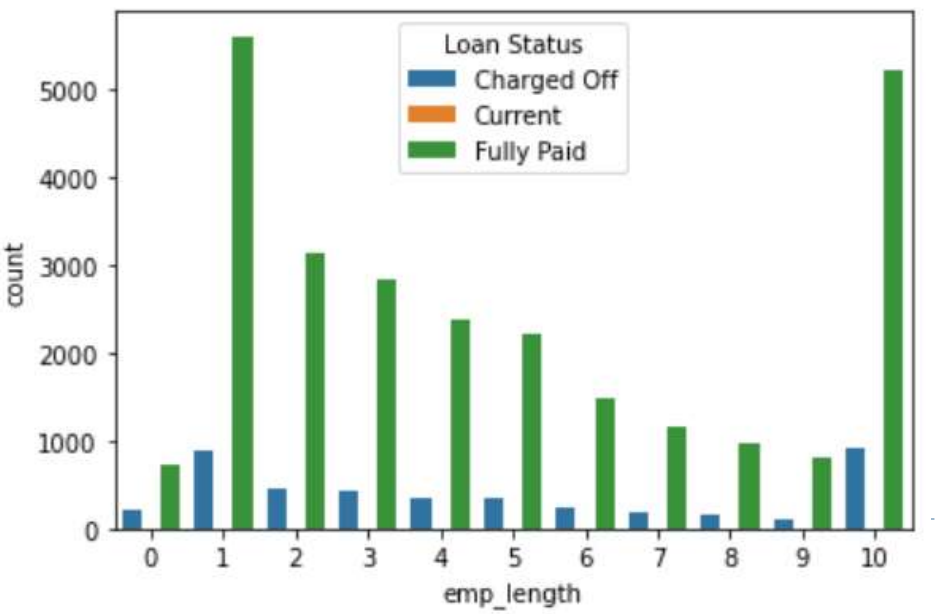


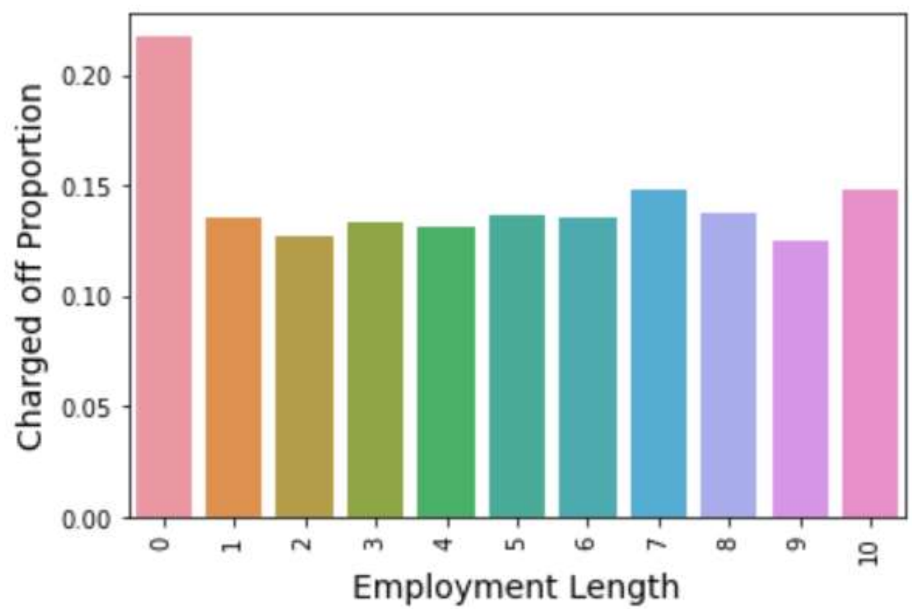


Employment Length as driving variable

- Employment length of less than one year has highest proportion of charged off loan applicants.

- Here, Maximum count of loan applicants are observed for employment length of 1 year, and have maximum defaulters as well.

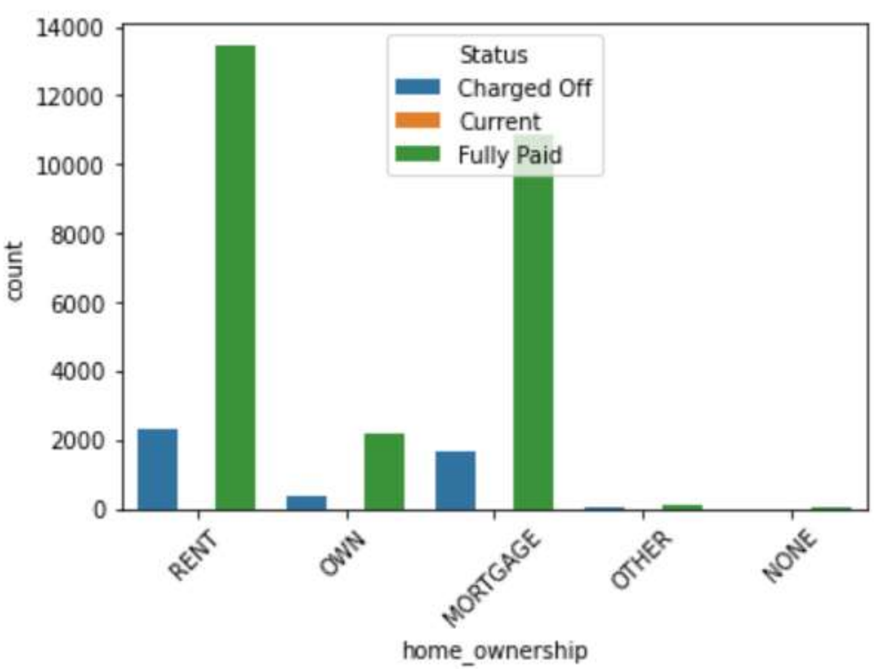


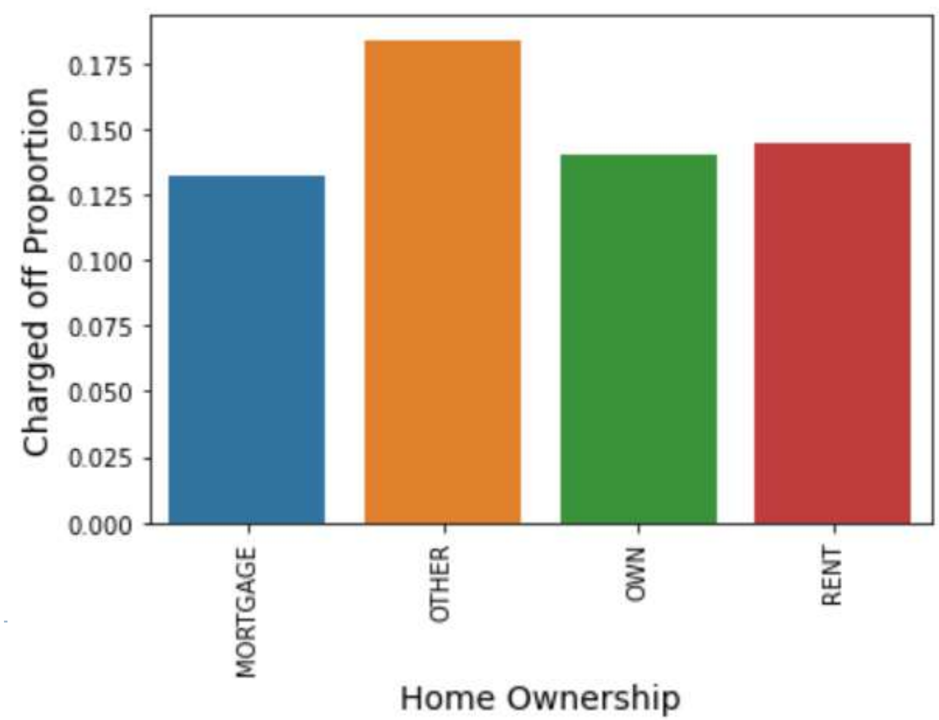


Home Ownership as driving variable

- When home ownership is considered, applicant numbers are highest for those living in rented home. Next highest loan applicants are those who mortgaged their home. While others category have least numbers of applicants.

- But Charge off chances is less in case of mortgaged homes. Charge off chances are high in case of other categories.

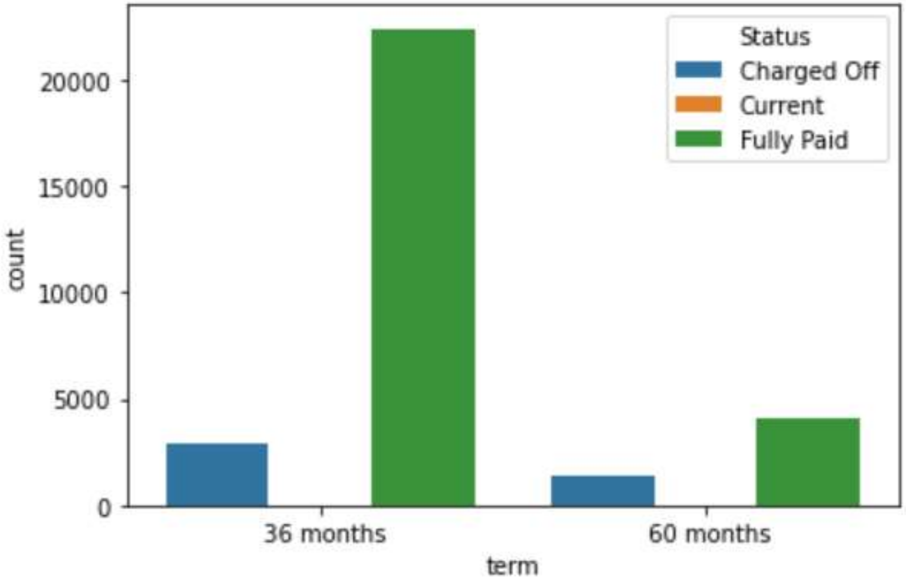


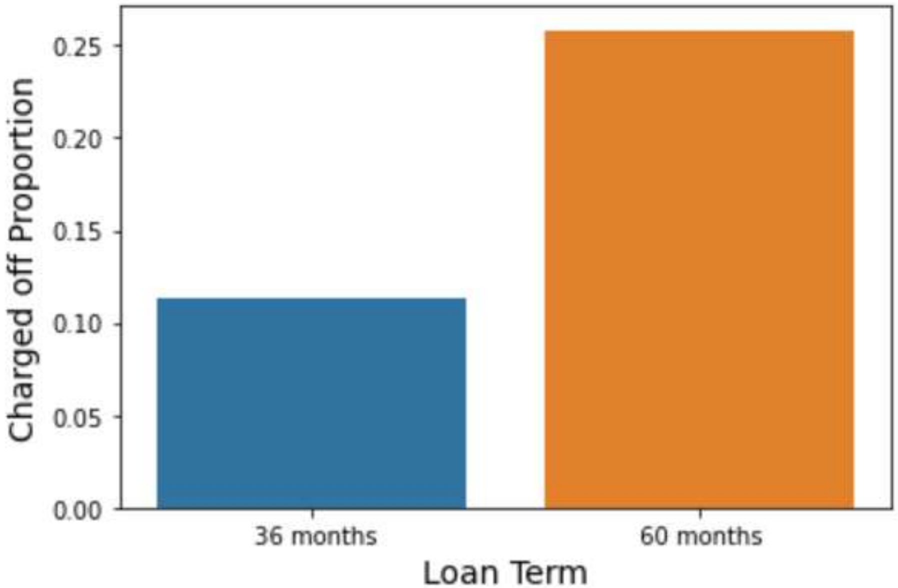


Loan Term as driving Variable

- Charge off applicants numbers are significantly higher in case of 60 months loan term while applicants with loan repayment term of 36 months are higher in count.

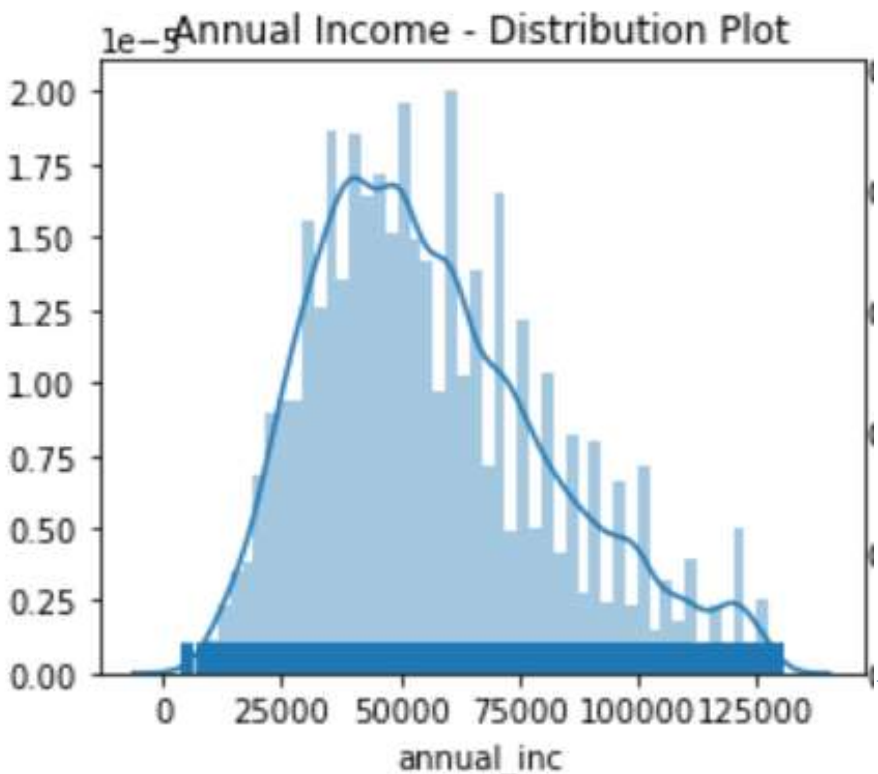
- Interest rate is higher in case of 60 months loan term, leading to increased Charged off applicants.

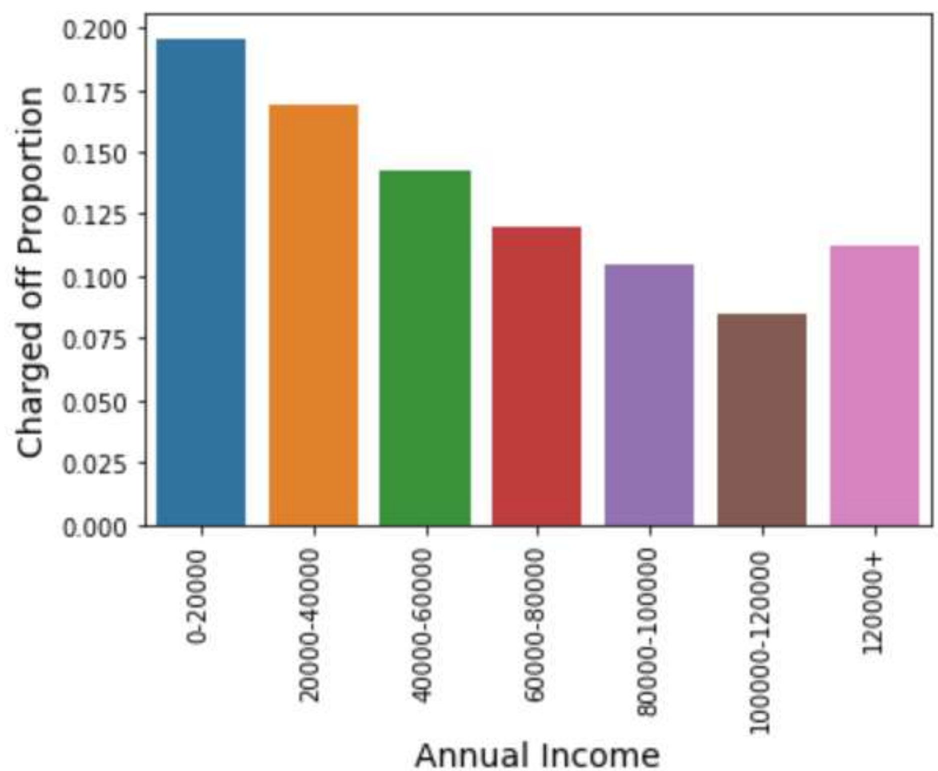




Annual Income as Driving Variable

- Maximum loan applicants have their annual income in range 30000-80000.
- With increase in annual income charged off proportion decreases. Income range (0-20000) has high chances of charged off.





DTI and Public Record Bankruptcies as driving variable

- As DTI (Ratio of total monthly debt payments to total debt obligation) increases chances of charged off applicants increases.

- Higher number of Public Record Bankruptcies results in higher rate of Charged off applicants.