Lending Club Case Study Submission

Team Members:

1. Aakash Mal
2. Preity Rashmi

Objective

This is the case study for a basic understanding of risk analytics in banking and financial services and understand how data is used to minimize the risk of losing money while lending to customers.

Problem Statement:

- We are analyzing the scenario for a consumer finance company which specializes in lending various types of loans to urban customers. There are two types of risks, associated with the bank's decision for approving loan :
- 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 for the company
- When a person applies for a loan, there are two types of decisions that could be taken by the company:
- **Loan accepted**: If the company approves the loan, there are 3 possible scenarios described below:
    - **Fully paid**: Applicant has fully paid the loan (the principal and the interest rate)
    - **Current**: Applicant is in the process of paying the instalments, i.e. the tenure of the loan is not yet completed. These candidates are not labelled as 'defaulted'.
    - **Charged-off**: Applicant has not paid the instalments in due time for a long period of time, i.e. he/she has defaulted on the loan
- **Loan rejected**: The company had rejected the loan (because the candidate does not meet their requirements etc.). Since the loan was rejected, there is no transactional history of those applicants with the company and so this data is not available with the company (and thus in this dataset)

Analysis Approach

- Data Understanding
- Data Cleaning
- Data Analysis
- Insights and Recommendations

Data Understanding

- Understanding the columns, based on the descriptions provided in Data Dictionary.
- Understanding the core concepts of loan
- Understanding the grading system in Lending Club
- Concepts of defaulters (Charged-off)

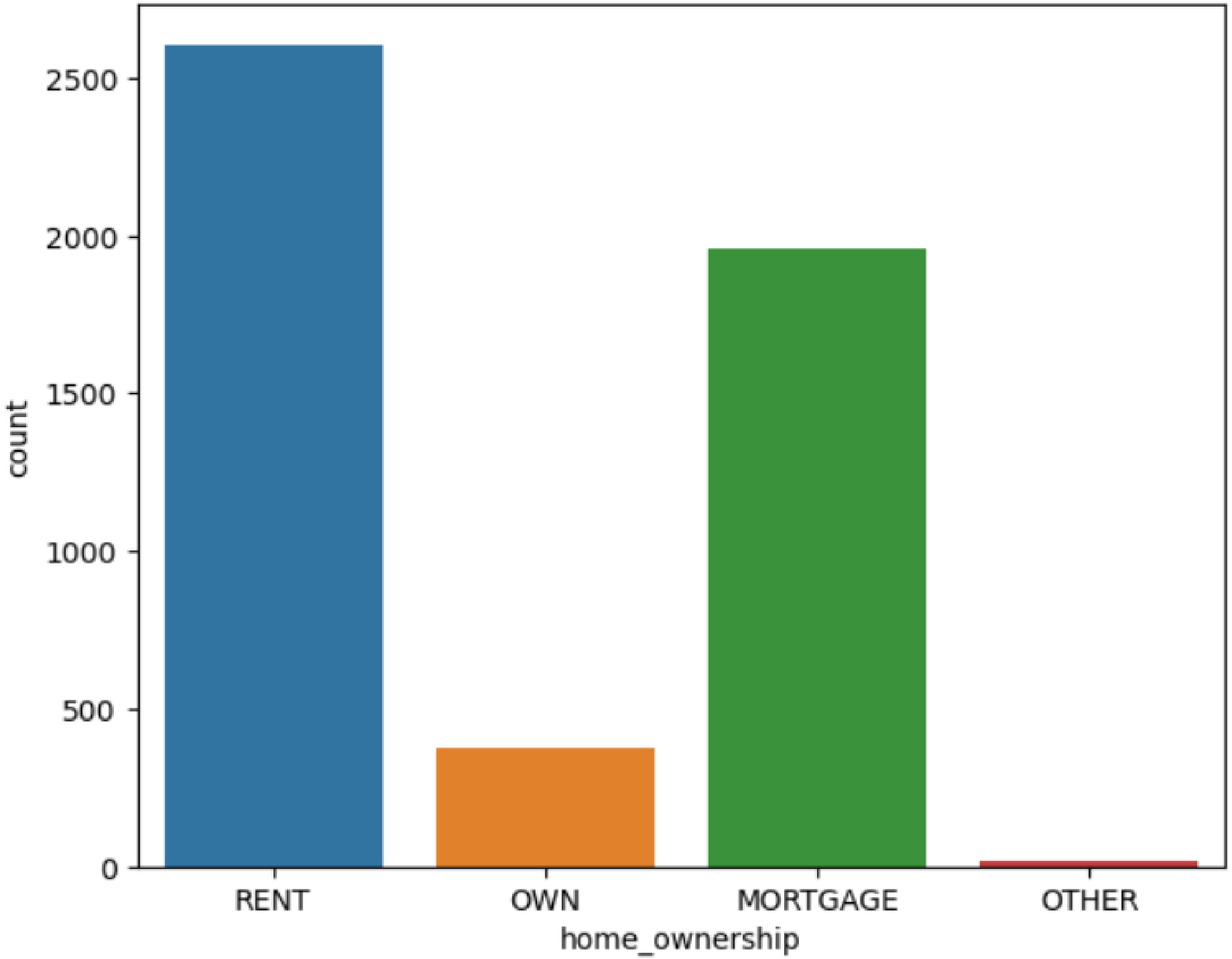
Data Cleaning

- **Remove** — Remove blank columns
- **Remove** — Remove outliers
- **Typecast** — Typecast the required columns for analysis
- **Rename** — Rename the columns after typecasting
- **Remove** — Remove duplicate data from rows and columns

Data Analysis

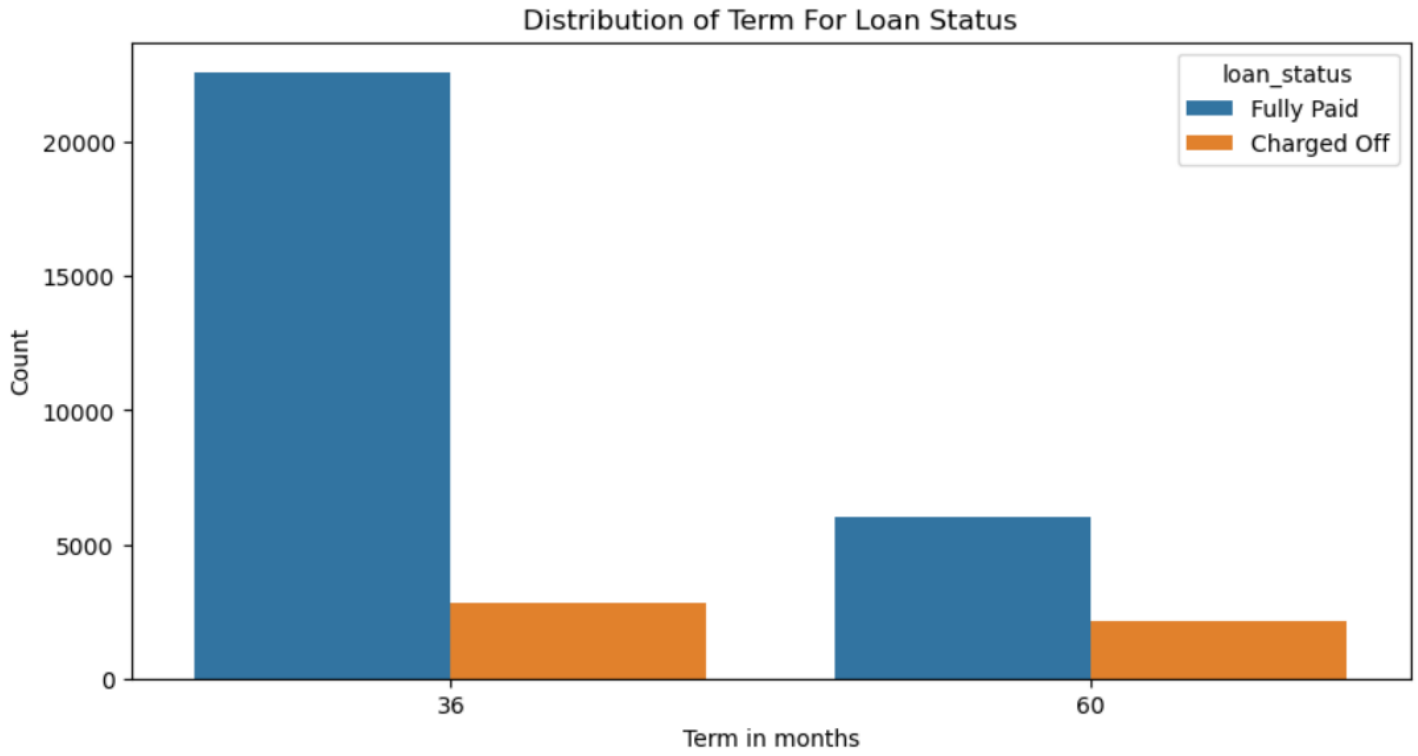
Home Ownership

- Those who have rented house are more likely to default
- The defaulters possibility are followed by those who have mortgaged e.g land, gold etc.



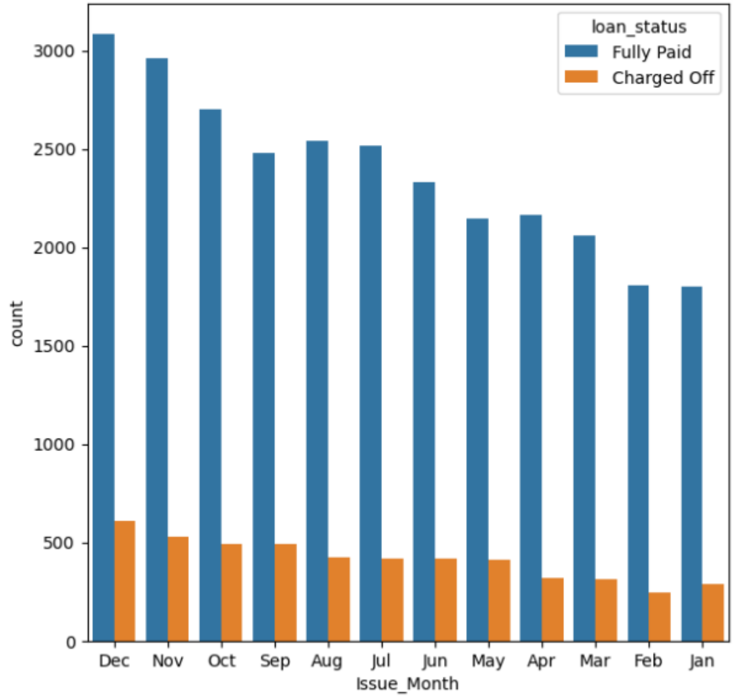
Term of installments

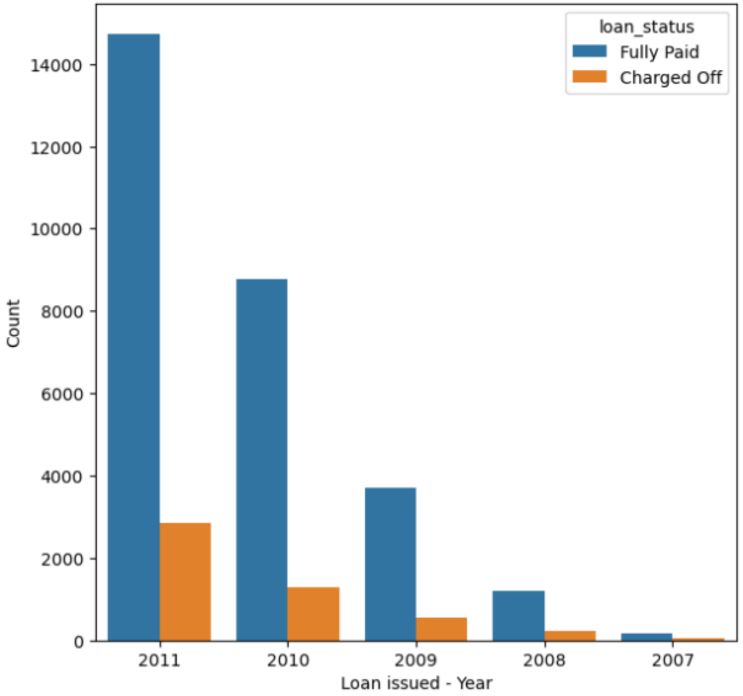
- Those who opted for installment terms as 60 months are more likely to pay loan on time
- Those who have opted for term as 36 months are more likely to be defaulters.



Issue Date

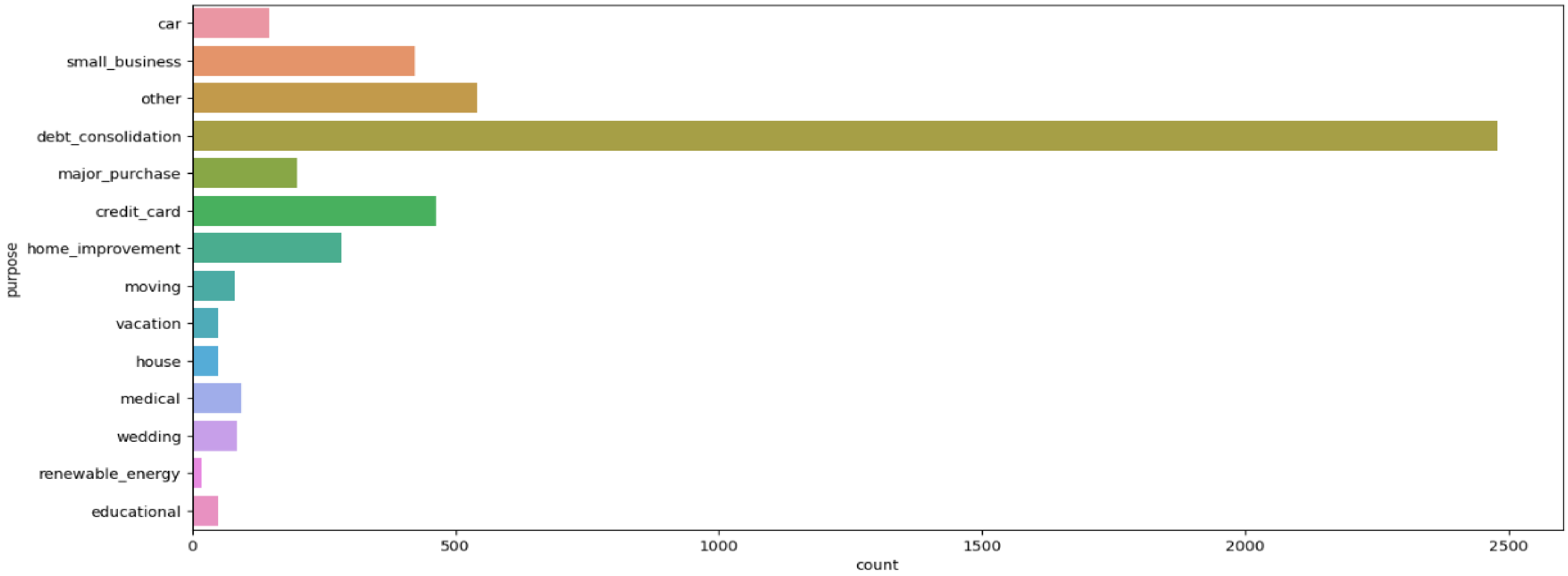
- Those who have opted for loan in the 2011 and approx. in Nov-Dec are more likely to be defaulters





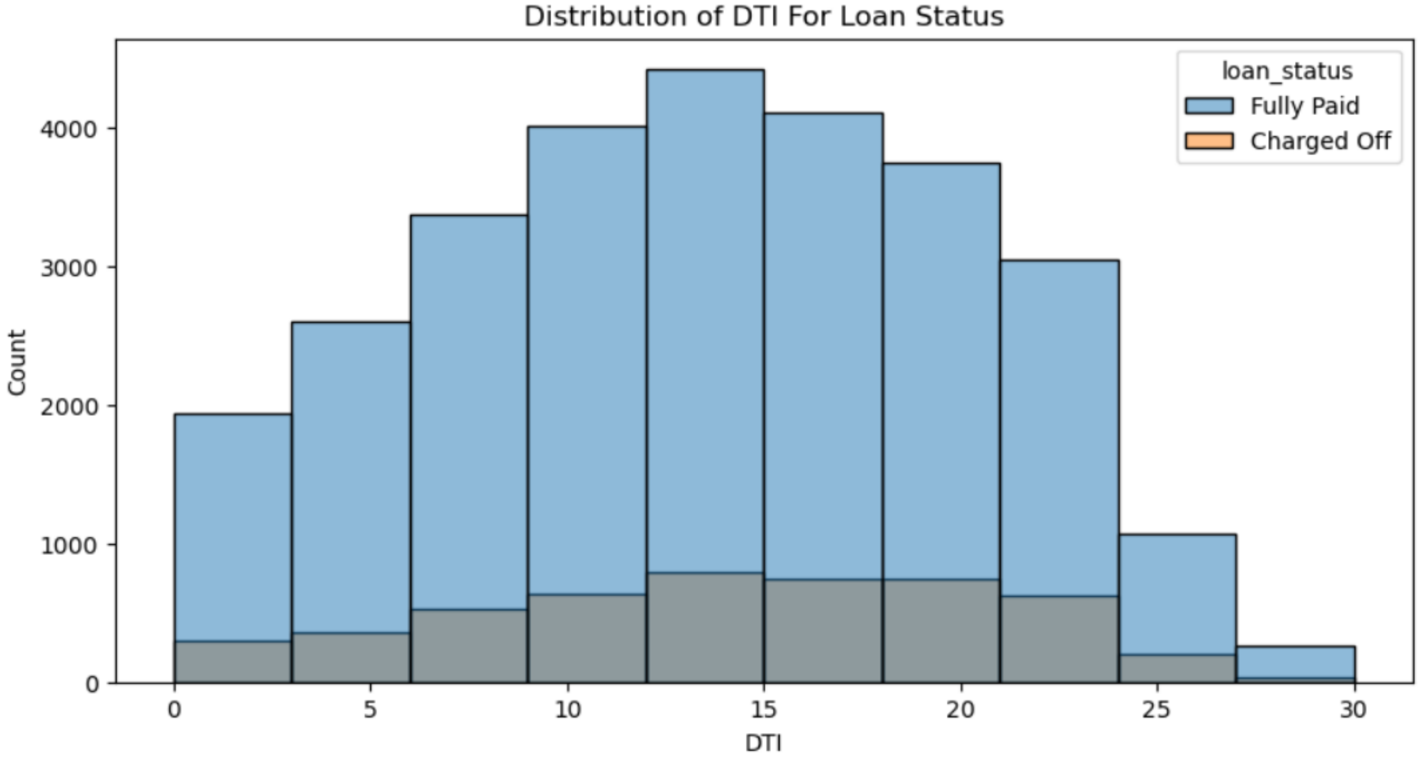
Purpose

- It is somewhere clear that the customers whose purpose is to make the adjustments for debt consolidation are more likely the defaulters. Other than that purpose, customers can be considered under the radar for loan sanctioning.



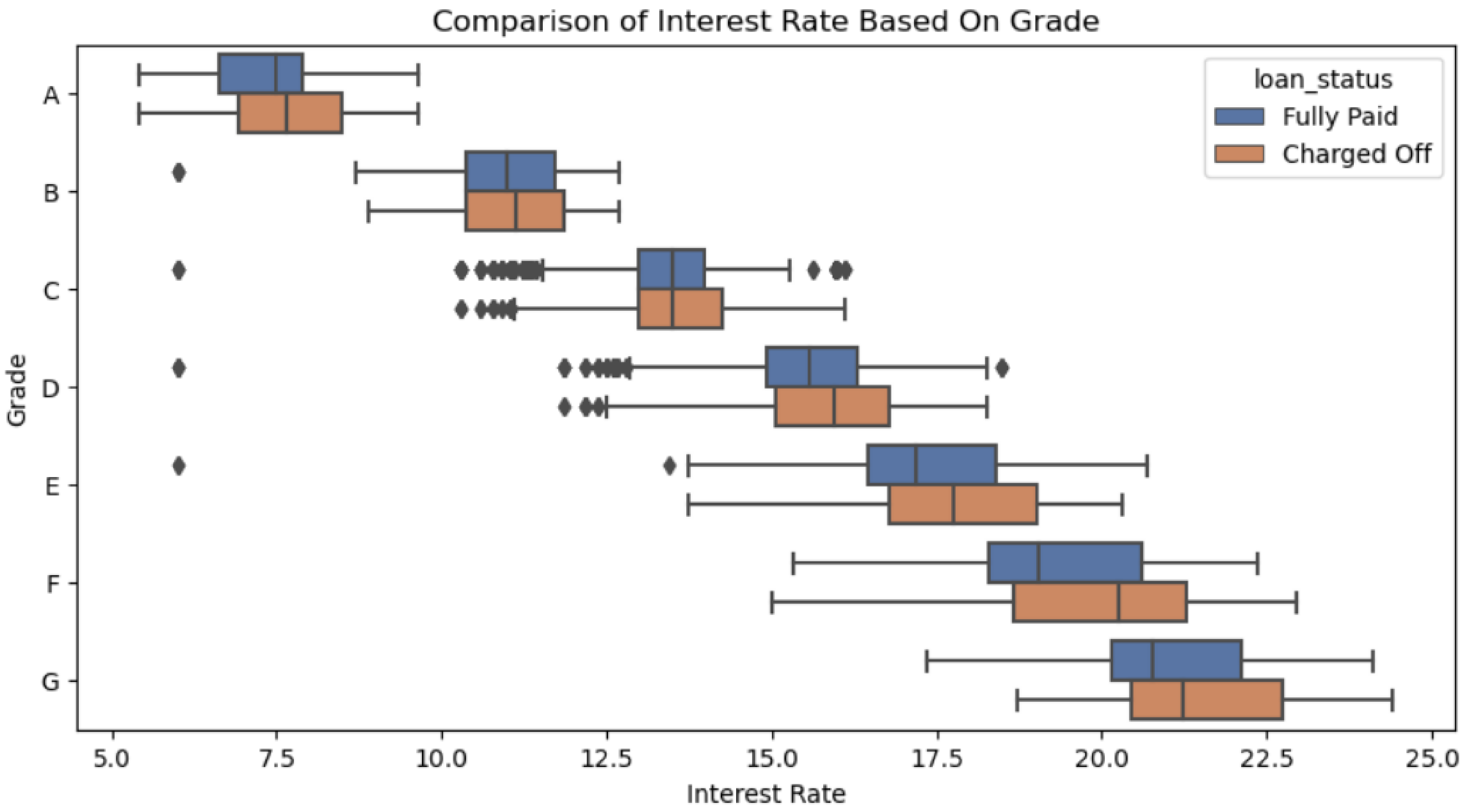
DTI

- The Loan Status varies with DTI ratio, we can see that the loans in DTI ratio 10-15 have higher number of defaulted loan but higher dti has higher chance of defaulting.



Interest Rate - Grade

- Grade here represent risk factor. So, we can say interest rate increases with the risk.



Insights and Recommendations

- Following are the major driving factors which can be utilized for predicting the chance of defaulting:
  - DTI
  - Grades
  - Loan Amount and Installments
  - Annual income
  - Pub Record Bankruptcies
- There are few insights if we are considering smaller constraints, and can be considered as defaulters:
  - who have annual income in the moderate range i.e. 50000-100000
  - who have either less working experience or more than 10+ years of experience.
  - who take higher loan amounts
  - who don't own house
  - whose purpose for loan is 'debt consolidation'
  - whose verification status is not verified