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Lending Club Case Study

By:
Group Facilitator: Divya Singh
Team Member: Uttam Sarkar
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- Problem Statement

- Analysis approach
  - ➢ Data understanding
  - ➢ Data Cleaning
  - ➢ Data Analysis

- Conclusion
 - ➢ Recommendation

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What is Lending Club?

Lending Club(termed as Finance Company) is a marketplace for personal loans that matches borrowers who are seeking a loan with investors looking to lend money and make a return.

Business Problem :

The Finance company wants to understand the driving factors (or driver variables) behind loan default. This will reduce the financial loss to the company as:

• 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

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LOAN DATASET
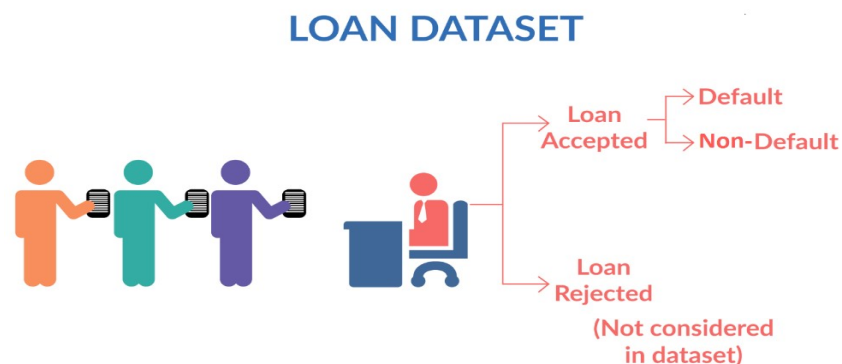
Target Variable :

Fully paid: Applicant has fully paid the loan (the principal and the interest rate)

Current: Applicant is in the process of paying the installments. 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

The Other Variables in Data can be classified in three Categories :

Demographic variables: Related to the applicant. ex - age, occupation, employment details etc.

Loan characteristics: ex - amount of loan, interest rate, purpose of loan etc. and

Customer behavior variables: These are generated after the loan is approved, and will not be available during the loan application process. ex - delinquent 2 years, revolving balance, next payment date etc.

Data Cleaning

• The customer behavior variables are not available at the time of loan application, and thus they cannot be used as predictors for Loan approval.

• Percentage of missing values is quite high for few columns(>95%) which can not help us in our analysis, those columns can be removed

• We considered only '**Fully Paid**' & '**Charged-off** ' value from the target variable 'loan_status' as they are the providing final status of loan . The ones marked 'current' are neither fully paid not defaulted, therefore can be dropped.

• Annual Income columns contains many outliers, which can affect our analysis. So these need to be dropped

• Format for Date and Interest Rate columns is converted to a suitable and convenient format to work with using the right methods.
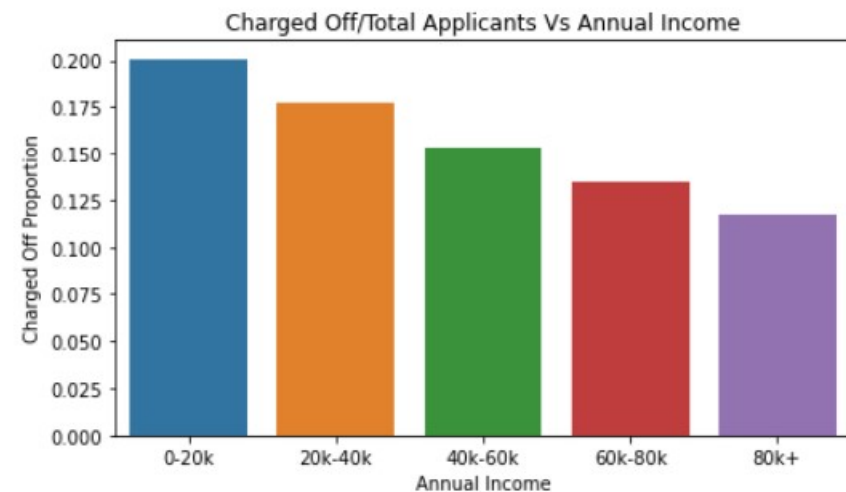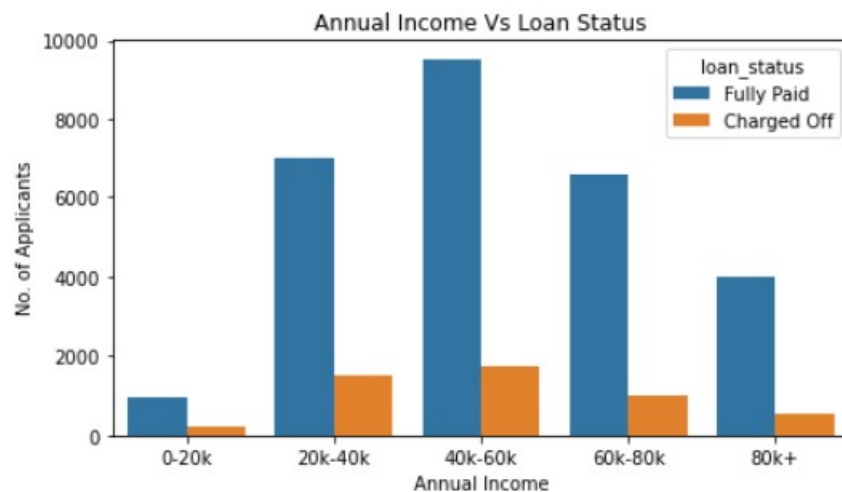
- Complete Dataset contains :

  - 86 % Fully Paid Applicants
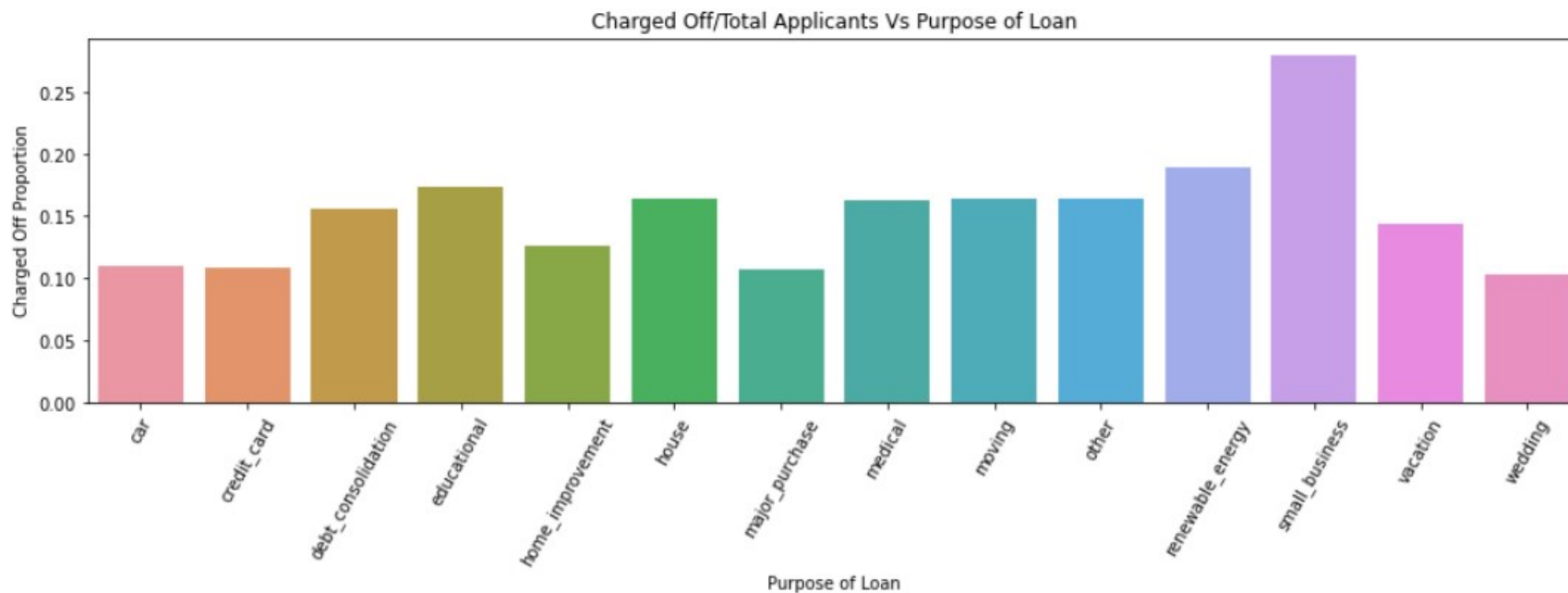 - 14% Charged Off (Defaulters)
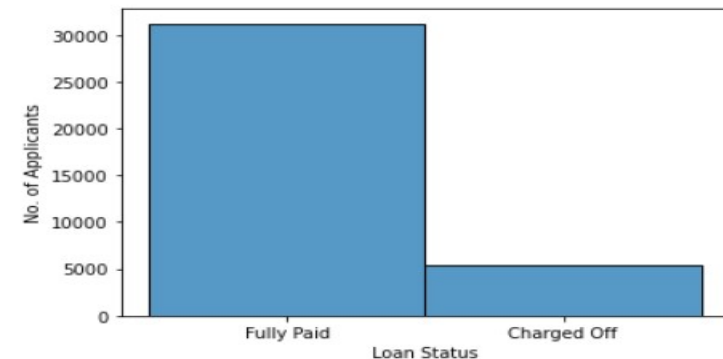
- Most of the Applicants took loan for Debt Consolidation
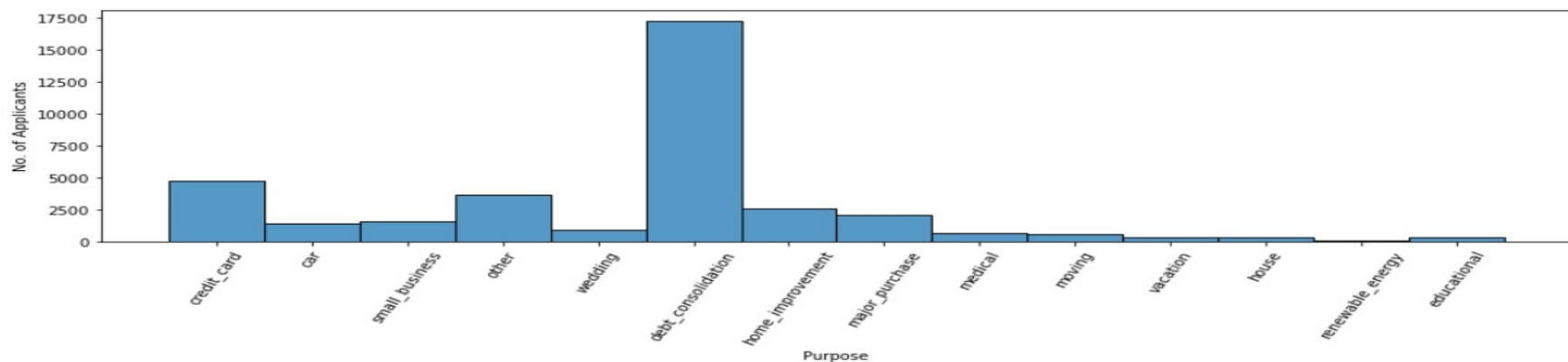
Loan Status relation with Annual income shows that lower income group has high number of charged off . As income is increasing Charged off Proportion is decreasing.
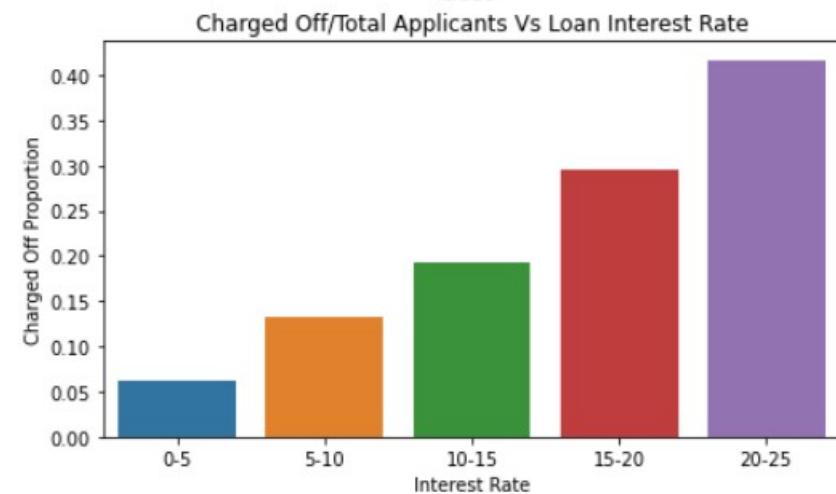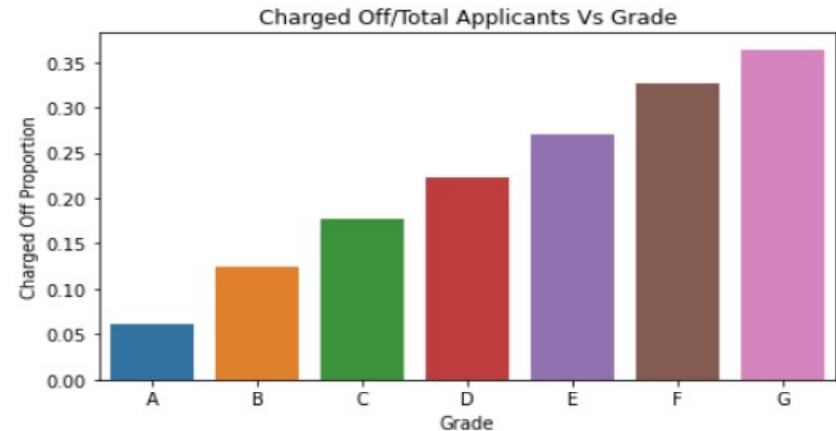
Number of person taking loan are high for Debt Consolidation but proportion of defaulters is high for those who are taking loan for Small Business.

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• Grade 'G' have high proportion of loan defaulters

• Relation with Interest rate shows that as applications who are getting loan at high interest rate have more chance of Charged off.

Charged Off/Total Applicants Vs Grade

Charged Off/Total Applicants Vs Loan Interest Rate

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• Income range between 0-20K have high Number of defaulters. As income increasing defaulter proportion is decreasing.

• Number of person taking loan are high for Debt Consolidation but proportion of defaulters are high for Small Business. People from all the grade start small business or start-up and small business can be failure for different reason including proper market survey and competition etc. So, once failure, it is difficult to manage the finances. According to one survey, the financial crisis in 2008 hit small businesses hard. There has been some increase and growth among small business industries in the U.S. Despite these positive trends, small business failure rates have increased by 40% from 2007 to 2010. This loan data is from 2007 to 2011 so depicting the picture. We recommend to check the application purpose 'Small Business' keeping in mind that we also need to encourage entrepreneurship.

• Proportion of defaulters increasing as we go from Grade 'A' to 'G'. Grade 'G' has high number of defaulters.

• Applicants having high number of Public Record of Bankruptcies are mostly Charged off

Thank You !!!