

Lending Club Case study

Business Understanding & Objective

Lending club is a online loan crediting company which sanctions loan to their applicants based on their need. It has different products like debt, credit, educational etc

- 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.

Problem Statement :-

- The company wants to know which type applicants are likely to default. If it is possible to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss.
- Identification of such applicants using EDA is the aim of this case study.

Types of variables :-

- Applicants data – employer_name, emp_length, address. ...etc.
- Loan related data – loan_amnt, int_rate, gradeetc.
- Applicants performance data (After loan approval) - total_rec_prncp, total_rec_int, last_pymnt_d ...etc.
- So we have to concentrate only in Applicants data & Loan data which will be available at the time of application.

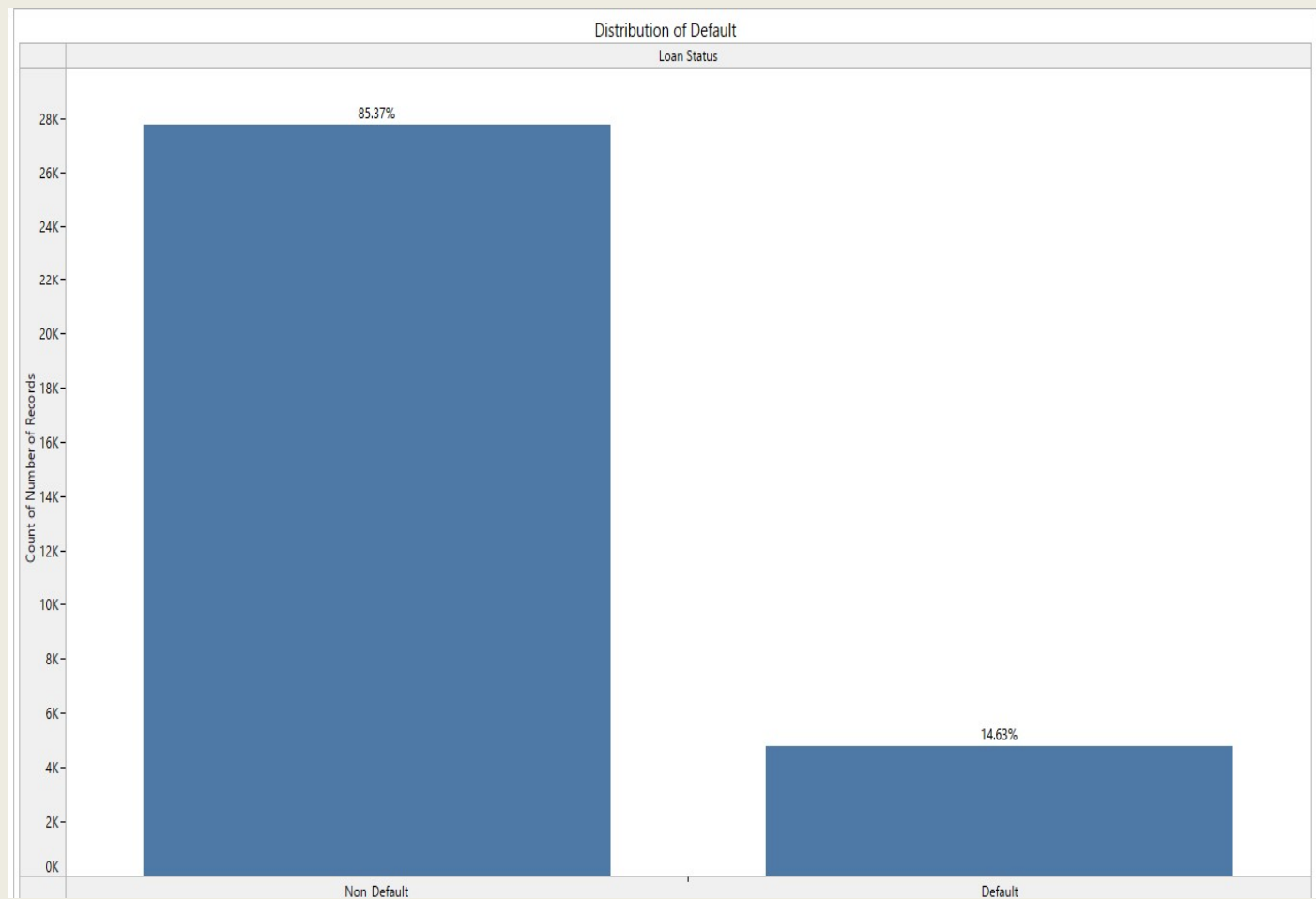
Data Cleaning & Manipulation :-

- Removed unnecessary columns and columns having repetitive values and NA's.
- Issue_date is changed to required format and derived a metric year for year wise analysis.
- Derived some categorical columns by changing continuous variables like loan amount, interest rate, annual income etc based on Quantiles.
- Some columns are in character type, changed them to Number type.

Exploratory Data Analysis

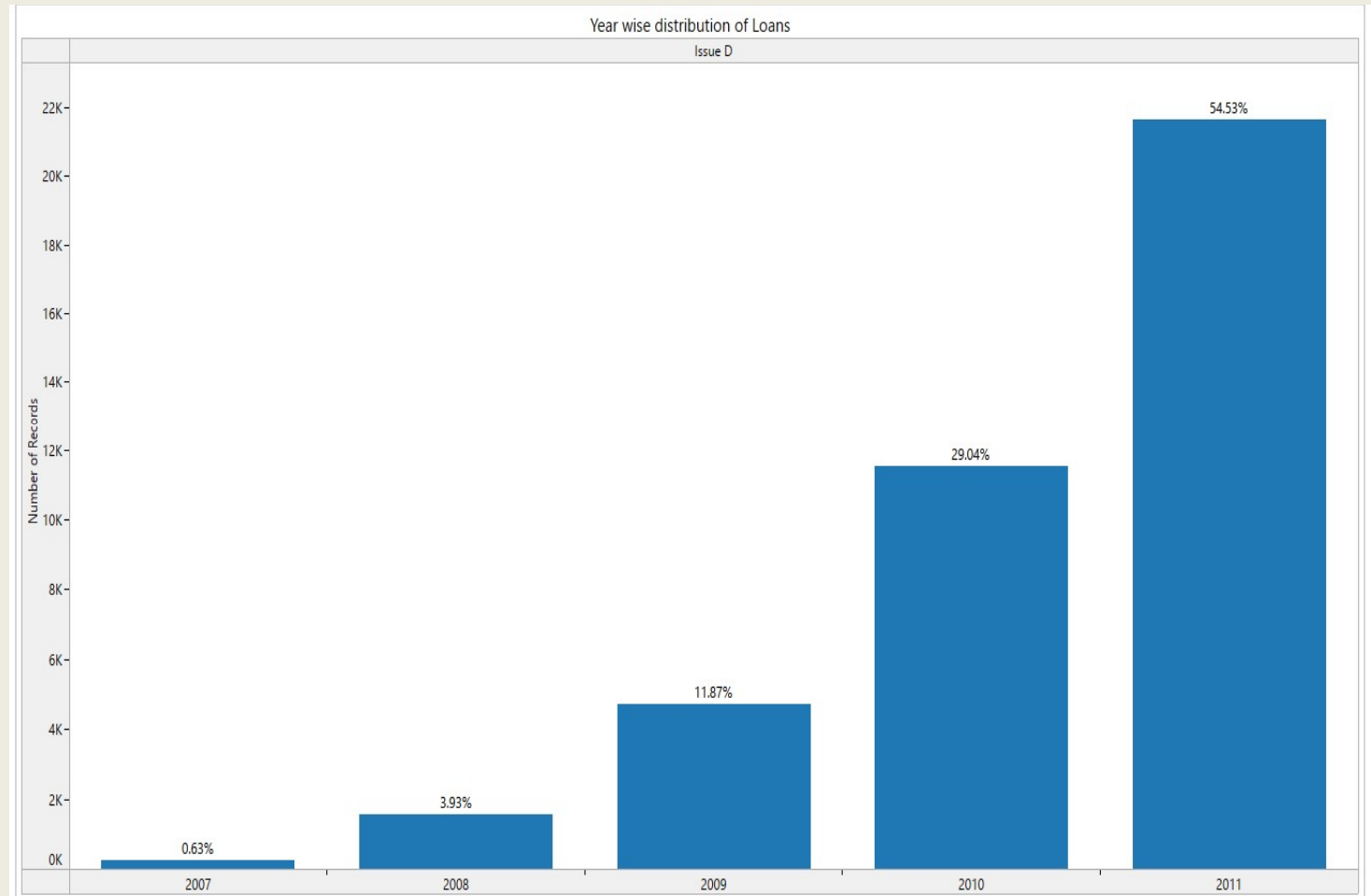
Distribution of Default rate :-

- Overall Default Rate is 14%



Exploratory Data Analysis

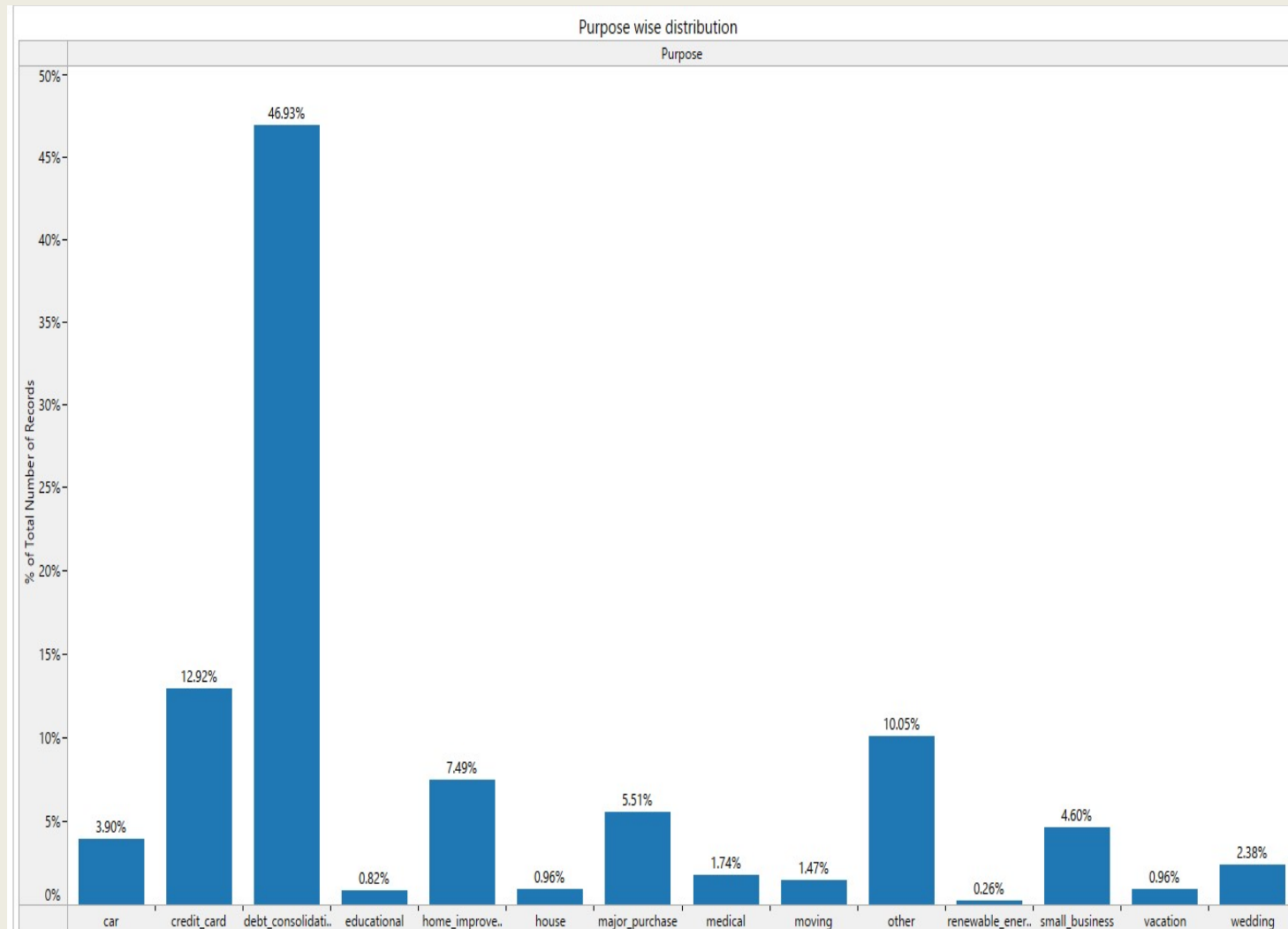
Year wise distribution of Loans :-
Loan applications have been increased during 2011.



Exploratory Data Analysis

Purpose wise Distribution

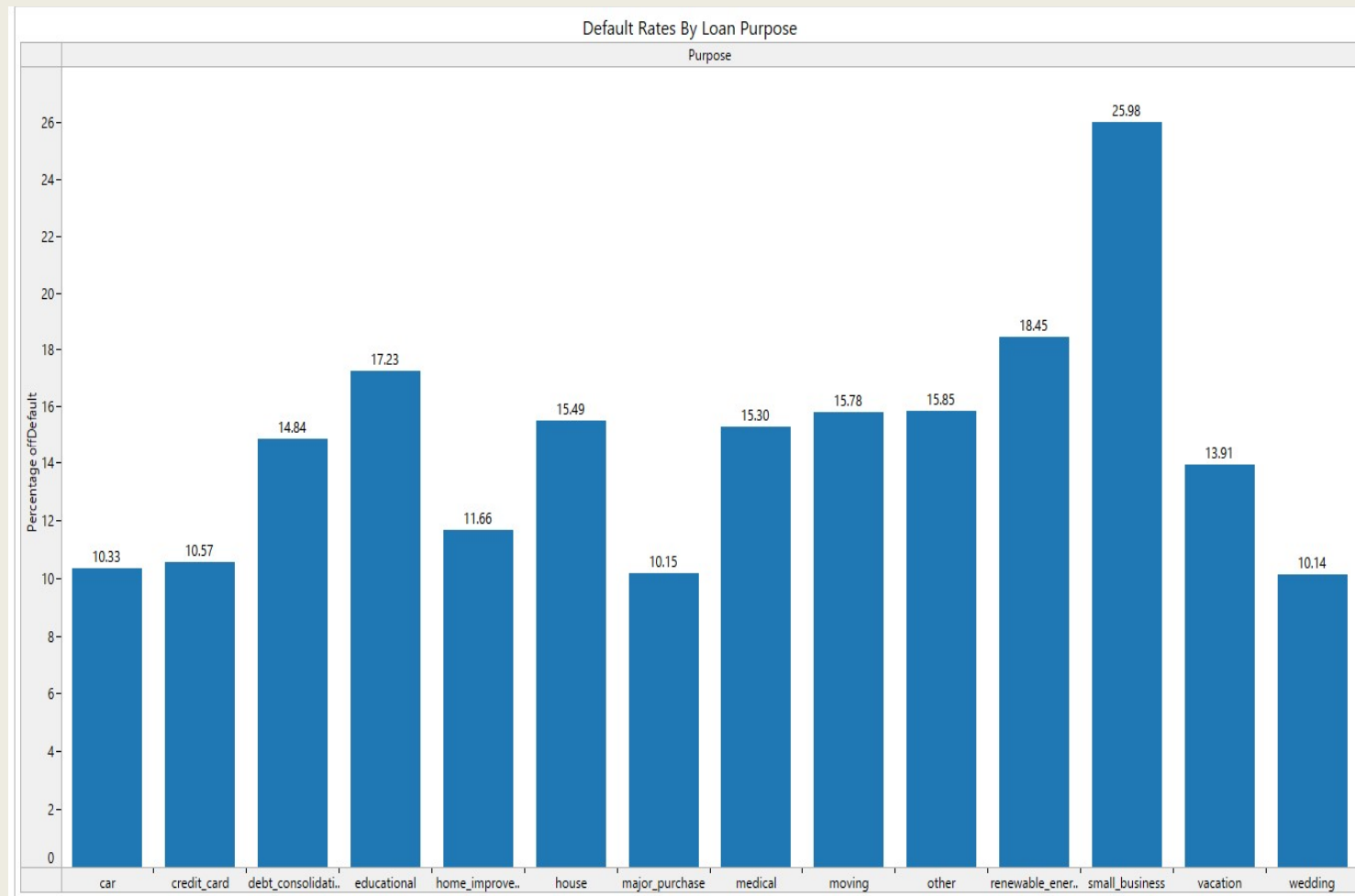
- 46.93% debt consolidation
- 12.92% credit card
- 10.0% other
- 7.49% home improvement
- 5.51% major purchase
- 5.60% small business



Exploratory Data Analysis

Purpose wise Default rate

- Small business: 25.98%
- House: 15.49%
- Educational: 17.23%
- Debt consolidation: 14.84%
- Home improvement: 11.66%
- Credit card: 10.57%



Exploratory Data Analysis

This concludes us that we have to concentrate on 4 four variables which are popular and which are likely to be too risky for loan approval by Lending club.

1. Credit card
2. Debt Consolidation
3. Home improvement
4. Small business

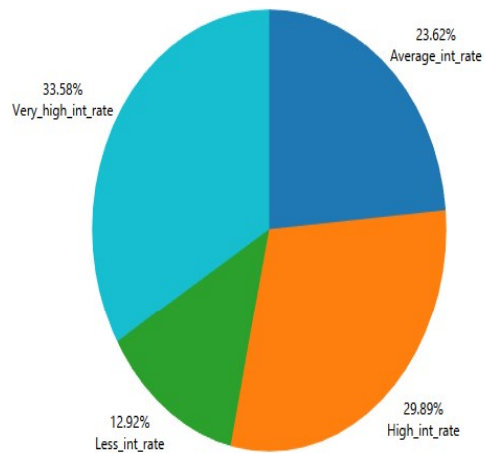
Analysis approach includes to find out the variables which are indicators of default for the top 4 purposes.

Grade is given by Lending club so Grade is one of indicators for all the purposes . Followings variables are key indicators for top 4 purpose of loans.

1. Credit card – Interest rate, Employee length, Home ownership
2. Debt consolidation - Interest rate, Loan amount, Home ownership
3. Home improvement – Interest rate , Home ownership, Annual income
4. Small business – Interest rate, Home ownership, Loan amount

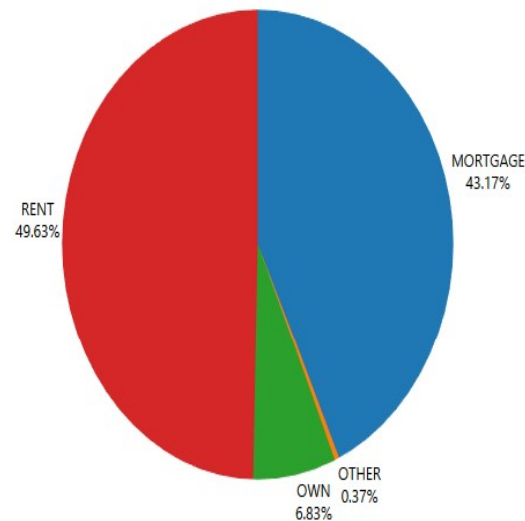
Exploratory Data Analysis

Credit card – Default – Interest rate



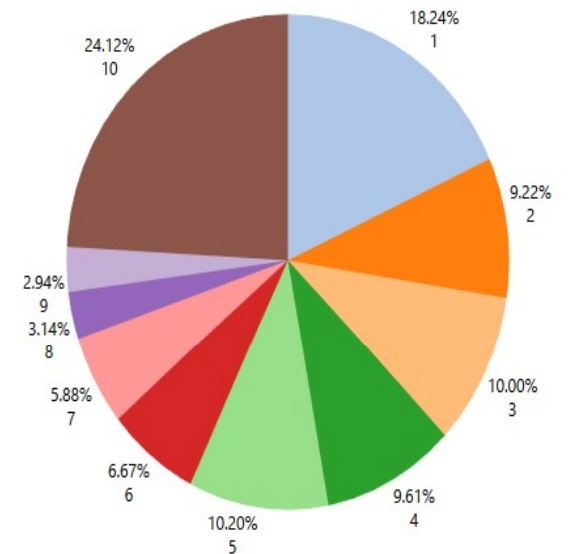
High and very high interest rated applicants contribute over 65%

Credit card – Default – Home ownership



Rent and Mortgage applicants contribute over 92%

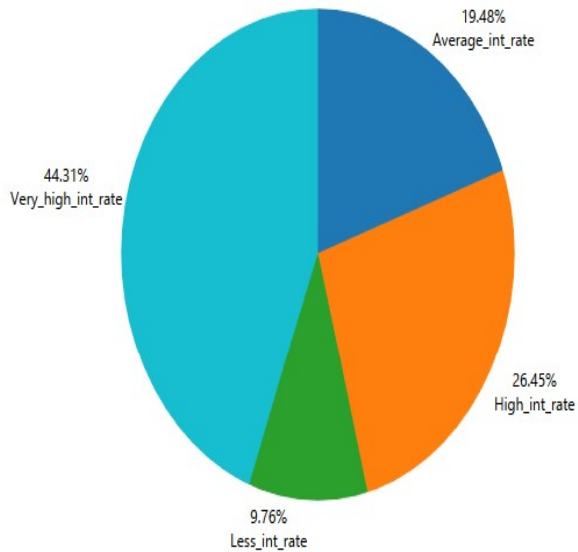
Credit card – Default – Employee length



1,2 ,3 and more than 10 years experienced applicants contribute over 62%

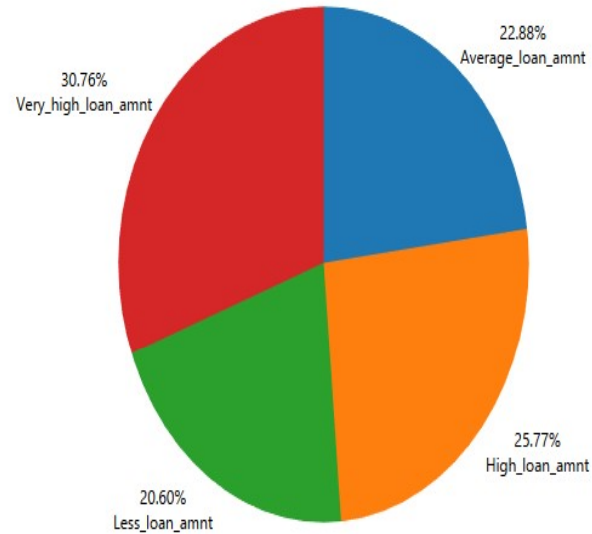
Exploratory Data Analysis

Debt Consolidation – Default –
Interest rate



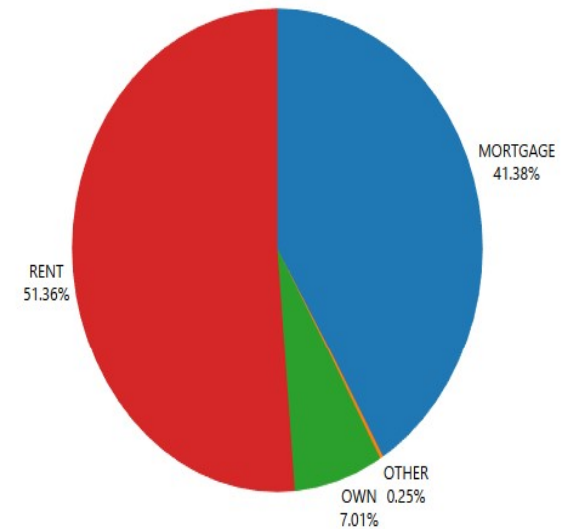
High and very high interest
rated applicants contribute over
65%

Debt Consolidation – Default –
Loan amount



High & Very high loan approved
applicants contribute over 57%

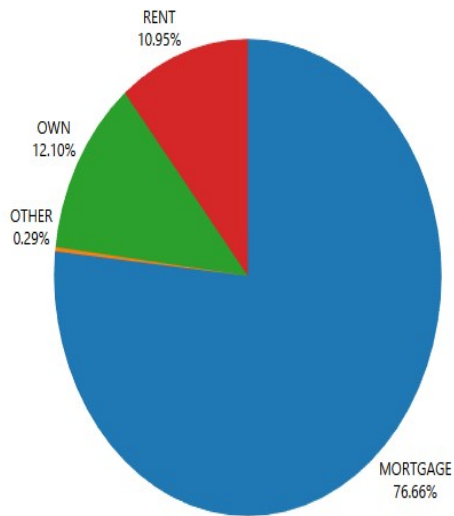
Debt Consolidation – Default –
Home ownership



Rent and Mortgage applicants
contribute over 92%

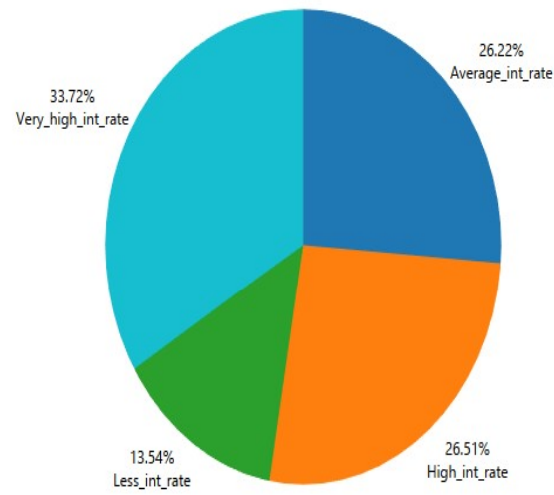
Exploratory Data Analysis

Home improvement – Default –
Home ownership



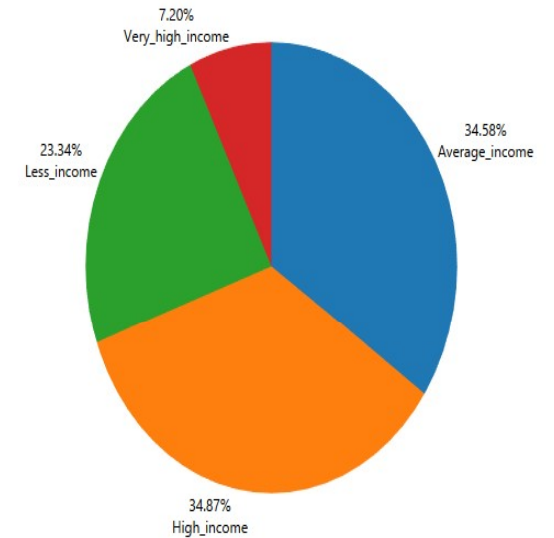
Mortgage applicants contribute over 76.66%

Home improvement – Default –
Interest rate



High and very high interest rated applicants contribute over 60%

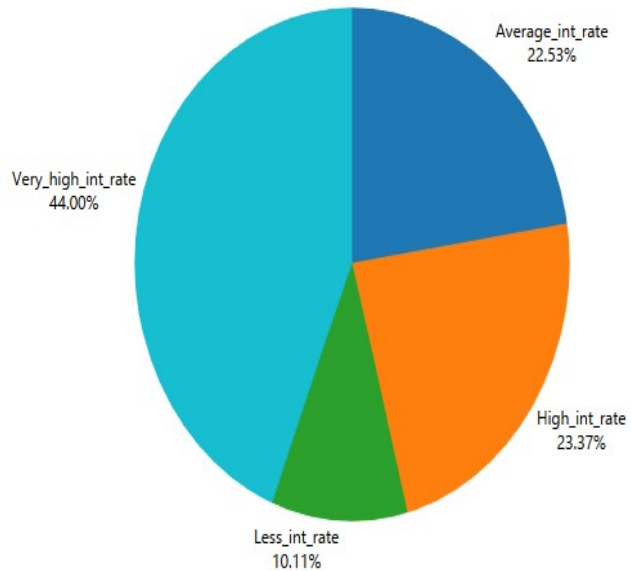
Home improvement – Default –
Annual income



High and average income category applicants contribute over 75%

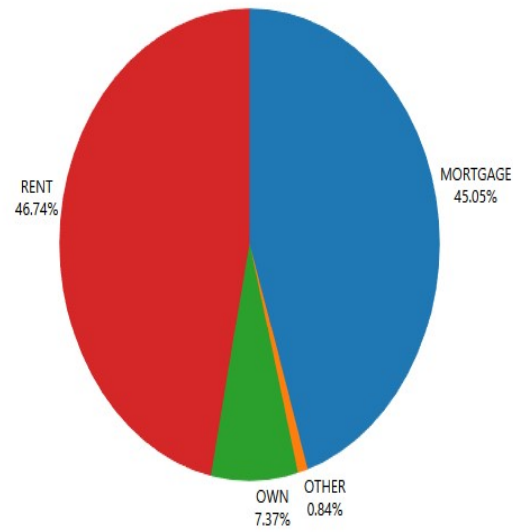
Exploratory Data Analysis

Small business – Default – Interest rate



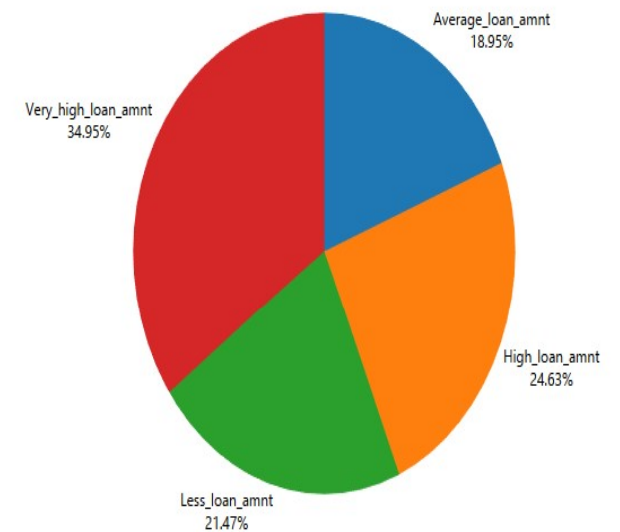
Very high interest rated applicants contribute over 44%

Small business – Default – Home ownership



Rent and Mortgage applicants contribute over 92%

Small business – Default – Loan amount



High & Very high loan approved applicants contribute over 60%