

Lending Club Case Study

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Abstract

This company is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures. Borrowers can easily access lower interest rate loans through a fast online interface.

Problem Statement

Lending loans to 'risky' applicants is the largest source of financial loss (called credit loss).

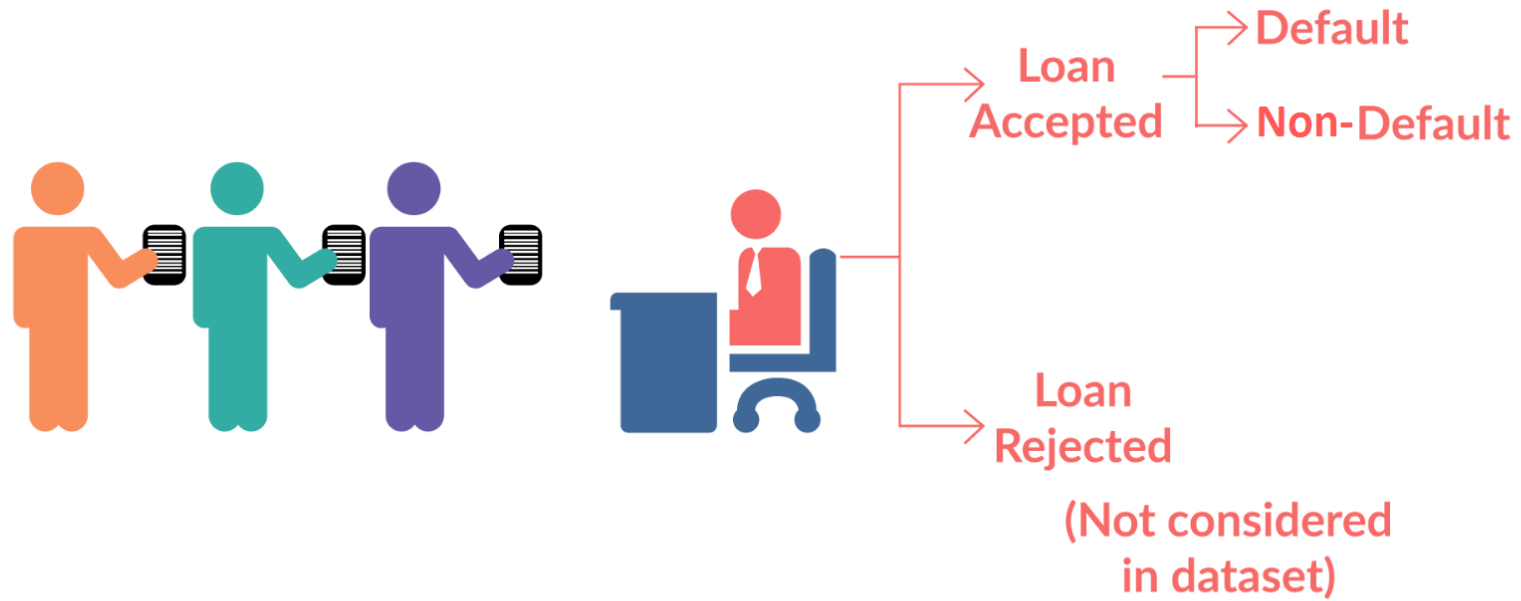
The credit loss is the amount of money lost by the lender when the borrower refuses to pay or runs away with the money owed. In other words, borrowers who **default** cause the largest amount of loss to the lenders. In this case, the customers labelled as 'charged-off' are the 'defaulters'.

Goal

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.

Business Loan Decision

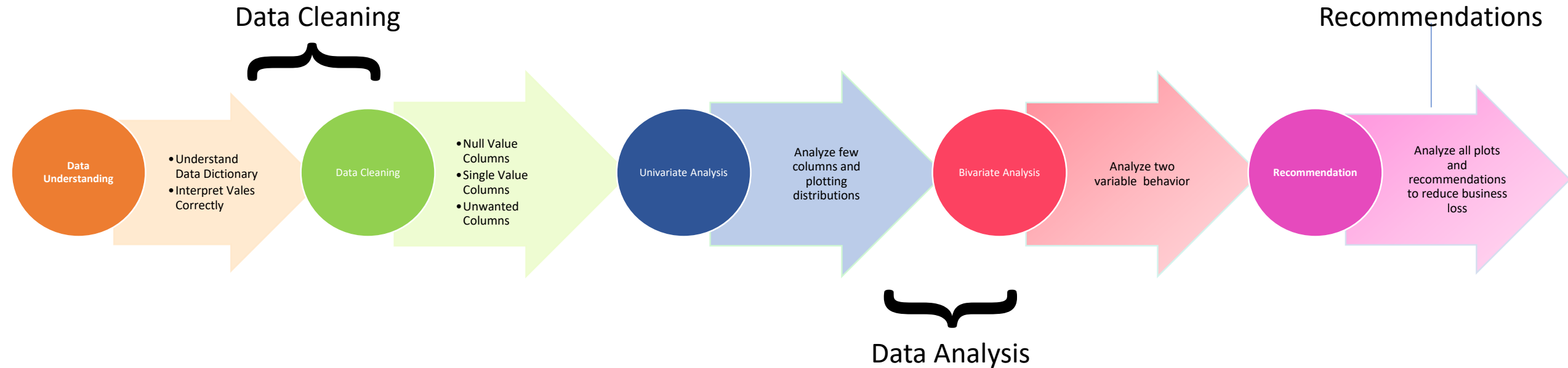
LOAN DATASET



Business Scenarios -

- 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.)

Problem Solving Approach



Univariate Analysis

- Quantitative Variables –

- loan_amnt – Loan amount's are in the range from 5000 -15000
- funded_amnt - Funded amount's are in the range from 5000 -15000
- int_rate - Interest Rates on loans are in range of 10% - 15%
- annual_inc - Borrower's Annual incomes are in range of 40000- 80000

- Unordered Categorical Variables

- loan_status - 14% loans were charged off out of total loan issued
- Purpose – Most of the loans taken for the purpose of 'debt_consolidation' and charged off count was also high for this purpose of loan

Univariate Analysis (cont.)

- Ordered Categorical Variables from the dataset

- loan_amnt

- ☐ People who had taken loan to repay in 60 months had more % of number of applicants getting charged off as compared to applicants who had taken loan for 36 months.

- Ordered Categorical Variables from Derived Columns (issue_month and issue_year) –

- ☐ The count of loan application is increasing year by year

- ☐ Increase in number of loan applications are also contributing more to number of charged off applications.

Segmented Univariate Analysis

- Term vs Loan Amount –

- ☐ Loan amounts were relatively high in the range for 60 months term when compared to 36 months term

- Derived Columns – month and year

- ☐ The loan amounts were almost equal to 10000 for all months
- ☐ The number of loans were relatively high during the month of December

Multivariate Analysis

- The observation is done for 3 below columns only for analysis purpose
 - loan_amnt
 - annual_inc
 - Int_rate
- ☐ Higher the interest rate higher charged off ratio
- ☐ Higher the annual income higher the loan amount slightly.
- ☐ Increase in number of charged off with increase in year.
- ☐ Interest rate is increasing with loan amount increase

Bivariate Analysis

- ❑ Loan amount range ≥ 30000 has more charge off proposition
- ❑ More interest rate has more charge off proposition
- ❑ Annual income range ≥ 80000 has less charge off proposition
- ❑ Annual income range ≤ 80000 has less charge off proposition
- ❑ Increase in annual income charged off proportion got decreased

Recommendations

- Lending Club should reduce high interest loans for 60 months term, as we say the proportion of defaulters to full paid is higher when compared to 36 months term
- Small business loans are defaulted more which can be avoided.
- Categorically grouping the customers based on their incomes, total payment, interest rates and studying the pattern of defaulters helps a lot in this analysis
- Loan purpose has a higher degree of affinity for the Charge off, so the loan purpose as a category to be considered to reduce business loss

Thank You 😊