Lending Club Case Study

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Content

1. Introduction to Case Study

The 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.

This case study examines the attributes and drivers that will enable Lending Club to effectively identify risky loan applicants using Exploratory Data Analysis.

2.1 Problem Statement

Lending loans to ‘risky’ applicants is the largest source of financial loss (called credit loss). 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 this case, the customers labelled as 'charged-off' are the 'defaulters'.

If one is able to identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss.

2.2 Business objectives

- Understand the **driving factors (or driver variables)** behind loan default, i.e. the variables which are strong indicators of default.
- Understanding different patterns hidden in dataset
- The company can utilise this knowledge for its portfolio and risk assessment.

3. EDA

Exploratory Data Analysis (EDA) is an approach that is used to analyze the data and discover trends, patterns, or check assumptions in data with the help of statistical summaries and graphical representations.

4. Data Sourcing, Cleaning and Understanding

Data Sourcing: It contains the complete loan data for all loans issued through the time period 2007 to 2011.

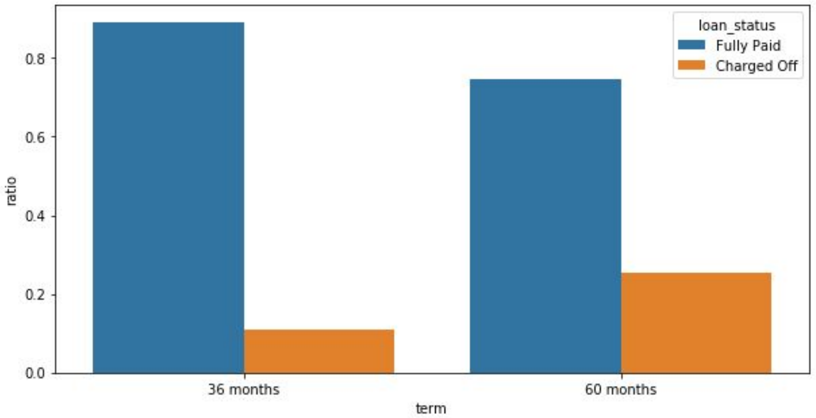
Data Cleaning:

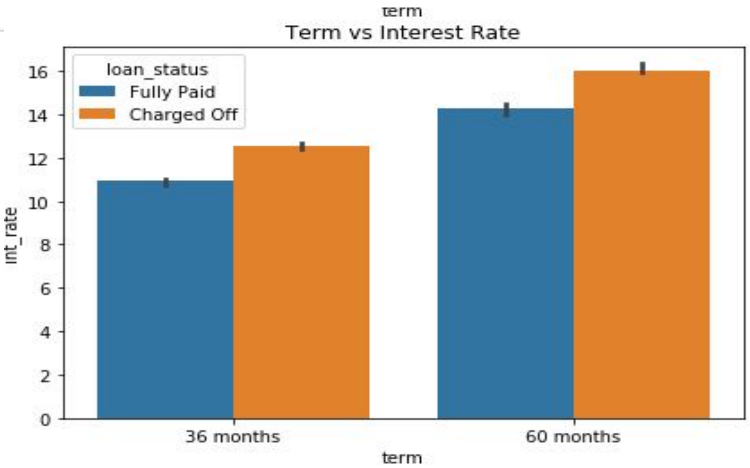
1. Removing all columns which have no Data.
2. Removing all rows which have no Data.
3. Removing columns which have single unique values
4. Checking for null values and their percentages with respect to total records.
5. Removing columns with more than 30% null or NaN records
6. Checking the funded amount should not be greater than applied loan amount.

Data Understanding: We use describe(), shape , dtype and value_counts() to understand the data as whole

5. Analysis and Visualizations

Term - Tenure of loan

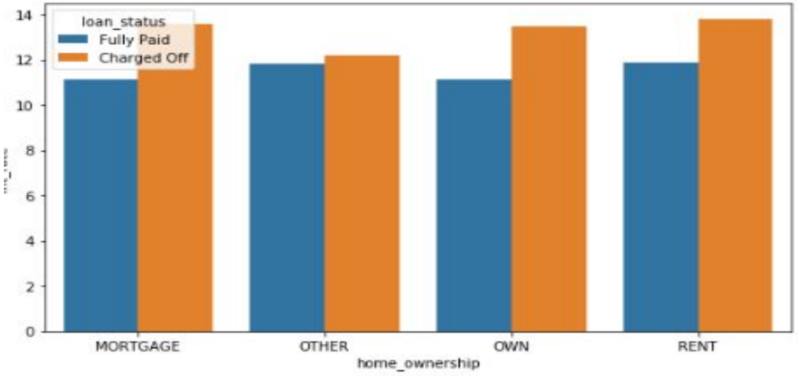


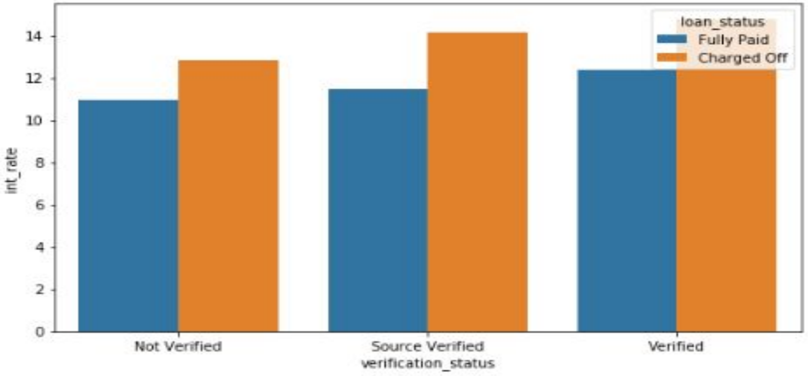


Observations:
For Term, we saw that for 60 months have higher Charged Off ratio when compared to 36 months. It states that due to **longer time commitments so being Charged Off**.

For Comparing with Interest rates; it is evident that whether term is 36/60 months, Charged Off ratio is higher. **This states that if interest rate rises, there is chance that borrowers will Charged Off.**

Interest rate



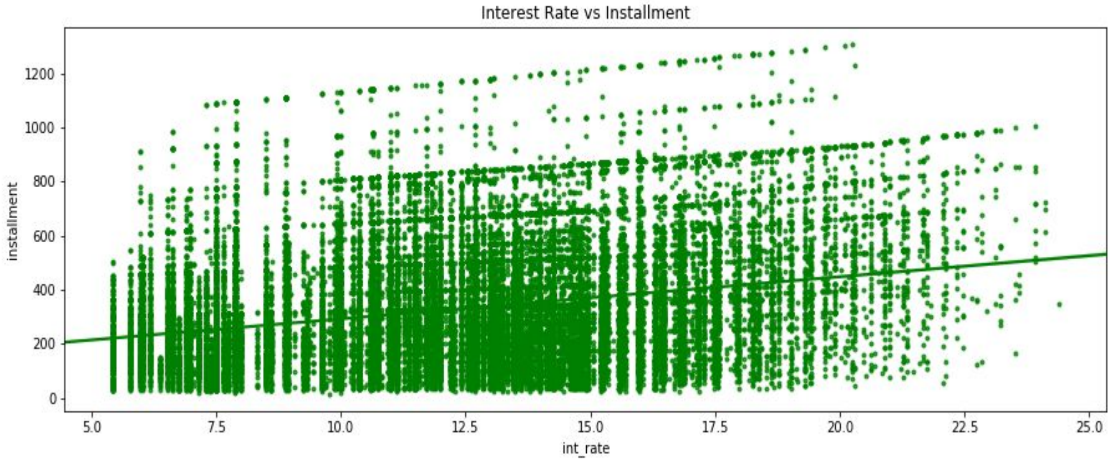


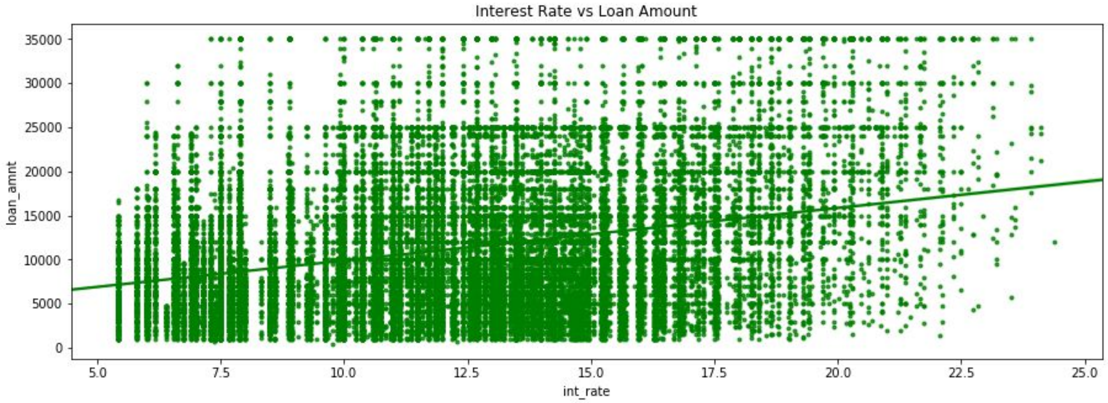
We see that for **Home ownership= OWN and MORTGAGE, has more difference for Charged Off ratio**

Even for Verification Status, **Charged Off ratio is very high for all categories of verification status**.

Verification Status is a strong indicator; since Lending club is conducting checks but still the Charged Off ratio is very high. They must review the checks again (Especially for Source verified)

This is due to high interest rates where they are more than 12%. (on median)



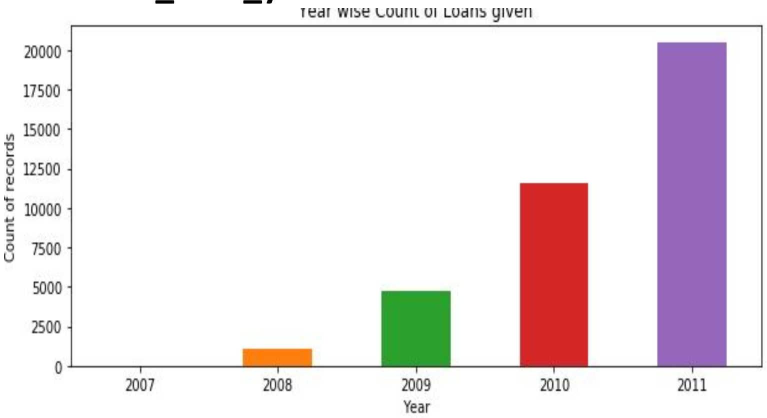


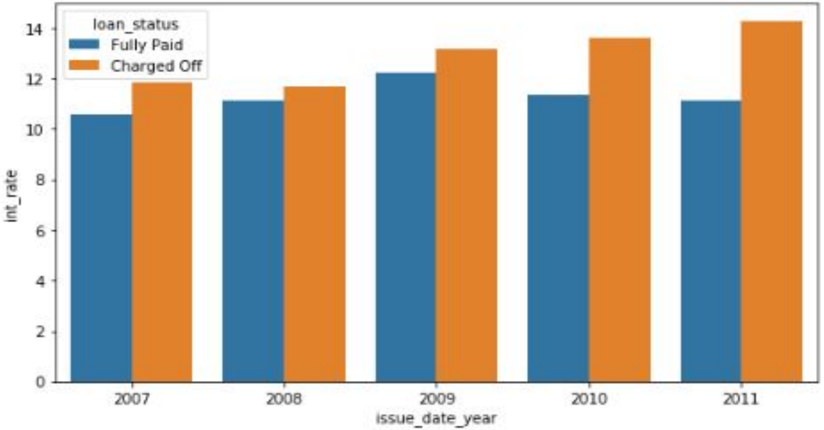
Interest rate

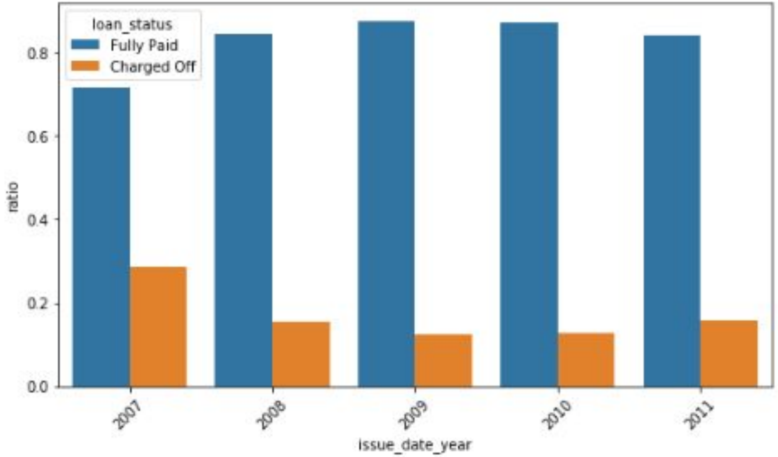
There is an up-trend for interest rate and installment. **As the interest rate rises, it is evident that installment will rise too.**

The same goes for Loan amount too. **If loan amount rises, it is evident that interest will rise too.**

Issue_date_year







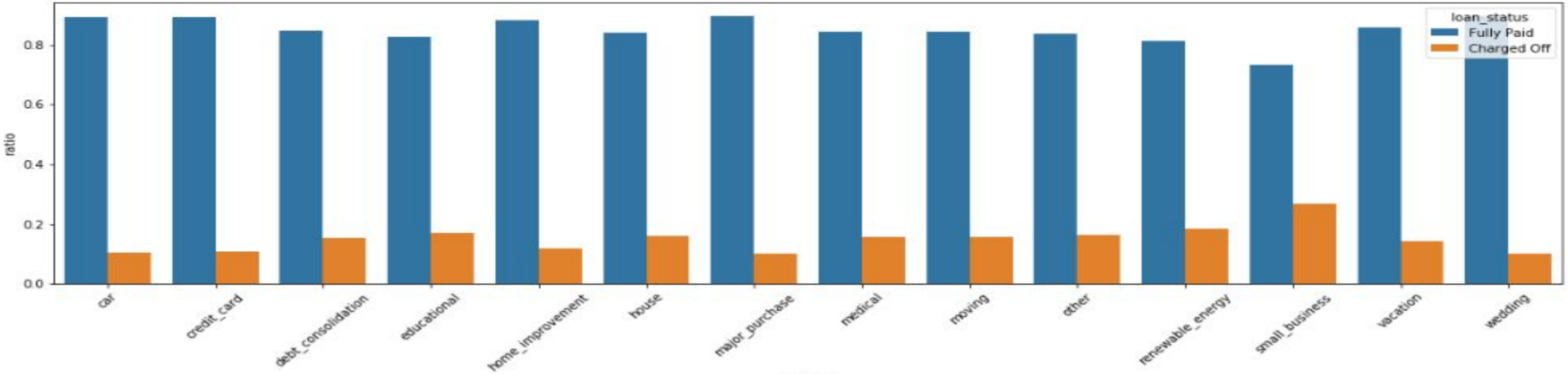
Year by year the count of loan got increased.

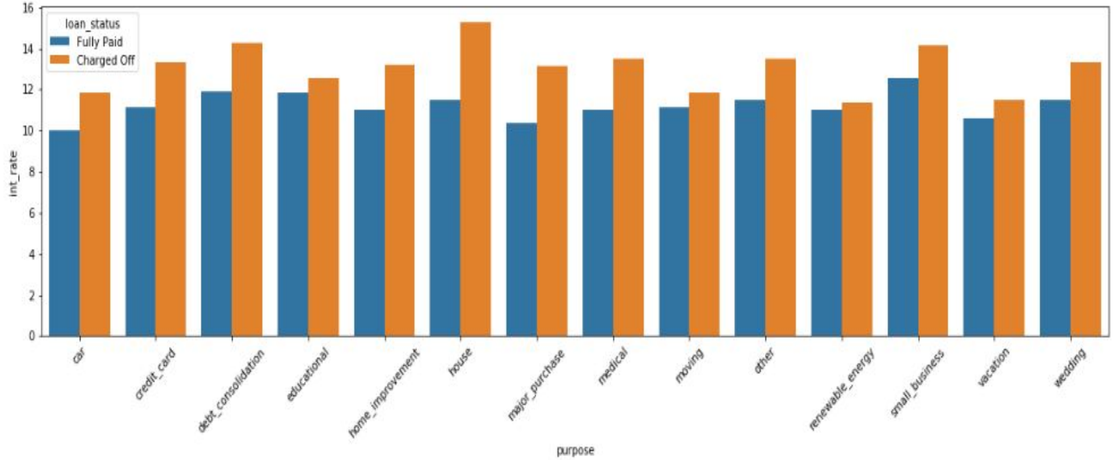
When we compare loan status ratio year wise, we that there is **decline in Charged Off till 2010 .**

But as soon as we include Interest rate, the chart changes and **we see that the difference for Charged Off was minimal in 2008 & 2009, but increased in 2010 & 2011.**

This is due to rise in interest rate being above 12% on median.

Purpose

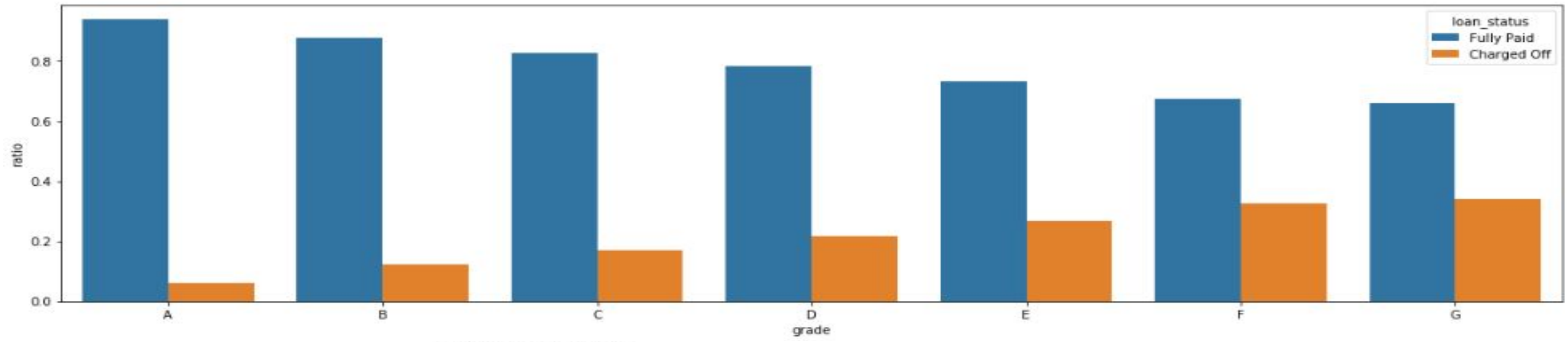


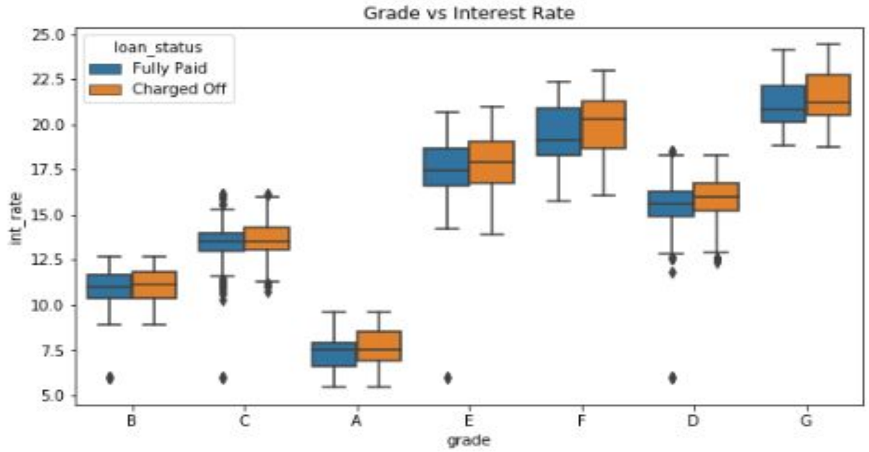


For purpose= **Small Business & house** , it seems that **they are more likely to Charged Off.**
The Lending Club must do additional checks for repayment while providing loans to mentioned purposes.

Wrt Interest rates, House and major purchase turns to be on higher difference for charged Off.
Also every purpose has high Charged off.

Grade

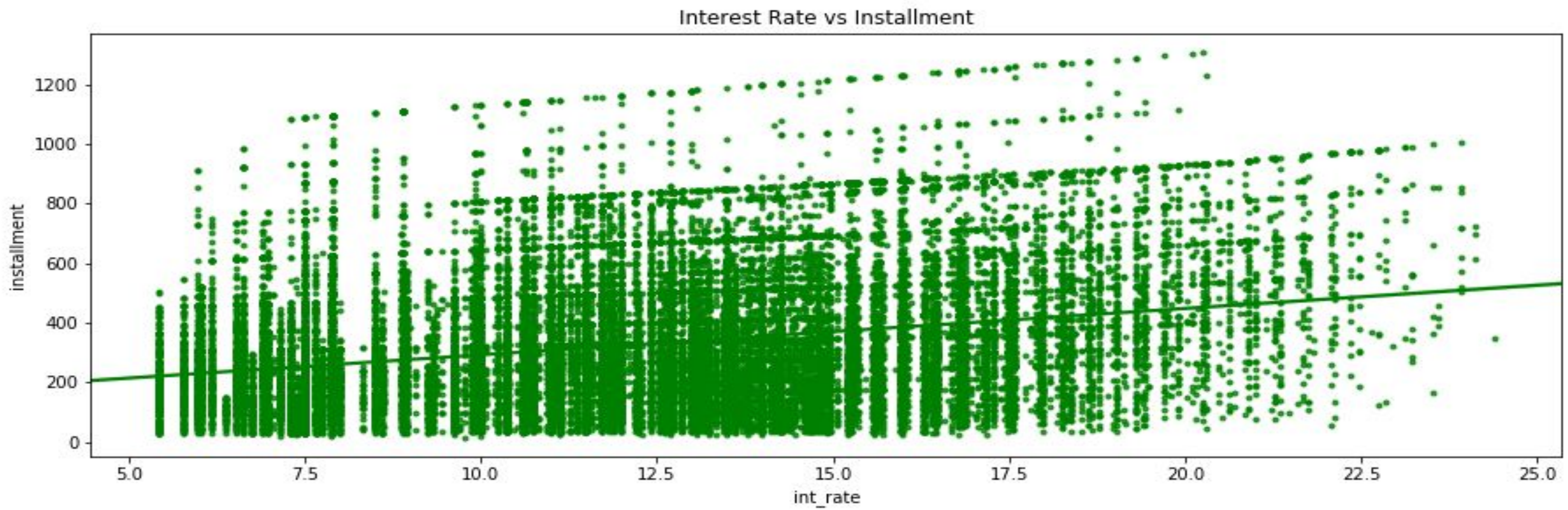




Observations:

- We saw that as the Grade rises(safer to Riskier), the Charged Off ratio rises. **This states that such loan applicants having riskiest grade will opt to Charged Off.**

- When compared to Interest rate, its same scenario, **where interest rate is high when grade is rising(goes to riskiest).**



	term	loan_status	installment	int_rate	dti
0	36 months	Charged Off	254.48	12.53	14.00
1	36 months	Fully Paid	262.18	10.95	12.93
2	60 months	Charged Off	345.59	15.99	14.83
3	60 months	Fully Paid	317.04	14.27	14.22

By Keeping the DTI on stable/consistent;

For term 36 months or 60 months, and compared to interest rates, higher the interest rates, then higher the Charged Off likelihood.

For installments, and compared to interest rates, higher the interest rates and higher installments , then higher the Charged Off likelihood.

6. Insights and recommendations

- For term 60 months, the Lending club must reduce the interest rates which will reduce the chances of getting Charged Off.

- If the interest rates are same, then charge off rate decreases with increase in annual income.
  For the same dti, higher interest rates result in more charge-offs.
  The interest rates must be reduced little so that borrowers won’t be Charged Off.

- Grade act as good indicator when interest rate comes along. The lending club needs to make sure that they give loans to safe graded borrower's loan application.

- Small Business and renewable purpose for loan must go under more checks/scrutiny as they have high chances to Charged Off, such as Annual income.

- Borrowers with high number of public derogatory records and public bankruptcy have high tendency to get Charged Off. The Lending club must ensure that there no records present when loan to be provided.

- It is good to have employee title for income verification, when employment title is provided employment length should be expected. This will allow a higher scrutiny, as verification status as alone is not enough to borrowers getting avoid Charged Off.