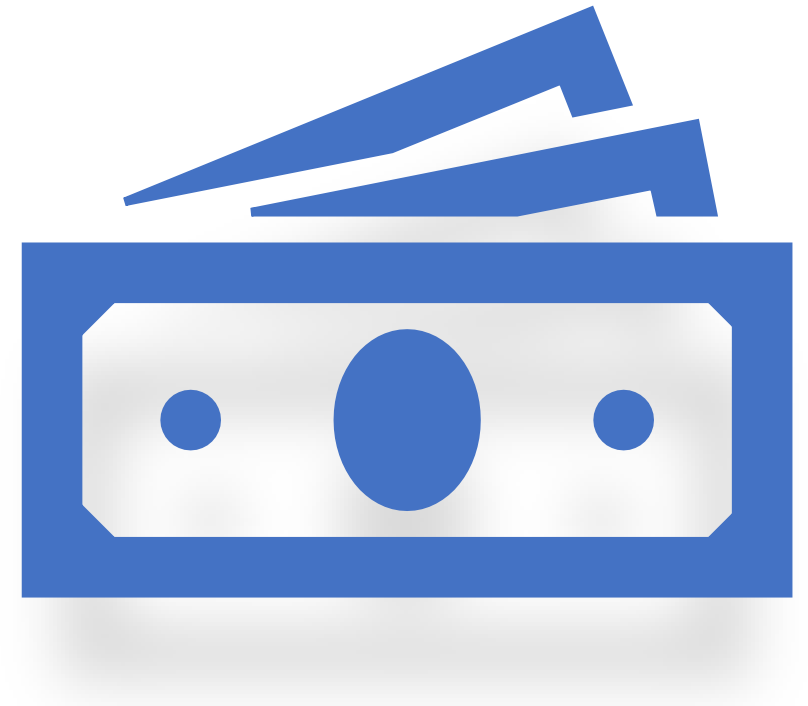


# Lending Club Analysis

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# Abstract

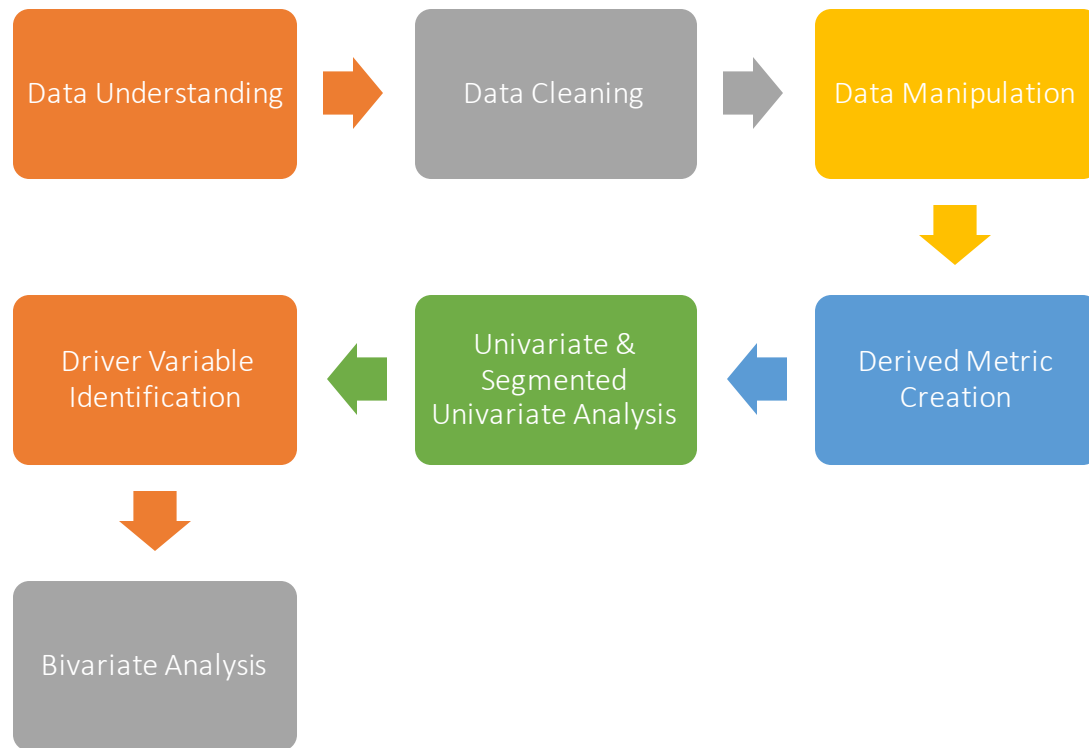
## Business Understanding

- Lending Club an online peer-to-peer lending platform for loans amounting up to \$35000 (currently \$40000)
- Applicants have to submit name, dob, amount required, annual income, address
- LC (lending club) fetches applicants credit history using name , address and dob.
- If accepted a grade is assigned and corresponding to that an interest rate is provided. The applicant then can take the offer or reject it.

## Objective

- The main source of loss for LC is unpaid loans.
- Main objective of this analysis , is to identify variables that are strong indicators of loan getting charged off
- Also, to provide insights that may help in policy improvement for LC

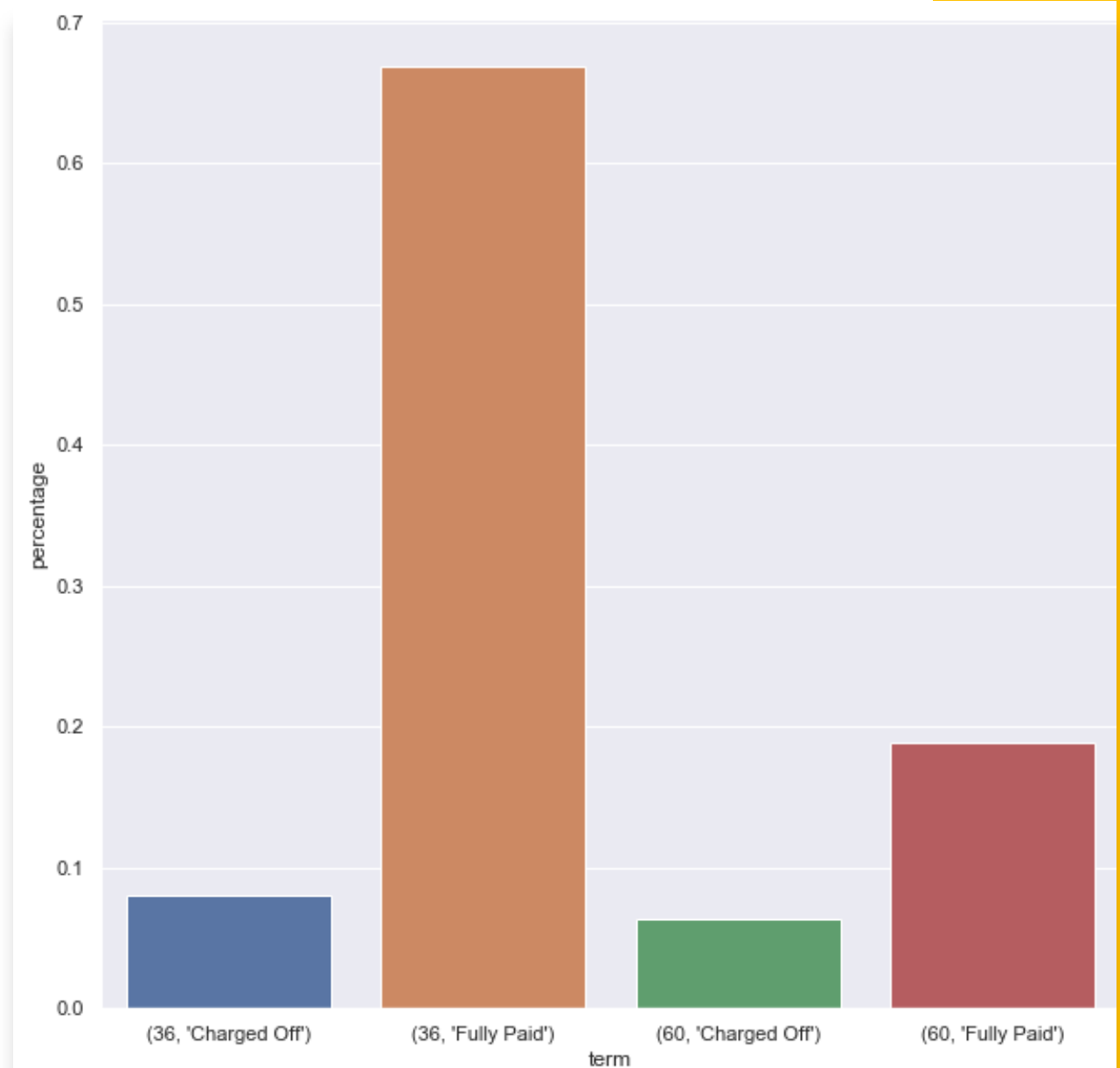
# Analysis Methodology



1. The data understanding phase involved exploring the data and understanding how lending club performs business.
2. Understanding the risk analytics domain
3. Using the knowledge of from (1) and (2) to select only the relevant columns
4. Data manipulation, derived metric creation and univariate (including segmented) has been done column-wise
5. Driver variable identification involves summarizing the observations from (4)
6. Lastly important combinations of the driver variables are analyzed together, to understand the effect on each other

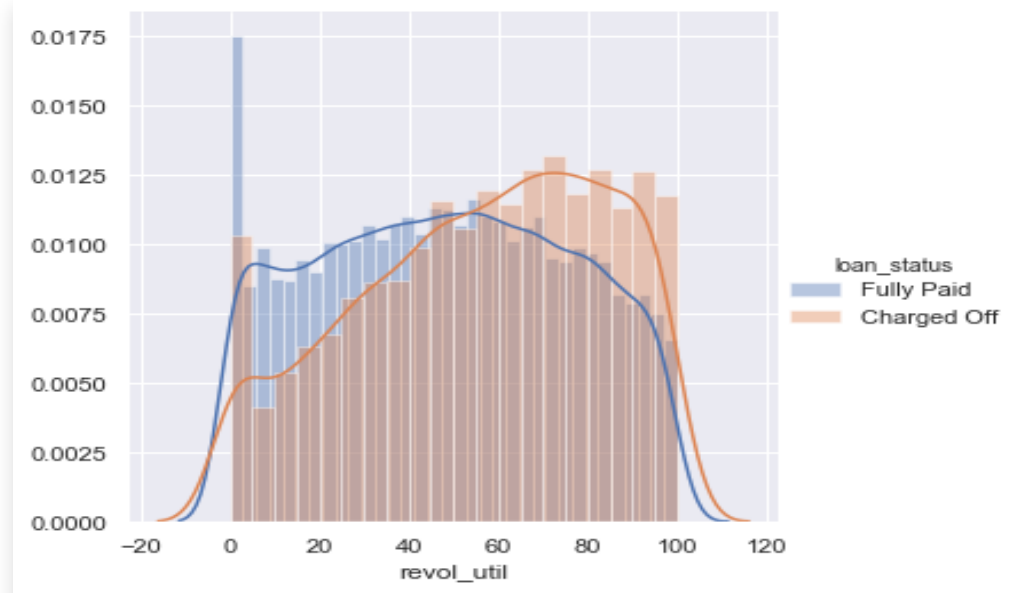
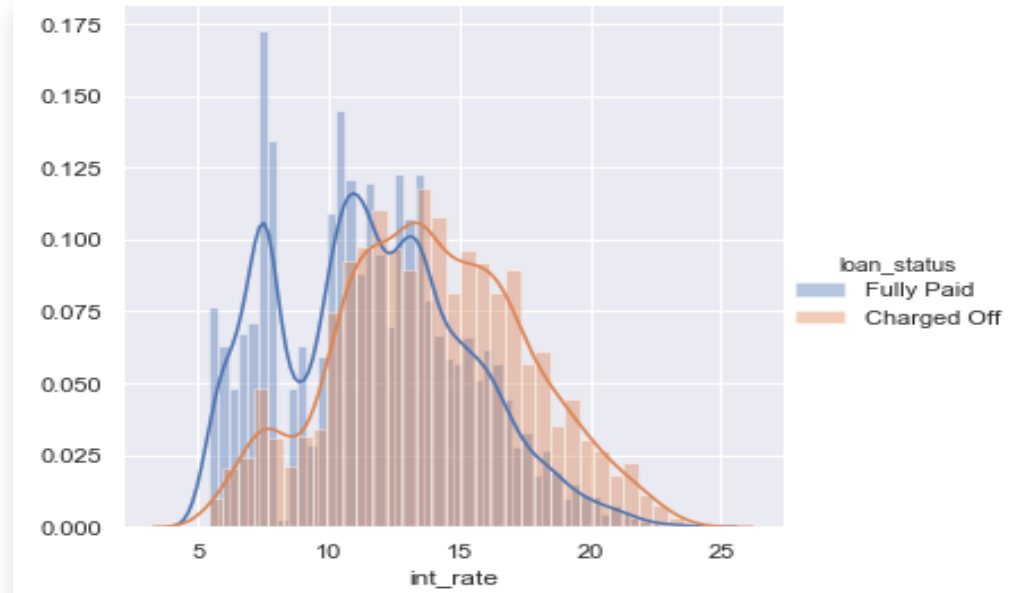
# Univariate Analysis

- We found several driving variables for charged off loans
- The first one is term of loan. Currently there are two available terms 36 months and 60 months
- It is seen that almost 70 percent of loans issued by LC belong to 36 months term
- But almost 50% of charged off loans comes from 60 months term



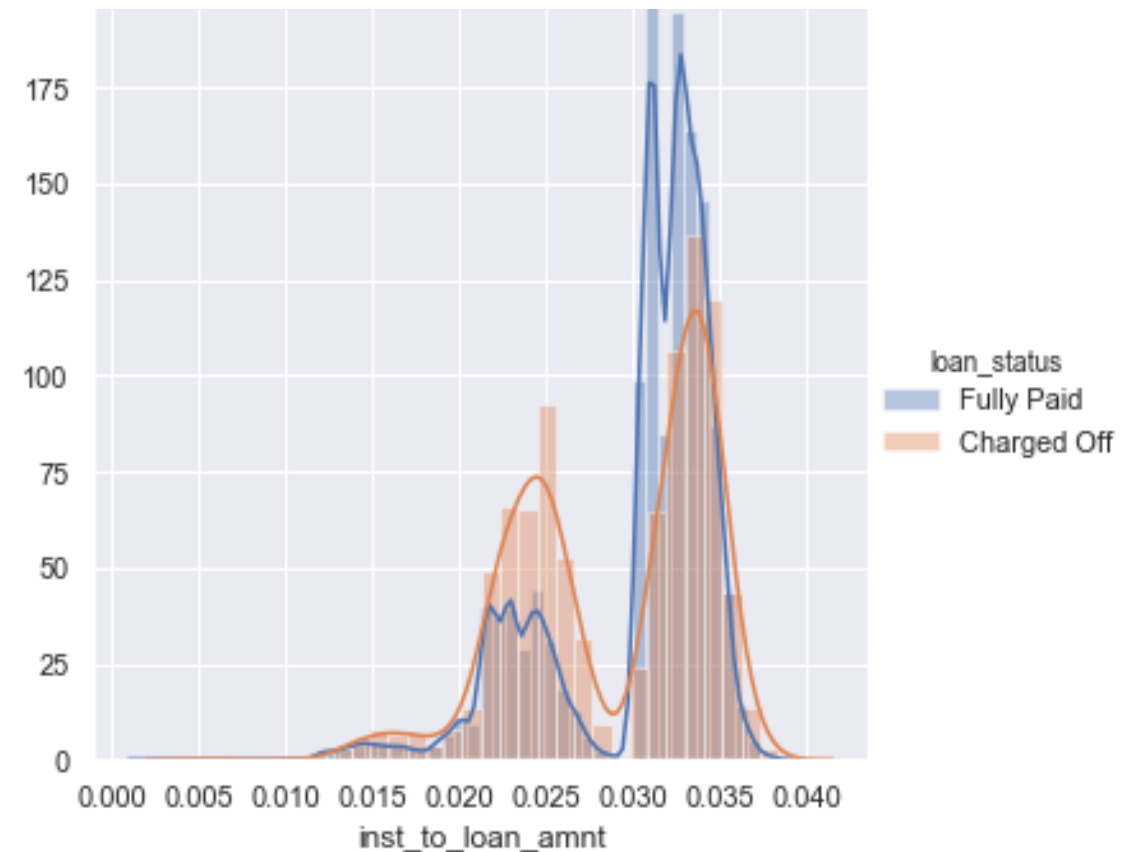
# Univariate Analysis (contd.)

- The next two important driver variables are interest rate and revolving balance utilisation rate
- We observed a marked increase in charge off rate at higher interest rate (greater than 14%) while a reduction in charge off for less than 10% interest
- Similarly higher revolving balance utilisation rate (>50%) showed a increases in charge off rate



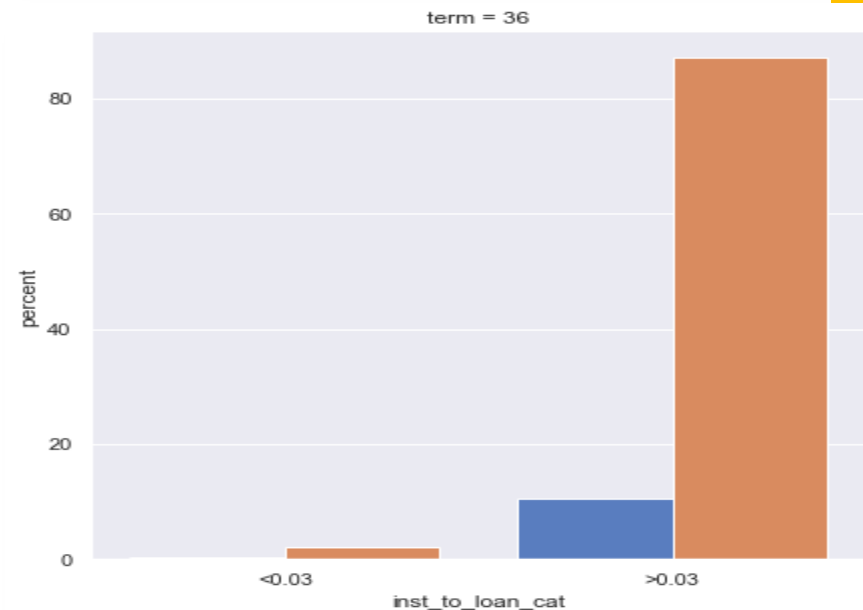
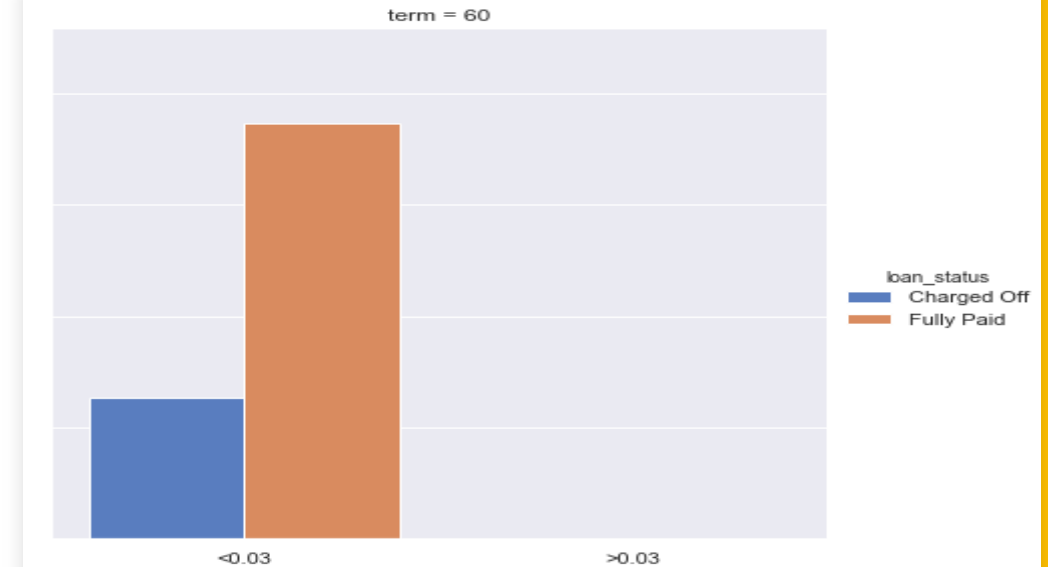
# Univariate Analysis (contd.)

- We found the **ratio of installment to loan amount** (inst\_to\_loan\_amnt) having a profound impact on charge off
- Any value of the ratio lower than .03 showed a large increase in charge off number over fully paid
- While values higher than 0.03 have much higher percent of fully paid loans
- The other variables found having a strong effect (although lower than those mentioned till now) are **debt-to-income ration (dti), loan amount , annual income and grade**
- The **grade** variable must be mentioned seperately as it is derived by LC after assesing risk of loans. Consequently, it has high impact on charge off



# Bivariate Analysis

- If we see the plot between term and inst\_to\_loan (image attached), we see that in 30 months almost all loans have greater than 0.03 installment to loan ratio. While 60 months term has all loans with inst\_to\_loan ratio less than 0.03
- Plotting loan amount and revolving balance utilization, we observe that for loans higher than \$25000  $\text{revol\_utl} > 50$  causes a much higher charge off rate
- Plotting interest rate and grade, we see that all loans having rates higher than 16 percent belong to grades D, E, F and G only.
- Plotting annual income and interest rate, we see higher interest rates result in more charge off across all income groups. But lower interest rates have almost no charge off for higher income group.



# Bivariate Analysis (contd.)

- Plotting income category and loan amount, we see that group with income less than \$40000 majorly apply for loans <\$15000 (almost 80%) and have very low charge off. With increase in income number of higher value loans (>\$25000) increase.
- Also charge off rate is lower for high income category
- Plotting term and loan amount , we see that for 36 months term most loans are <\$15000 (about 75%). In 60 months term loans of higher amount >\$25000 increases(from 0 to 8%) but they have comparatively high charge off (3%).
- Plotting term and annual income we see, in both terms 40000-80000 category are the highest borrower accounting for about 40 percent. Only 5 percent charge off is noticed in 36 months term, while 15 percent charge off in 60 months term



# Conclusion

- We have identified the following strongest driver variables for identifying charged off loans: term, grade , interest rate, revolving balance utilisation , installment to loan amount ratio.
- Loans of 60 months term (specially with loan amount greater than 25000) are much more likely to get charged off
- Loans of grades A and B are very safe, while E and F are very unsafe
- Higher interest rate loans(>16 percent) are very likely to be charged off and are always in D,E,F or G grades
- Installment to loan amount ratio has a huge impact and any value lesser than 0.03 makes the loan likely to be charged off.
- Revolving balance utilisation denotes the loan payoff rate of the applicant. Higher the value more likely the applicant is to charge off. Currently a high percentage of high value loans given out have higher revol\_utl.

# Suggestions

- Introduce a new term between 3 and 6 years, such that installment to loan amount ratio is greater than 0.03 for most of high value loans
- Introduce special lower interest slabs for applicants with high income
- For high value loans , applicants with higher percentage of revolving balance utilization rate should be checked more stringently
- Although company is charging high interest for loans of category D,E,F,G the charge off rate is quite high (almost 40 percent of the number of loans). So, the company can introduce a cutoff on the number of loans belonging these categories accepted each financial year