

# Lending Club Case Study

## SUBMISSION

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# Lending Club Case Study

## **Introduction:**

Lending Club (LC) is the world's largest peer-to-peer lending company, headquartered in San Francisco, California ▪ It was the first peer-to-peer lender to register its offerings as securities with the Securities and Exchange Commission (SEC), and to offer loan trading on a secondary market.

## **How it Work's:**

- Customers interested in a loan complete a simple application at [LendingClub.com](http://LendingClub.com).
- Lending Club leverages data and technology to screen borrowers, facilitate the transaction with appropriate interest rates, and service the loan.
- Qualified applicants receive loan offers and can evaluate their options with no impact to their credit score.
- Investors select the loans they want to invest in based on their own risk tolerance, investment portfolio goals, and time horizon.

## **Objective :**

- Identify variables that provide strong indicators of potential loan default thus helping Lending club to decide approval/rejection of loan.

# Data cleaning steps

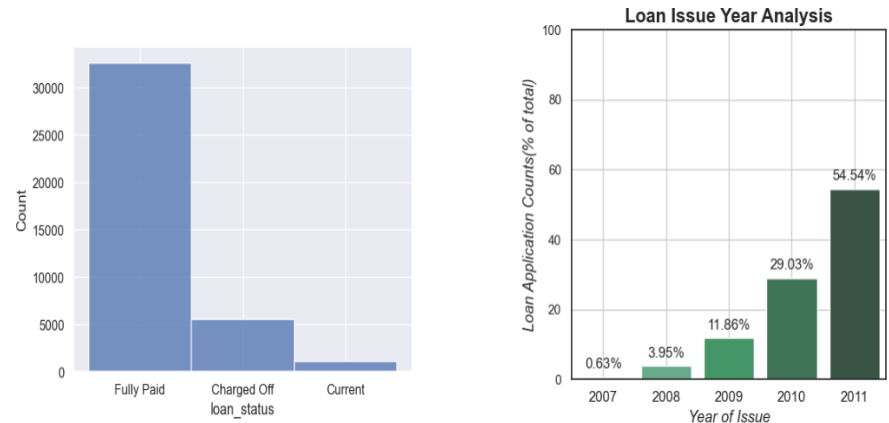
- Delete columns: Delete unnecessary columns.
- Remove outliers: Remove high and low values that would disproportionately affect the results of your analysis.
- Missing values: Treat missing values with appropriate approach.
- Duplicate data: Remove identical rows, remove rows where some columns are identical.
- Filter rows: Filter by segment, filter by date period to get only the rows relevant to the analysis

# Analysis

- The essence of the whole project is to analyze and understand how consumer attributes and loan attributes are influencing the tendency of defaulting.
- We performed data cleaning and preparation on the Loan dataset:
  - Imputed the NA values for all the variables
  - Created two new columns:
    - Profit and Loss column
    - Ratio of funded amount and annual income
- During univariate analysis we have created:
  - Histograms and Bar charts to check out the distribution of all the driver variables
  - Box plots to detect the Outliers
  - Performed the Multivariate analysis to understand how different variables interact with each other.

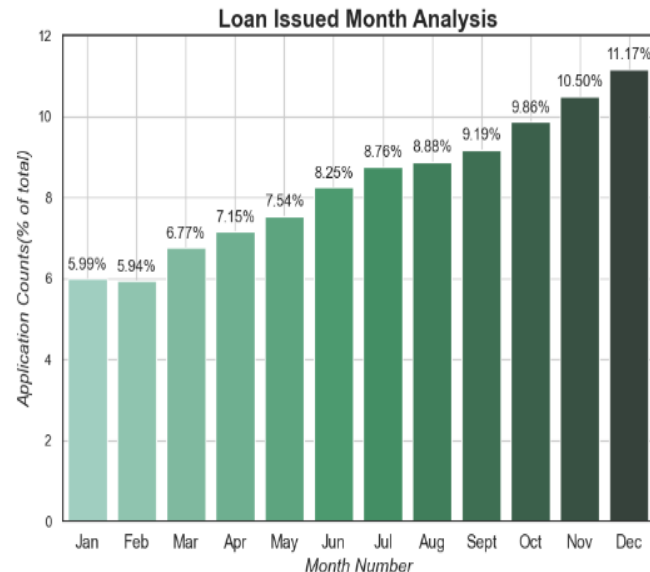
# Univariate Analysis: Insights

- Overall Default Rate stands at 14.59%.

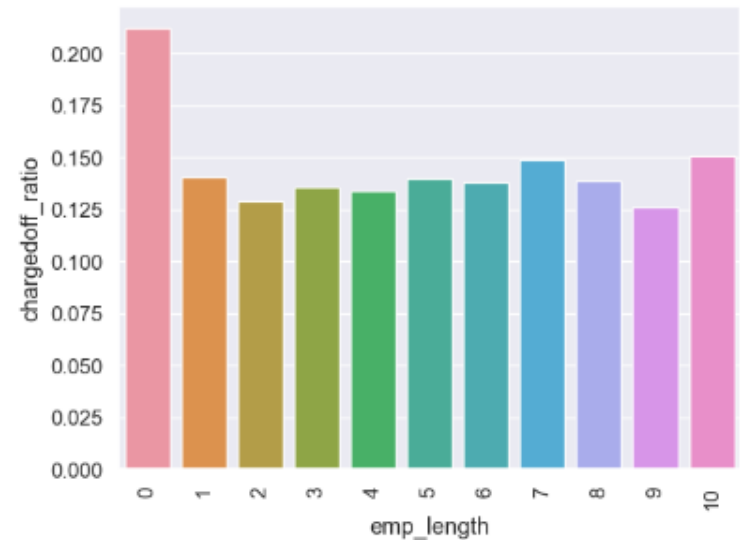
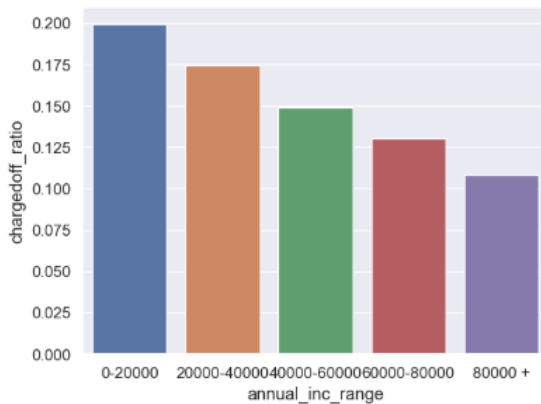
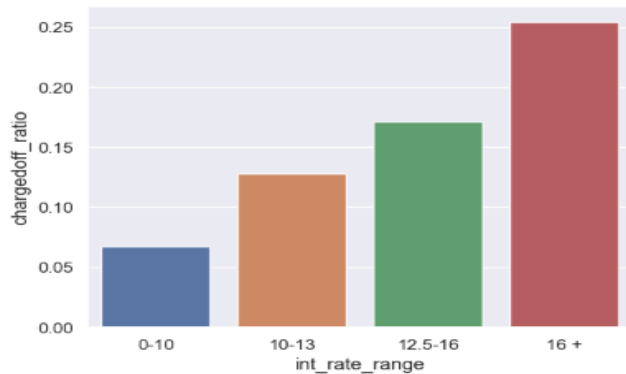


## Ordered categorical Variables

- Approval Rate of loans is higher during the Holiday Season (November & December).
- Approved Loan amount almost doubled between years' 2010 and 2011.



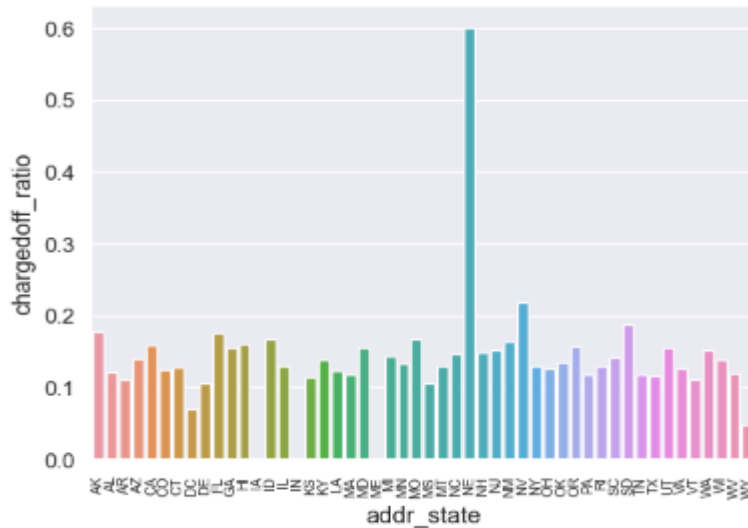
# Bivariate Analysis: Insights



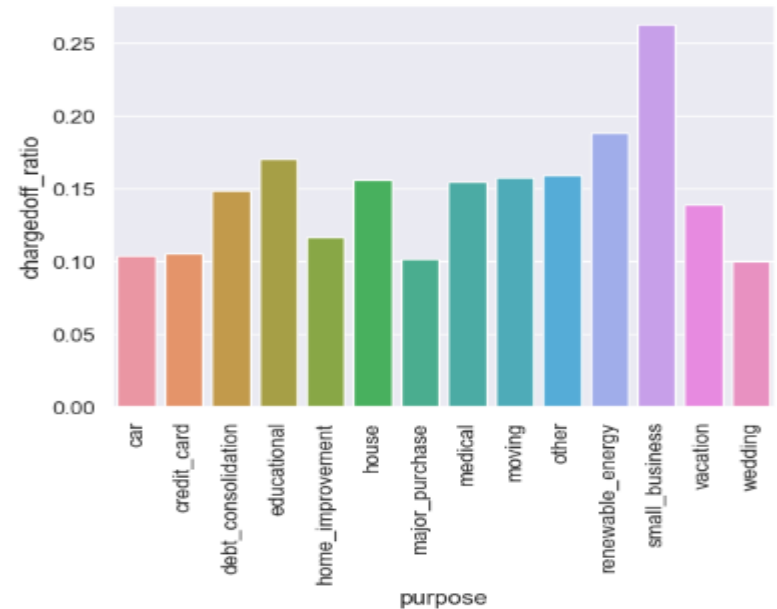
- Charged off ratio increases with interest rate.
- Highest charged off ratio is on zero employee length.
- Annual income of first group between 0-20000 have more charged off ratio. And it reduces with increase in annual income

# Bivariate Analysis: Insights

- State vs Charged off

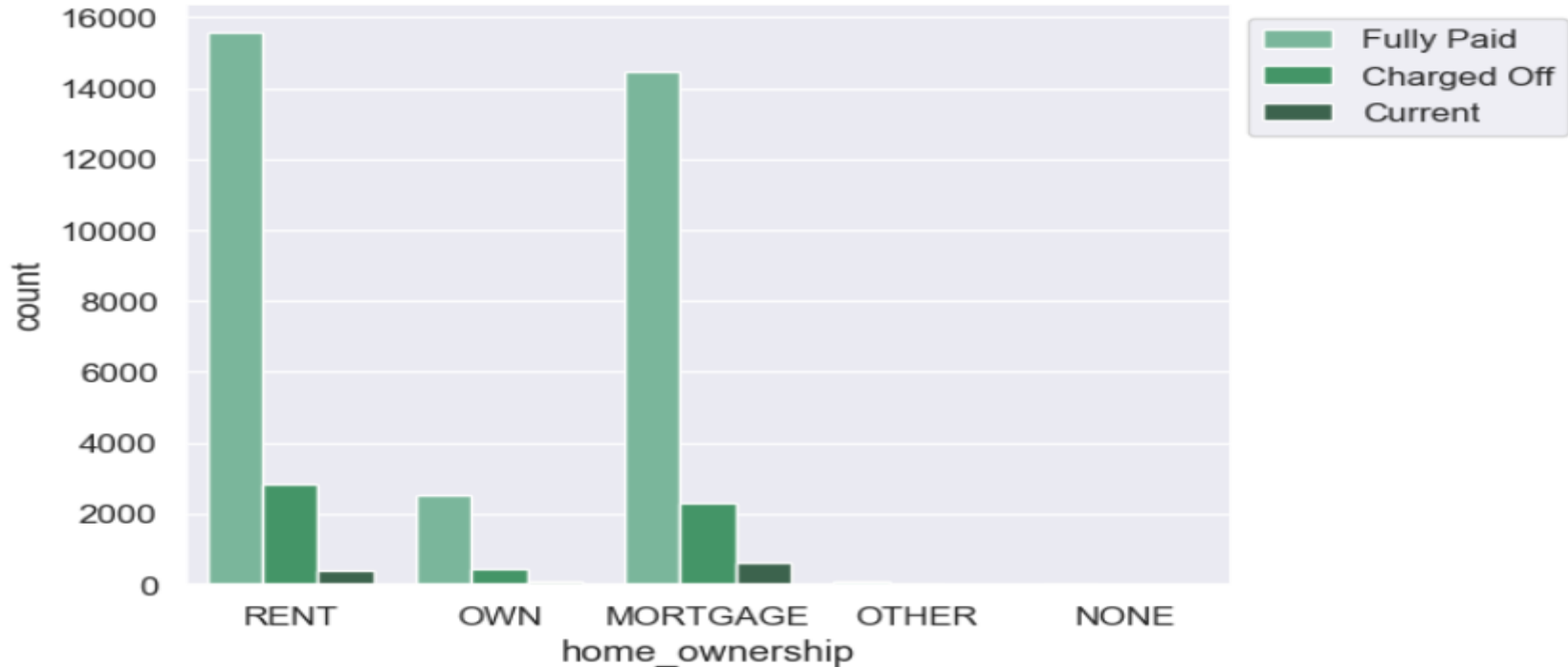


- Loan purpose analysis



- Small business followed by renewable energy , are the top charged off purposes .
- NE has more than twice as many charged off ratio as compared to any other state.

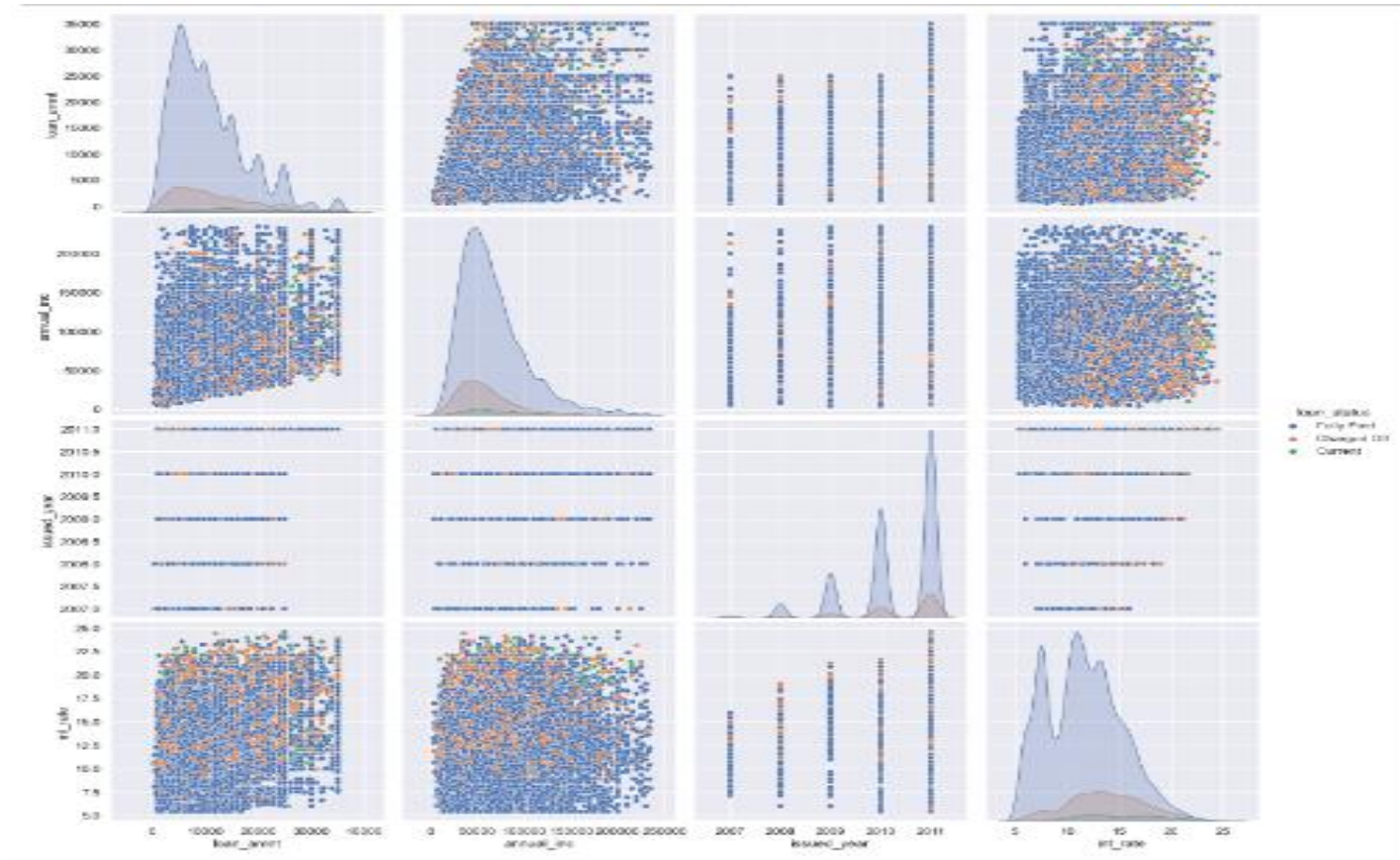
# Bivariate analysis insights



- 91 % of the defaulters already have a mortgage taken out or live on rent.



# Multivariate Insights



Pair plot in variables loan amount ,annual income, issued year, Interest rate with loan status (Fully paid, charged off, and current)

# Conclusion

## **Driving Factors (or driver variables):**

- Annual Income :- Applicants from 'Low'(0-20K) and 'Medium'(40-60K) income group have a greater share of defaulted loans.
- Employment Length : Maximum number of defaulters have experience 0 to 2 years of experience and 10/10+ years of . Hence, LC should be take this aspect into consideration while lending loans.
- Loan Purpose :- The top two reasons for loans are small business and renewable energy. Such applications should be carefully assessed.
- Address state:-Applicants from state NE has more defaulted or charged off Ratio.
- Interest Rate:-Charged off ratio increases with interest rate.