

# Lending Club case study

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# Case Study Summary

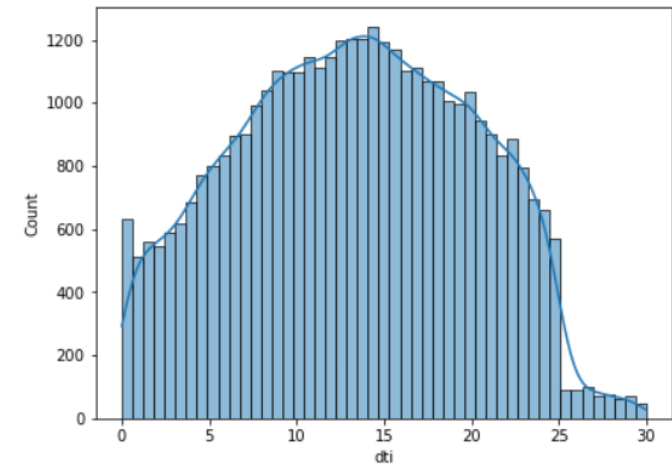
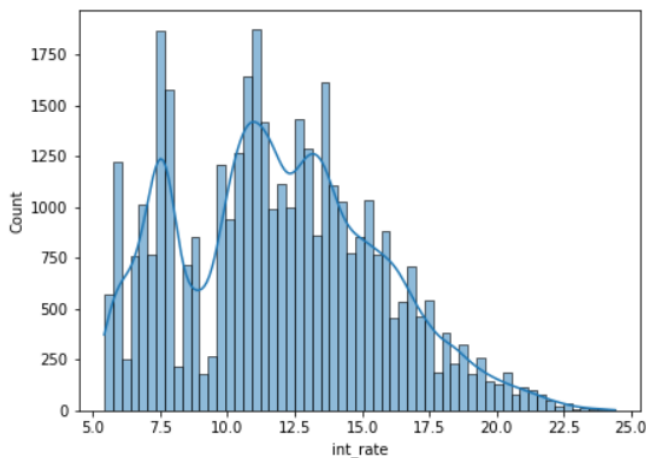
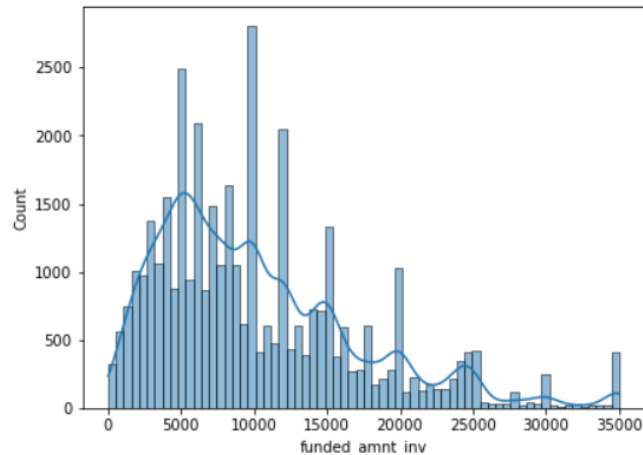
- ❖ Built understanding of the objective and different features in the
- ❖ Addressed the data quality issues including missing values and outlier treatment
- ❖ Univariate analysis of categorial and continuous variables
- ❖ Derived new features from the data as per the domain understanding
- ❖ Bivariate and segmented analysis with target and different features
- ❖ Identified key metrics and patterns leading to Charge off

# Data Cleaning and Manipulation

- ❖ Dropped the features having less than 20% fill rate
- ❖ Dropped the user behavior features which are not available before issuing the loan
- ❖ Dropped the records with current loan status
- ❖ Converted the data types of the features as per relevance
  - ❖ interest rate, loan term to float from object
  - ❖ Date fields to date from object
  - ❖ Created new columns with interest bins and funded\_amnt\_inv bins, and DTI bins.
- ❖ Missing value imputations

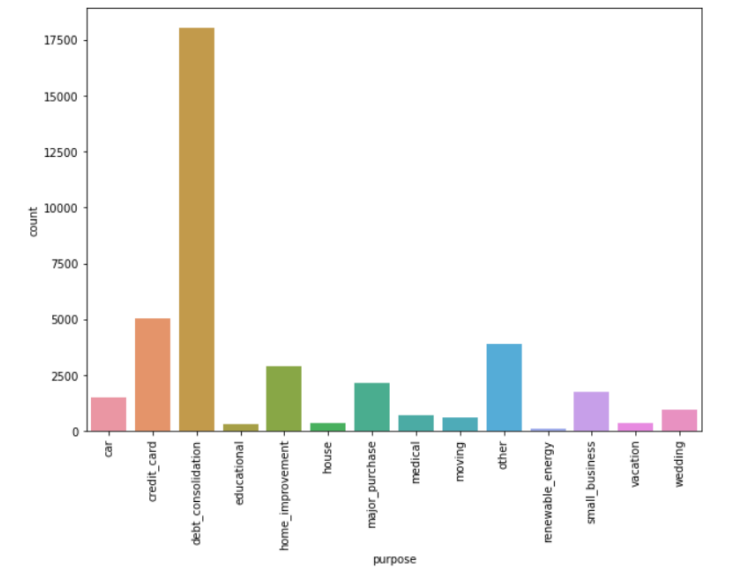
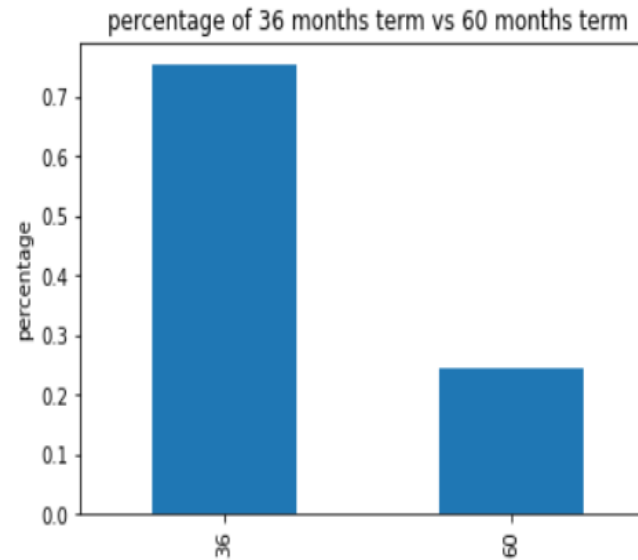
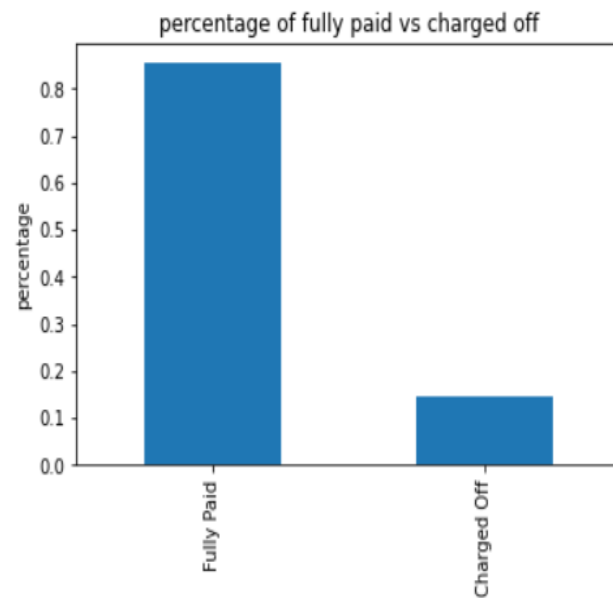
# Univariate Analysis - Continuous Variables

- ❖ Highest distribution of Issued amount lies is between 5000 to 15000.
- ❖ Highest distribution of Installment amount lies between 200 to 500.
- ❖ Highest distribution of interest rate lies between 10 to 15.
- ❖ Highest distribution of DTI lies between 8 to 18.
- ❖ A lot of features are quite skewed including annual income.



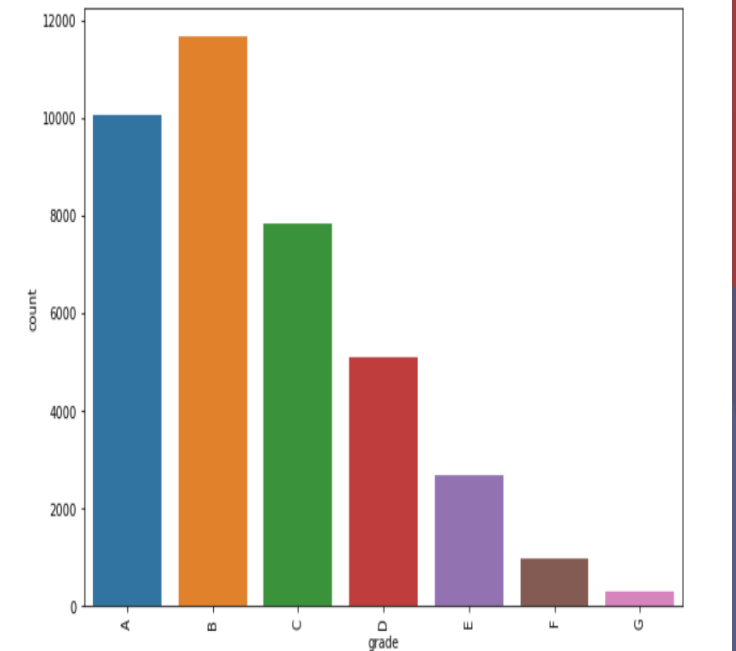
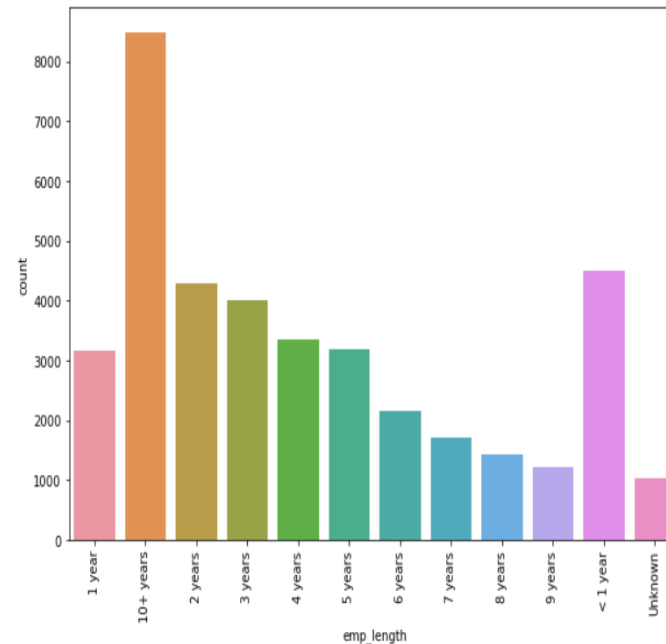
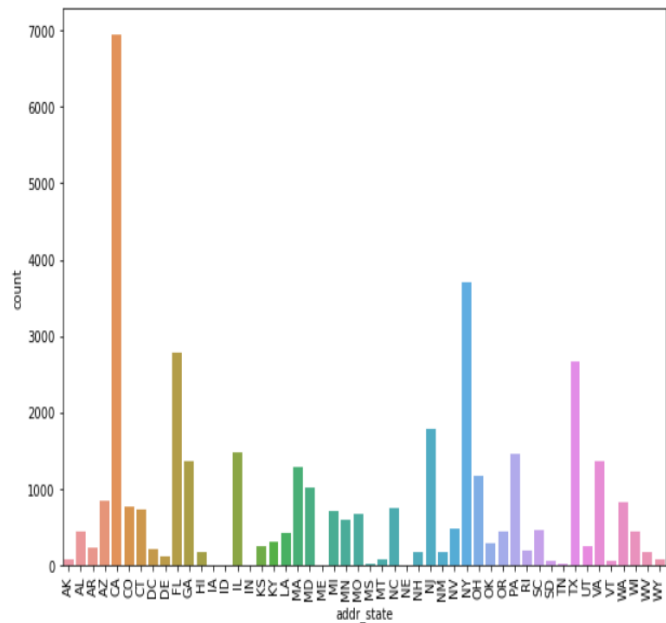
# Univariate Analysis - Categorical Variables

- There are around 15 percent charged off loans
- 76% of loans term is 36 months rest are 60 months.
- Most number(~17500) of loans are taken for debt consolidation



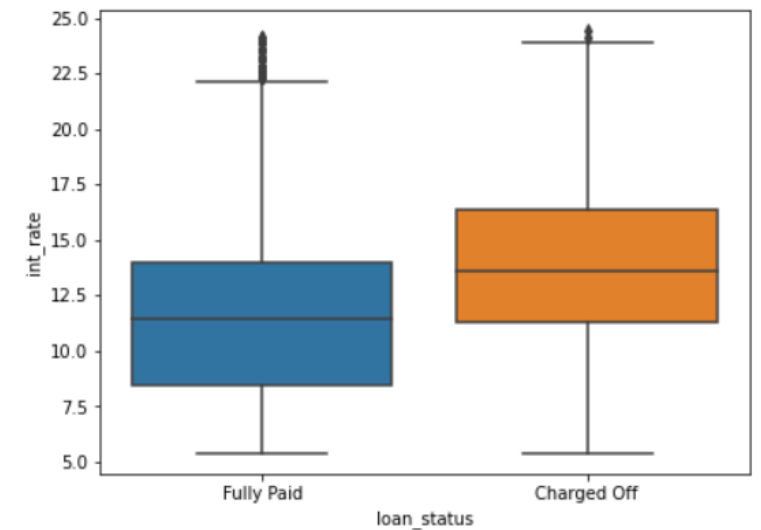
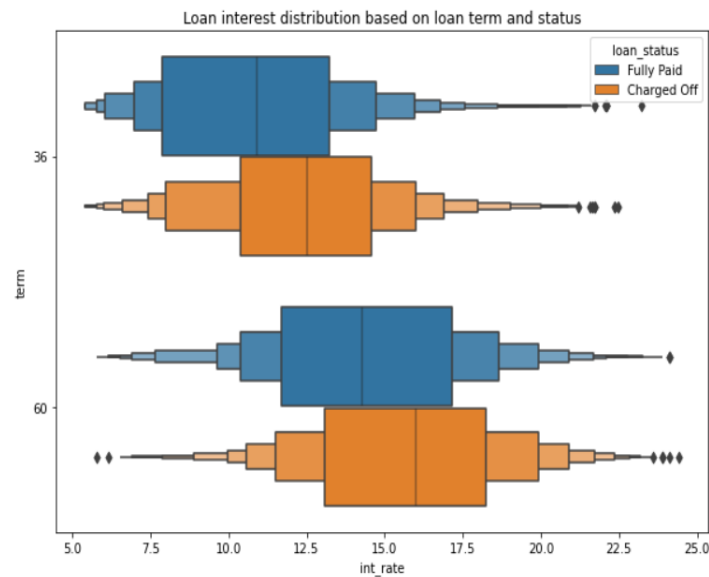
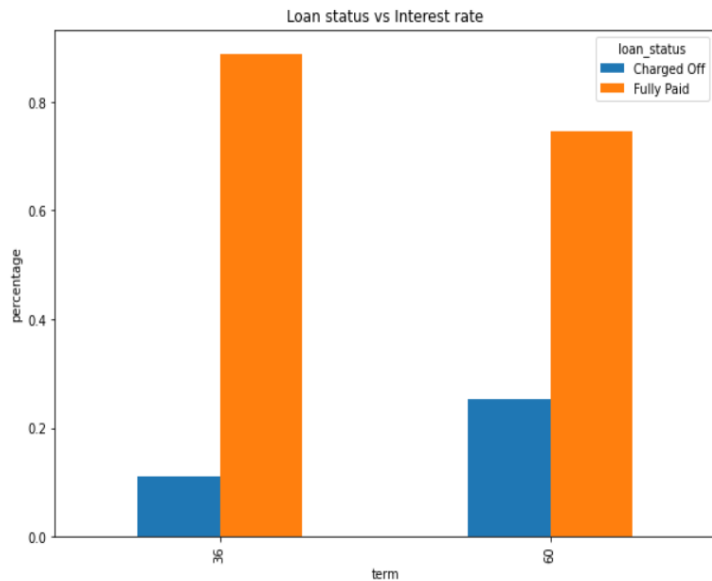
# Univariate Analysis - Categorical Variables

- States CA, NY, FL, Tx has highest number of loans.
- Most number of loans are given to Grad A, B, C, D.
- More number of loans are given to people with 10+ years, 1 year, 2 years experience respectively.



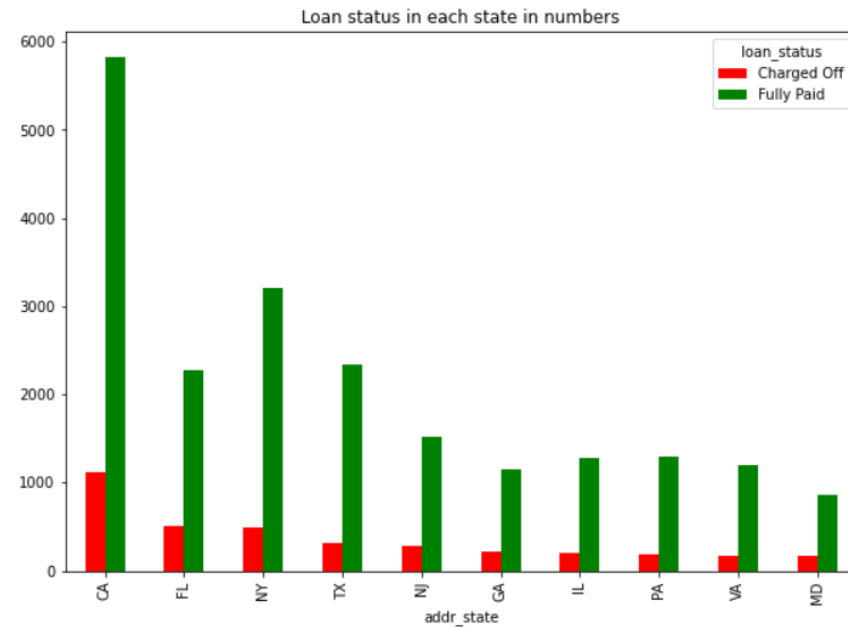
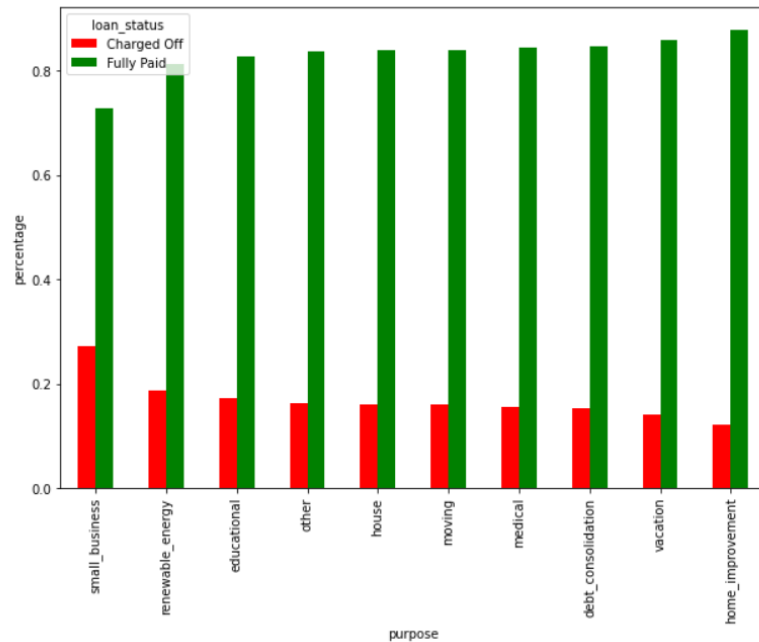
# Bi-variate and Segmented analysis

- If the loan term is 60 months, then there is more chance of being charged off.
- Interest rate is also higher for 60 months compared to 36 months term.
- On an average Charge off loans have higher rate of interest.



# Bi-variate and Segmented analysis

- Loans taken for Small business has a high percentage of charge offs.
- NE State has the highest charged-off percentage(almost 60 percent).
- CA State has a large number of charged-off loans.



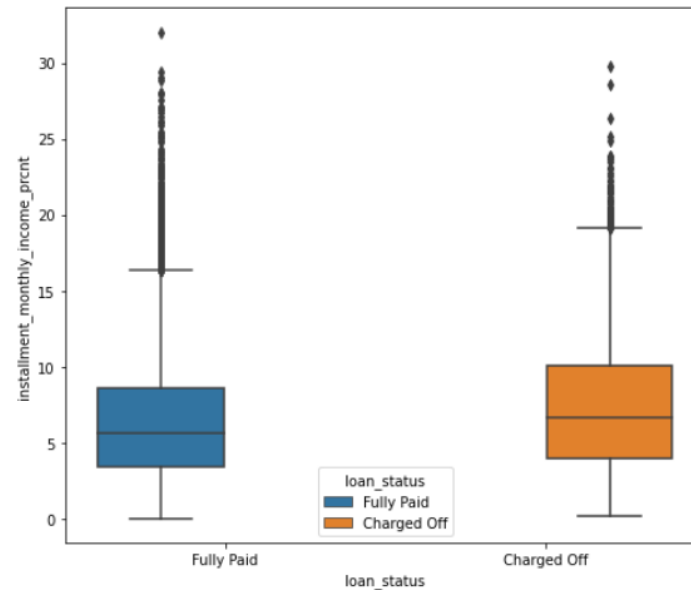


# Bi-variate and Segmented analysis

- Grades E, F, and G have high-interest rates and percentages of charged-off loans.
- If we look into subgrades F5 and G3 have more than 40 percent charged off loans.
- If pub\_rec\_bankruptcies is high, then also there is more chance of being Charged off.
- Charge-off percentage is slightly high(~2-4) for DTI range is between 15 to 27.
- Charge-off is slightly high if the loan amount is greater than 30K.
- Employment length “unknown” has a 20 percent of charged off loans.

# Feature Engineering

- Calculating the difference amount of funded\_amnt and funded\_amnt\_inv. Issuing more/less loan amount than approved amount doesn't have any effect on charged off.
- Calculated the percentage of installment in monthly income. If the Installment to Monthly income percentage is more than ~8%, the chances of charge off increases



# Conclusion

- High interest is directly related to high charge off, can try reducing the interest rate
- Should issue loans carefully for E,F,G grades which has higher charge off percentage
- If the installment is over 8% of the monthly income, the chances of charge off are higher, can try keeping the installment percentage low
- Should issue loans carefully to people from NE state as they have ~60% charge offs.
- As people who took loan for small business has high chance of charge off, should be cautious while issuing loans to small business.
- Should also reduce the number of loan for CA State as it has more number of charge offs.