



Loan Lending Club Case Study

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Problem statement

- Lending Club is a marketplace for personal loans that matches borrowers who are seeking a loan with investors looking to lend money and make a return.

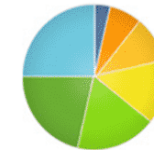
When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision:

- If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company
- If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company

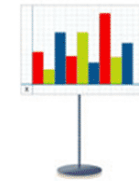
How Lending Club Works



Borrowers apply for loans.
Investors open an account.



Borrowers get funded.
Investors build a portfolio.



Borrowers repay automatically.
Investors earn & reinvest.

Business understanding

When a person applies for a loan, there are two types of decisions that could be taken by the company:

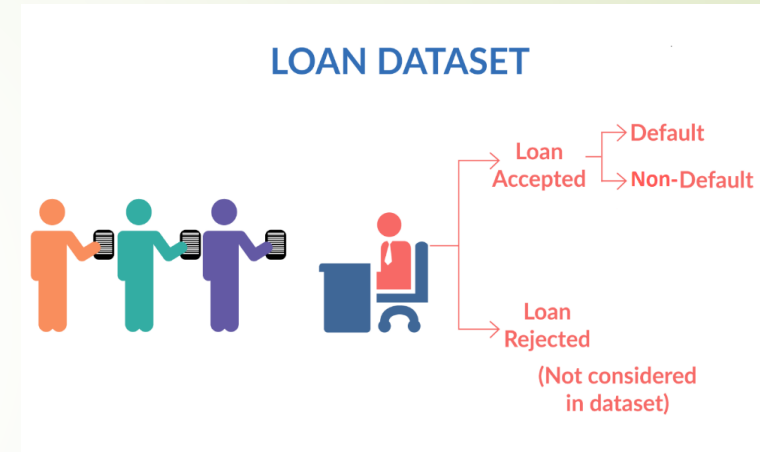
1. Loan accepted: If the company approves the loan, there are 3 possible scenarios described below: • Fully paid: • Current: • Charged-off:

2. Loan rejected: The company had rejected the loan (because the candidate does not meet their requirements etc.).

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





Risk

When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision:

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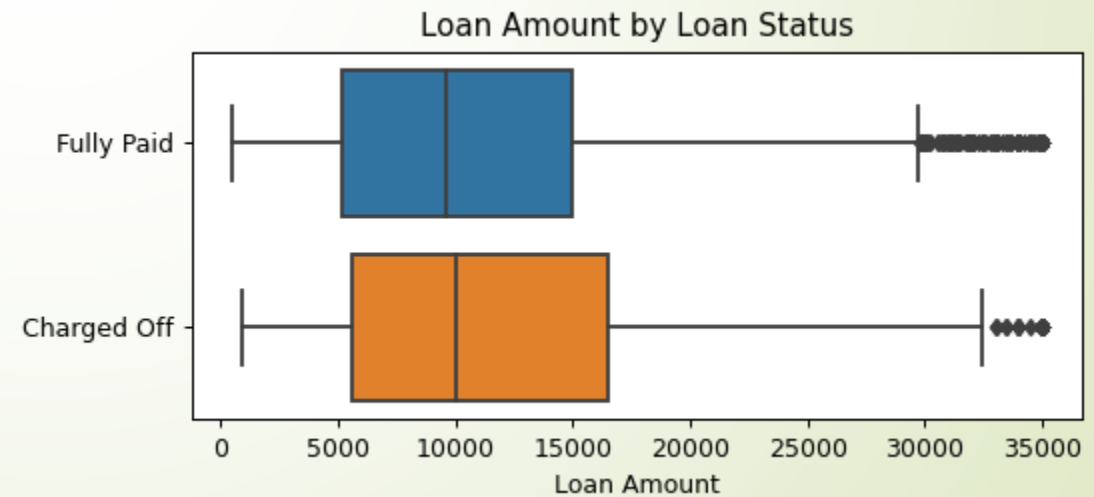
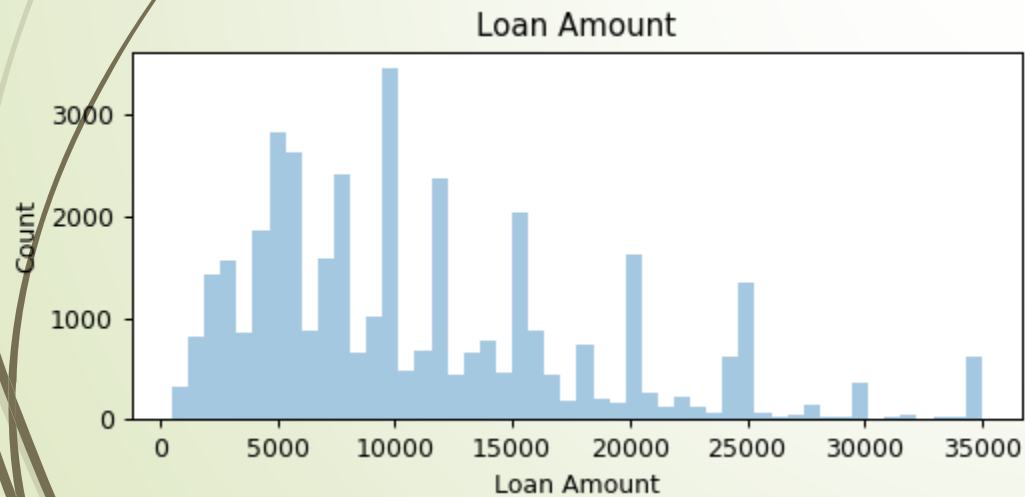
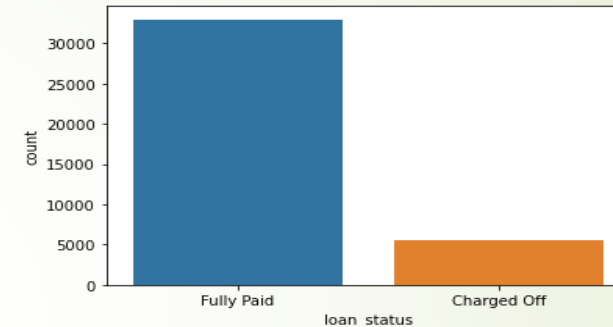


Data Analysis

Analysis on Loan Status and Loan amount

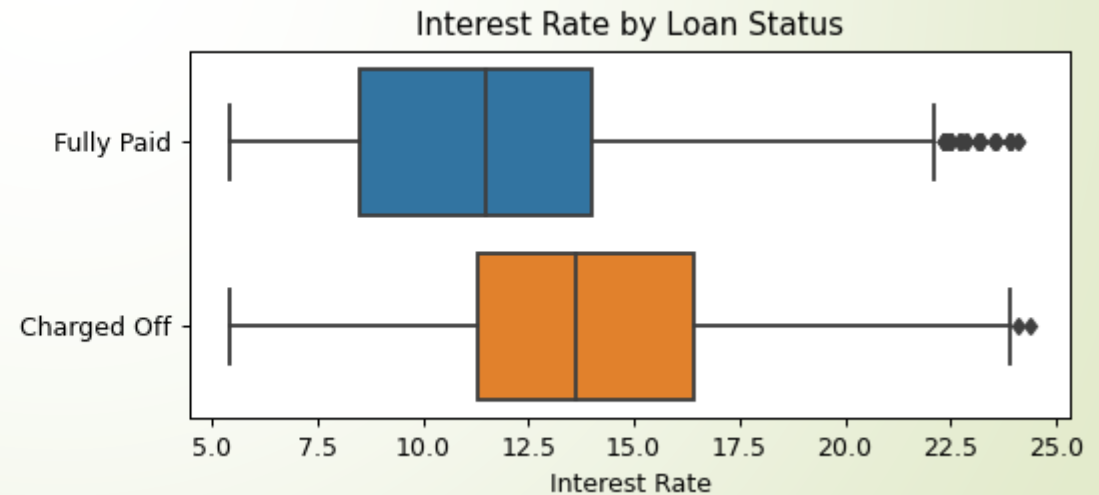
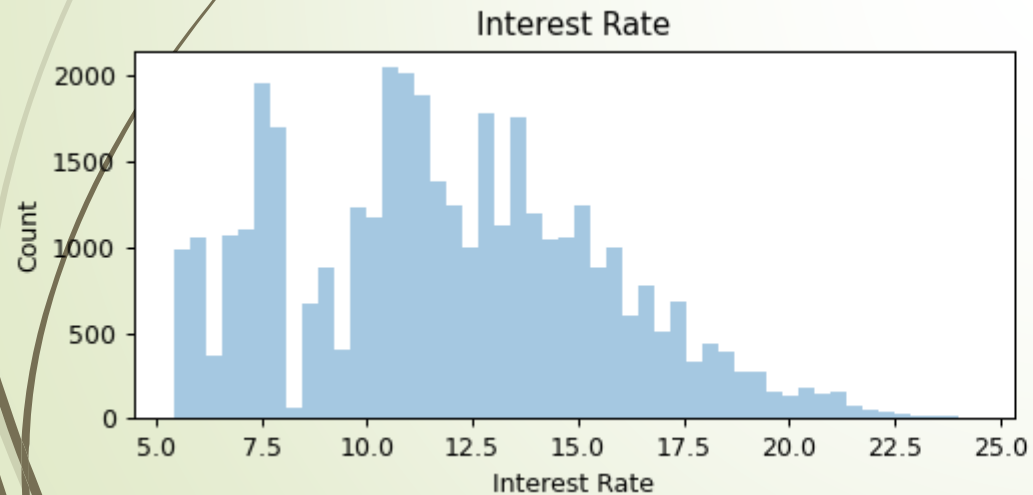
Loan status : Charged off Loan Percent - 14.58% and Fully paid Loan Percent - 85.41%.

Loan amount : Charged-off loans tend to have higher loan amounts when compared to fully paid.



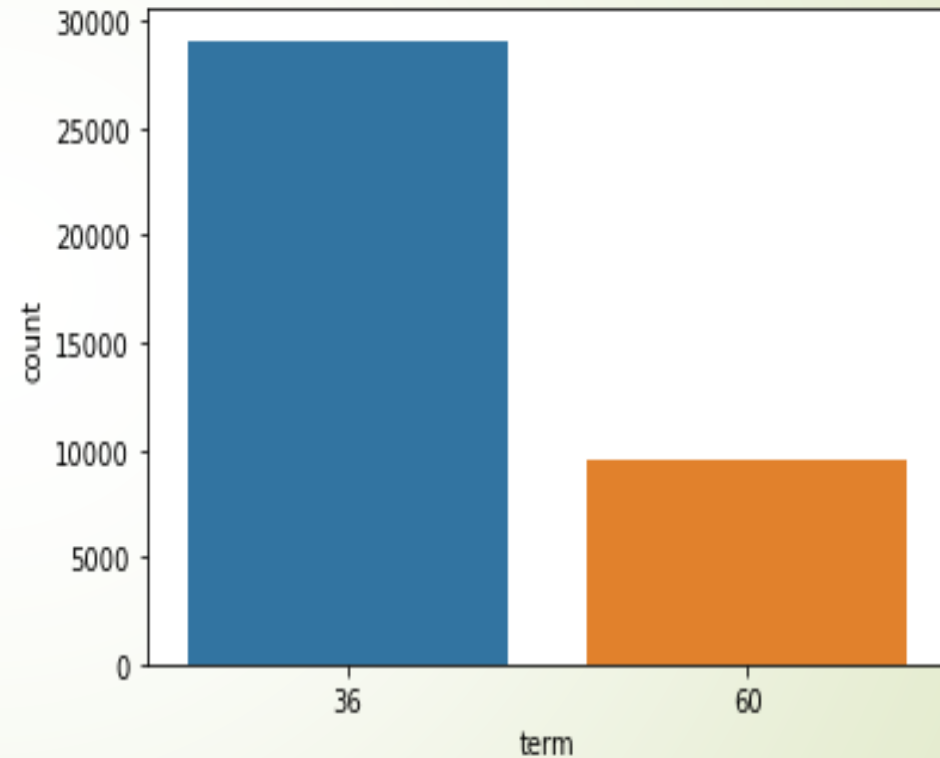
Analysis on Interest rate

- Interest rates range from 5.42% to 24.40% with a median of 11.71%.
- Charged-off loans tend to have much higher interest rates
- more than 50% of Charged-off loans have interest rate greater than 13%.



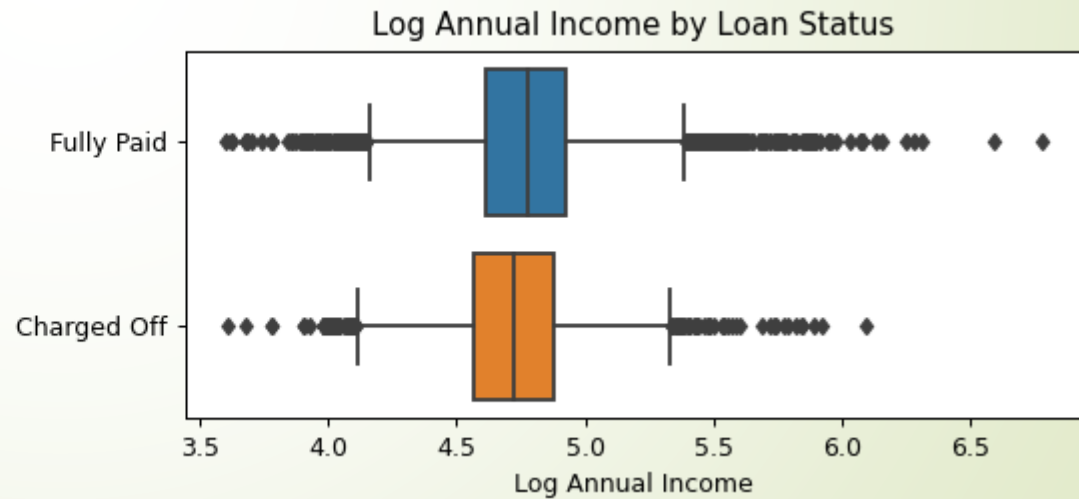
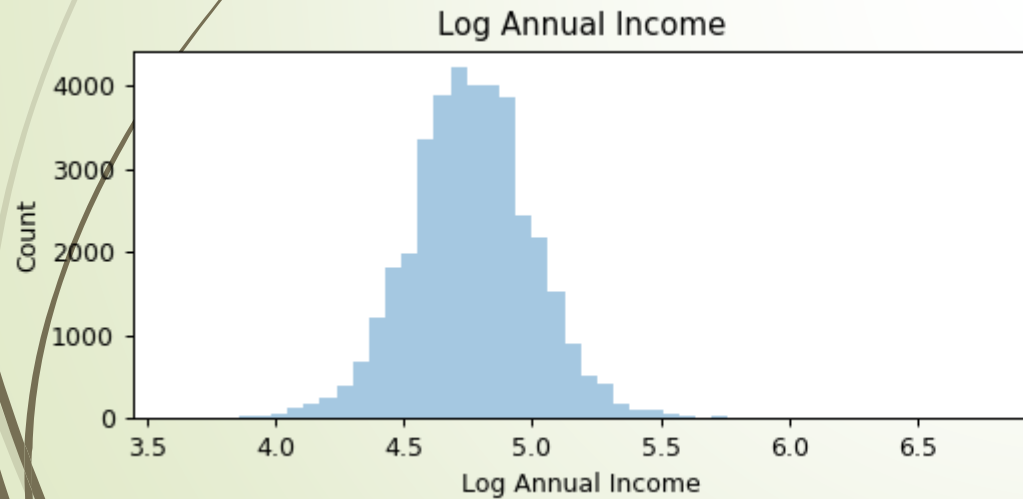
Analysis on Term

- The borrowers have taken more loans for 36 months term verses 60 months.
- The loan defaulted percent for 60 months term is twice that of 36 months



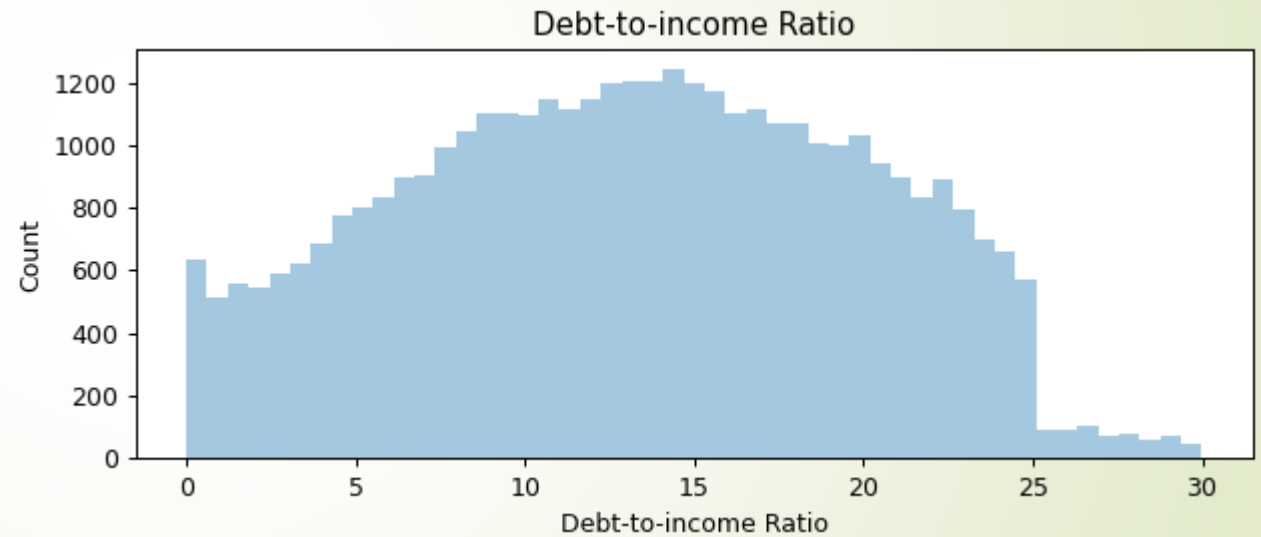
Analysis on Annual income

- It appears that individuals with higher income are more likely to pay off their loans.



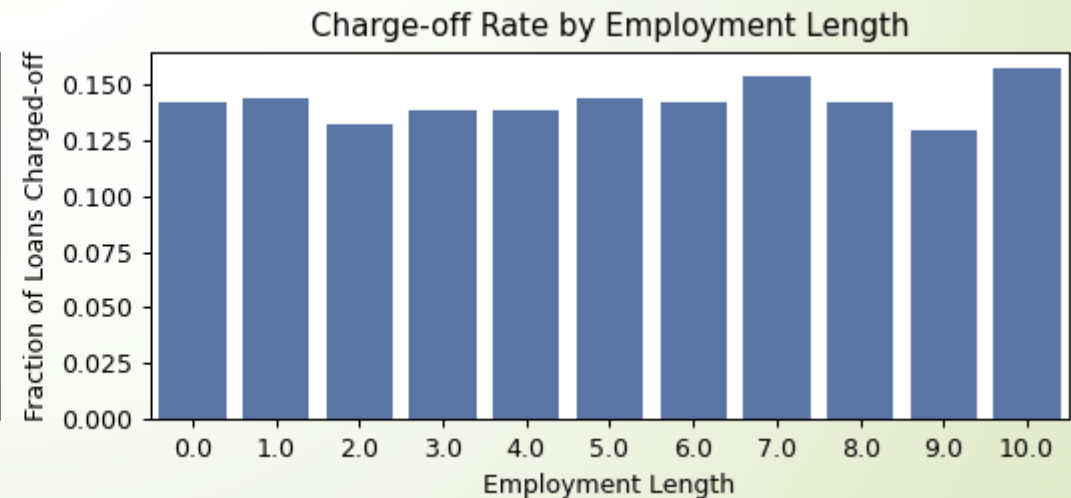
Analysis on DTI

- loans that are charged off tend to have higher debt-to-income ratios.



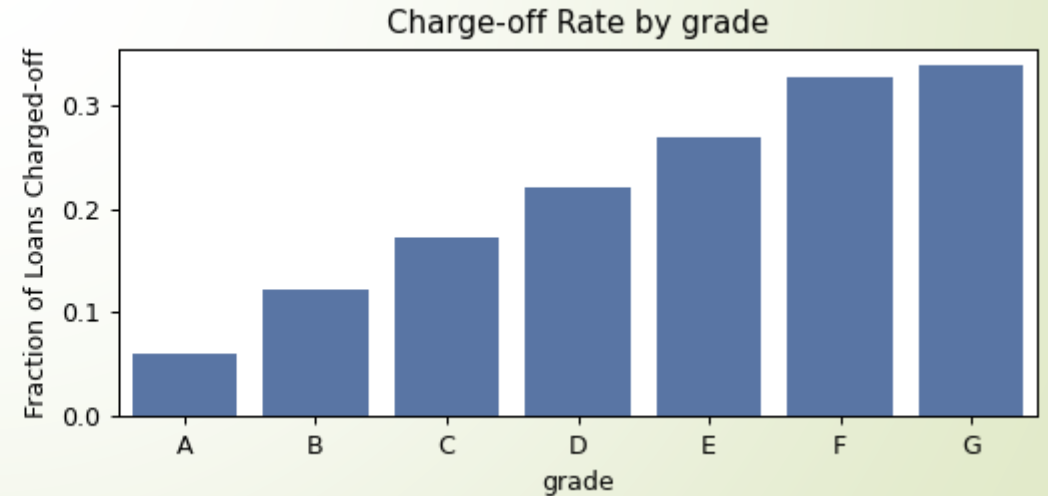
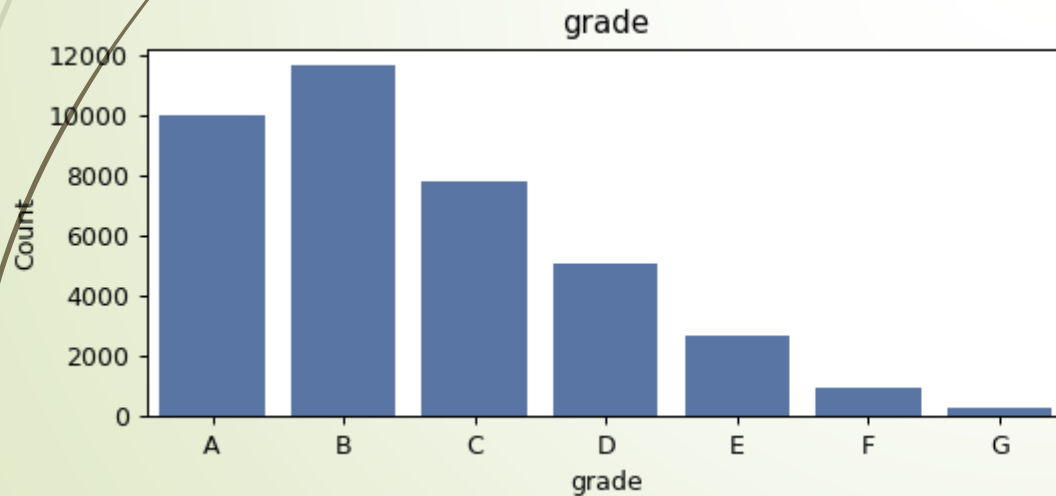
Analysis on Employment length

- The 10+ years of employment have the most number of loans.
- The Charged off Loan status does not appear to vary much with employment length on average.



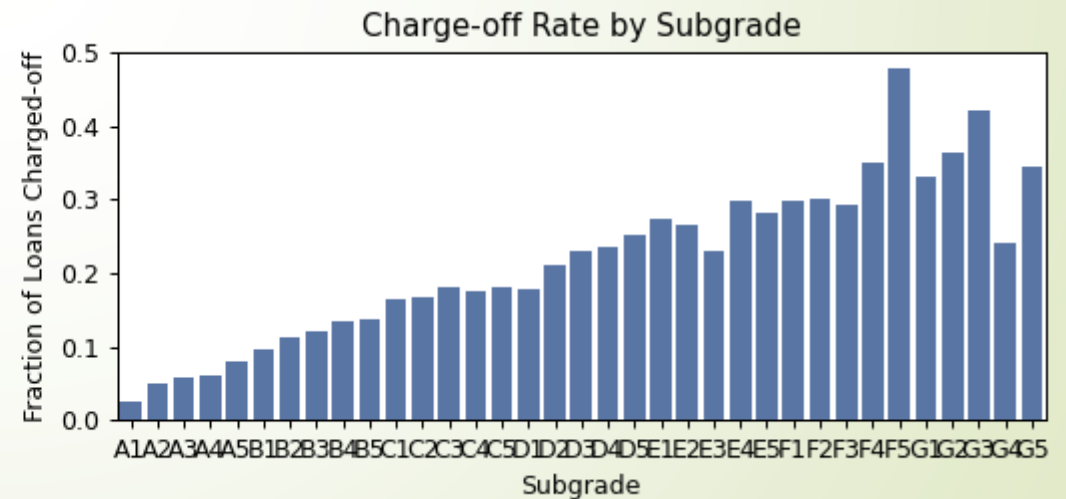
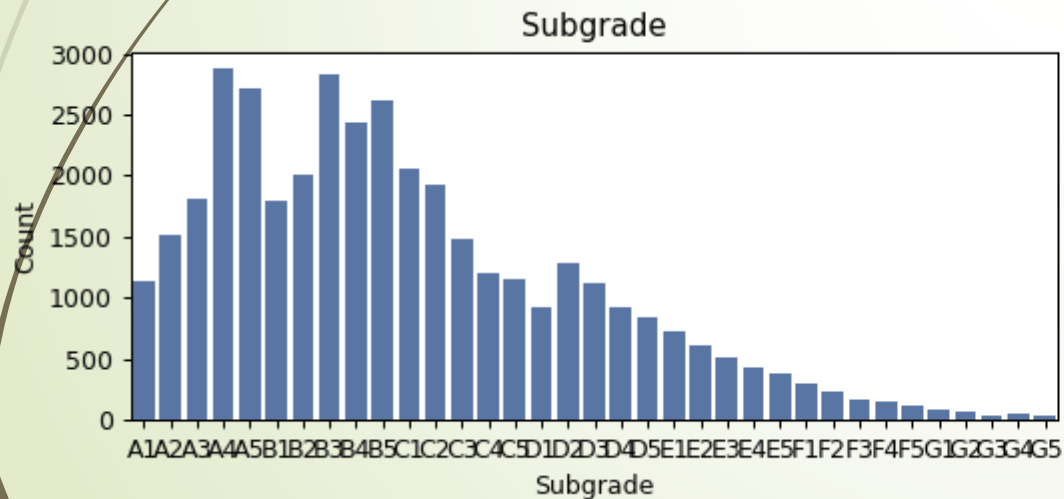
Analysis on Grade

- The grade (A,B,C) have more number of loans.
- The loan defaulted percent increase with Grade from A – G



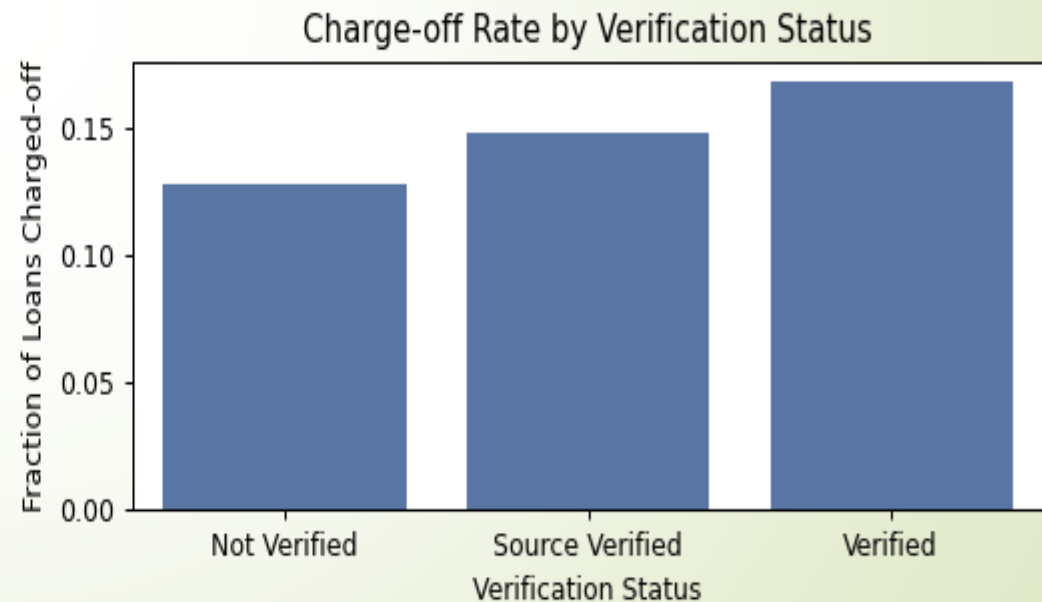
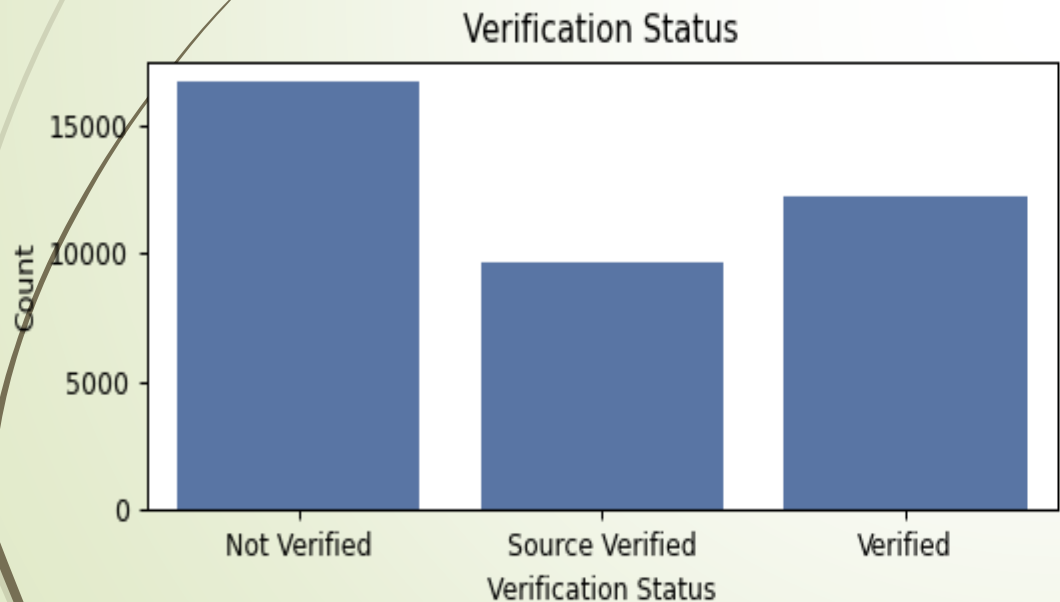
Analysis on Sub Grade

- There's a clear trend of higher probability of charge-off as the subgrade worsens.



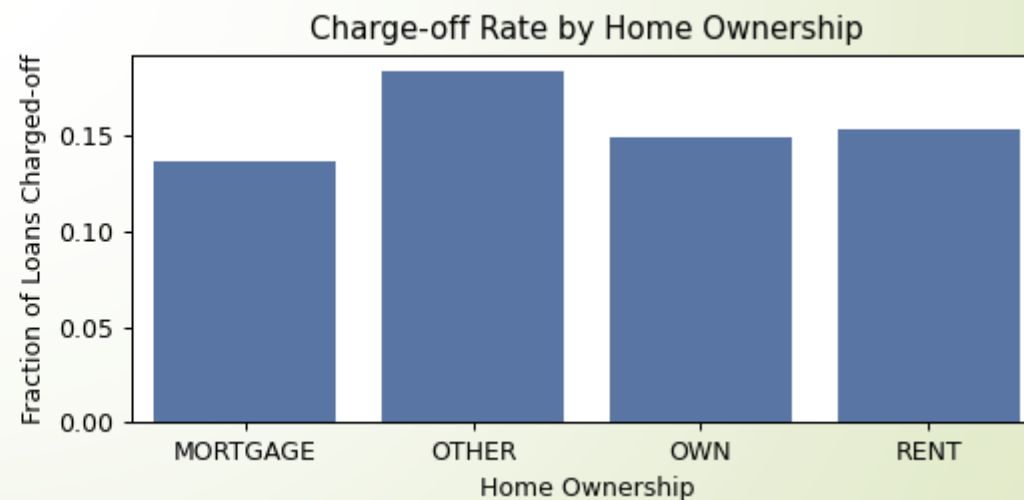
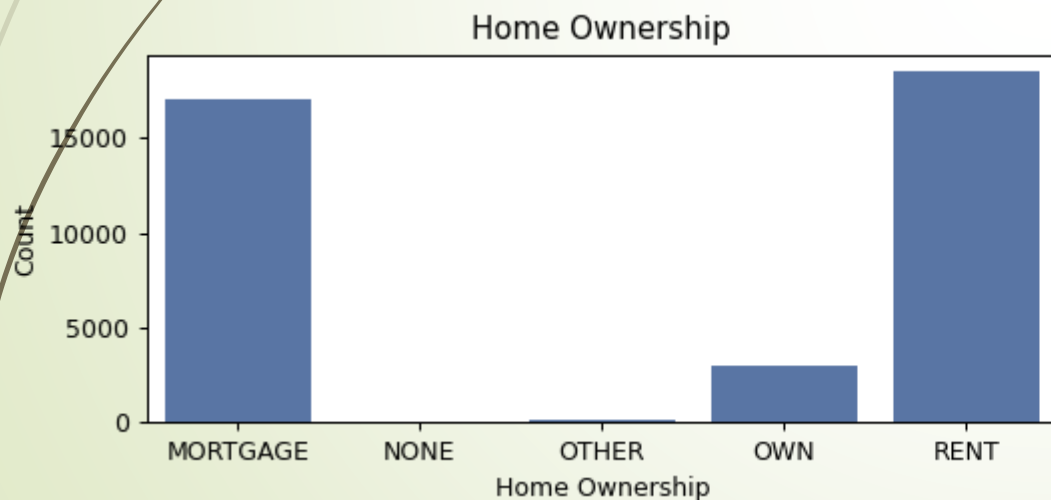
Analysis on Verification status

- The not verified borrowers have take more loans than verified and source verified. •
- The loan defaulted percent for verified borrower is higher than overall defaulted Loan Percent 11.63%.



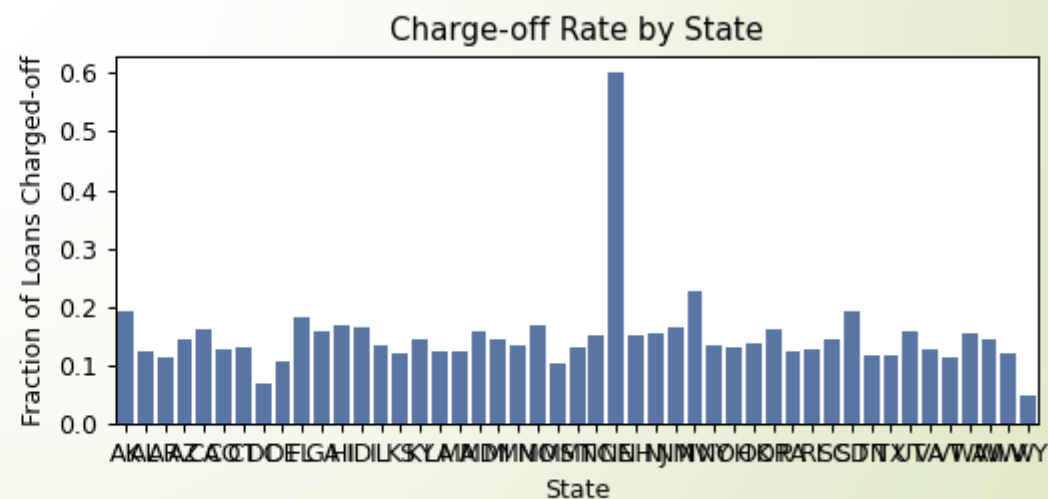
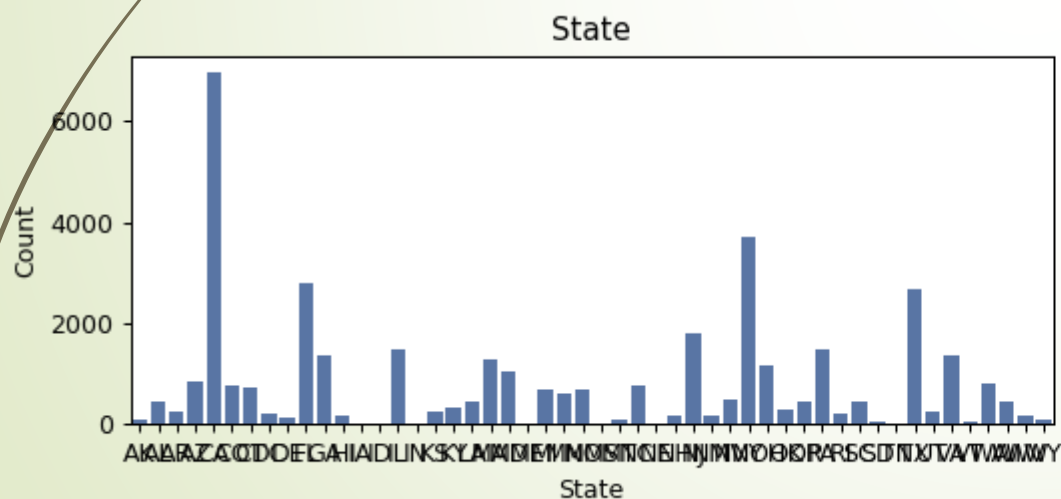
Analysis on Home Ownership

- Borrowers on rent and mortgage have most number of loans
- The loan defaulted percent remains constant for mortgage, own and rent



Analysis on Address State

- The charge-off rate ranges from 5.0% in Wyoming to 60% in Nebraska state.





Factor whether an applicant will be Defaulter

Continuous Variable:

1. LOAN_AMOUNT : Charged-off loans tend to have higher loan amounts when compared to fully paid.
2. INTEREST_RATE : As Interest rate increases the default rate increases steeply.
3. ANNUAL_INCOME : As the annual income increase the default rate decreases
4. DTI : As dti increase the default rate increases



Factor whether an applicant will be Defaulter

Categorical Variable:

1. TERM : 60 months term have a higher default rate than 36 months term
2. GRADE : As the Grade decreases (A B C D E F G) default rate increases
3. SUB_GRADE : As the Sub Grade decreases (A1 A2 B1 B2.....) default rate increases
4. VERIFICATION STATUS : Percent of loan defaulted is higher for verified borrowers
5. PURPOSE : Small business borrowers have high default rate
6. STATE : Percent of loan defaulted is very high for state Nebraska and high for NV and SD



Decisive Factor whether an applicant will be Defaulter:

1. INTEREST_RATE
2. ANNUAL_INCOME
3. DTI
4. TERM
5. GRADE
6. SUB_GRADE



Thank You