



Lending Club Case Study

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Objective

This case study aims to explore how Exploratory Data Analysis (EDA) can be used to identify patterns that predict loan defaults.

Develop a basic understanding of risk analytics in banking and financial services and understand how data is used to minimise the risk of losing money while lending to customers.



Business Understanding

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.



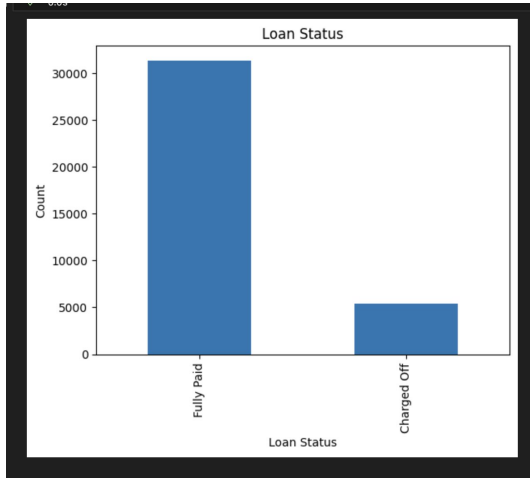
EDA Techniques Used

Data Cleaning: Handle missing values, remove duplicates, and correct inconsistencies.

Data Transformation: Convert categorical data into numerical format, normalize data.

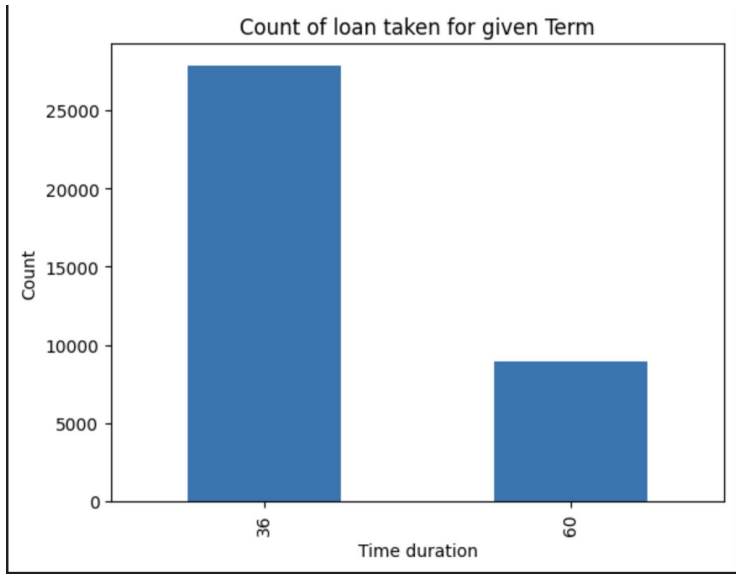
Visualization: Use histograms, box plots, and correlation heatmaps to understand relationships between variables.

Loan Status



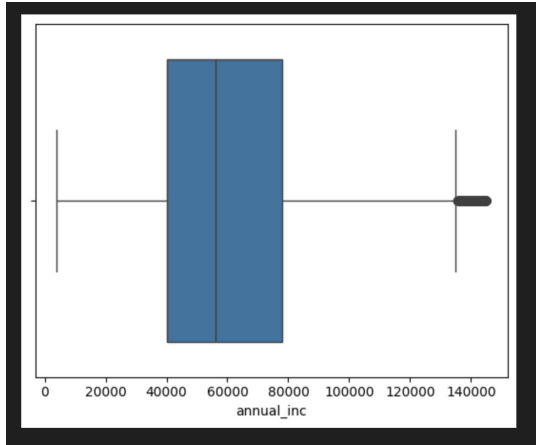
Number of loans with Defaulted state is less in number compared to fully paid.

Loan Term



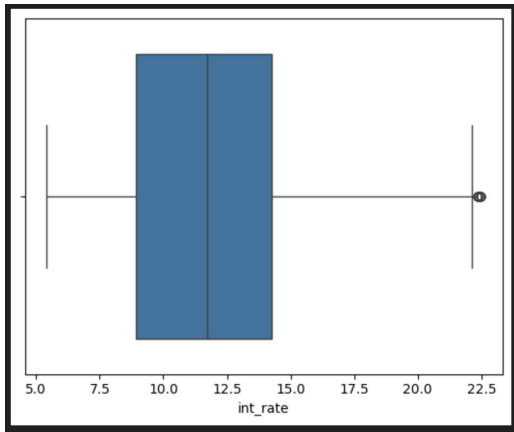
Number of Loans taken for 60 months is less compared to 36 months duration.

Loan Taking member based on annual income



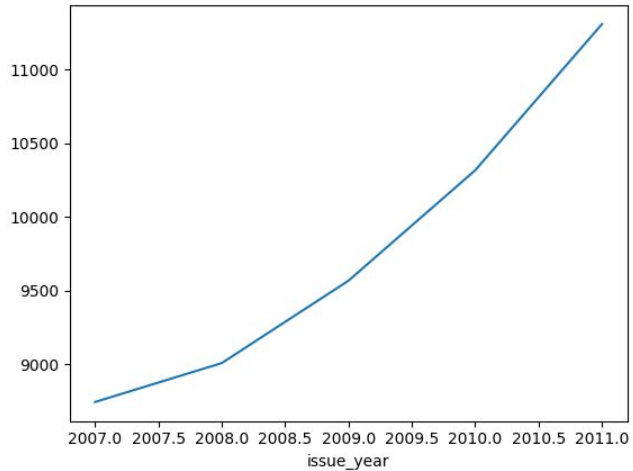
People with the annual income between 40000 to 80000 tends to take more loans.

Most Chosen interest Rate



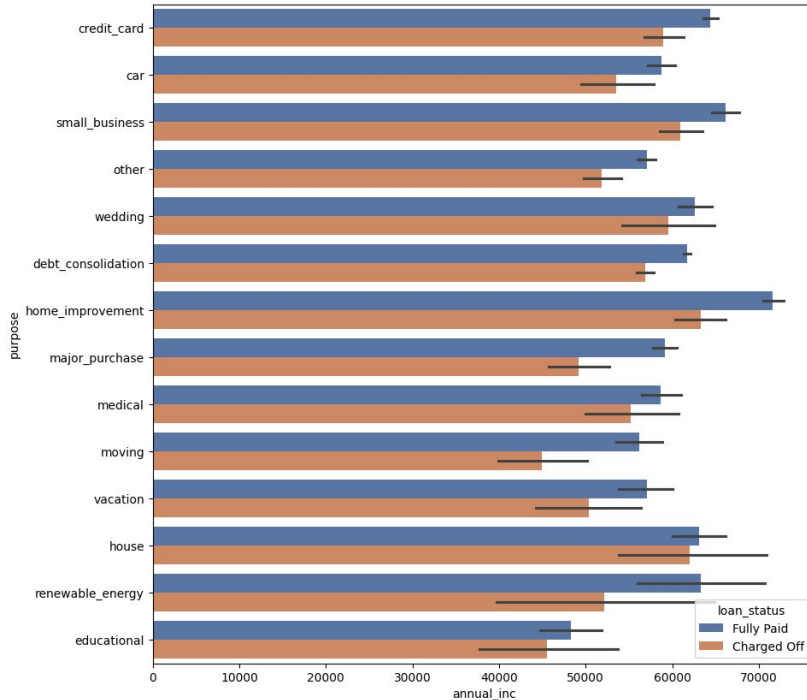
Loans with the interest rates between 8.94% to 14.27% are more attractive to people.

Loan amount increase by year



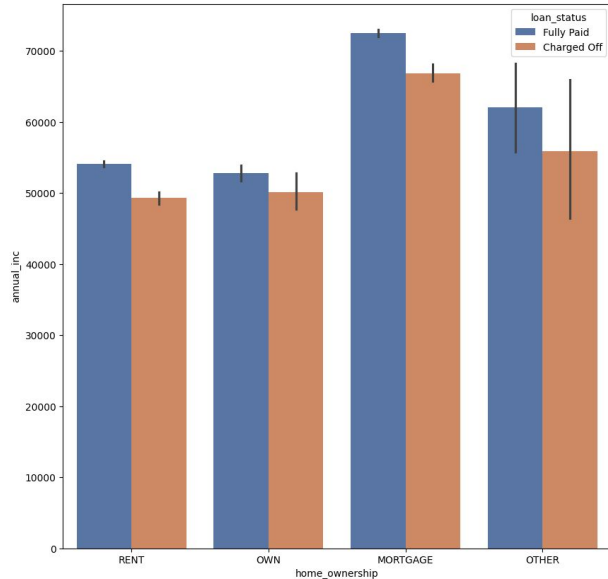
The overall Loan Amount given to the customers increases every year.

Purpose of Loan against annual Income



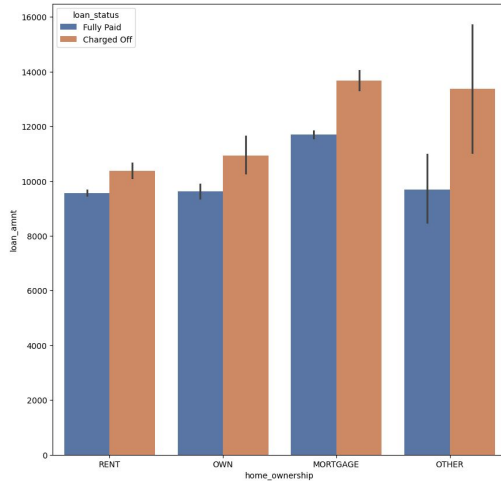
Number of Loan taken for home improvement is higher in correlation with the annual income.

Home Ownership against Annual Income



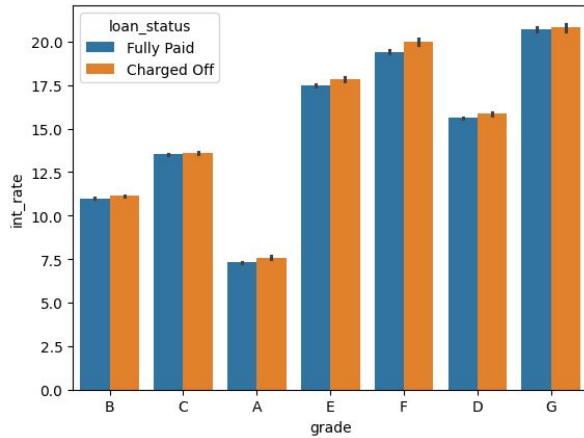
Loan Takers with home ownership Mortgage and higher salary is less likely to repay the Loans.

Home Ownership against Loan Amount



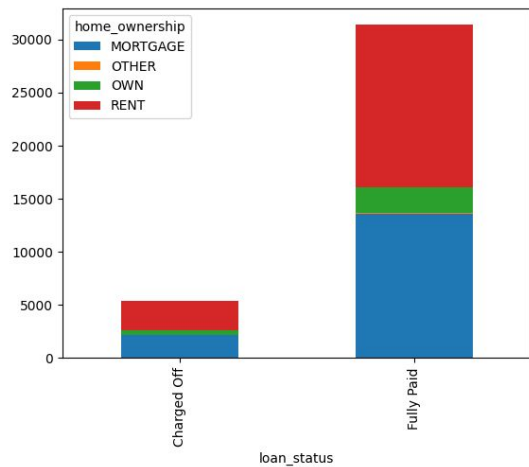
Loan Takers with home ownership Mortgage, taking the loan above 14k less like to repay the Loans.

Grade and Loan Status



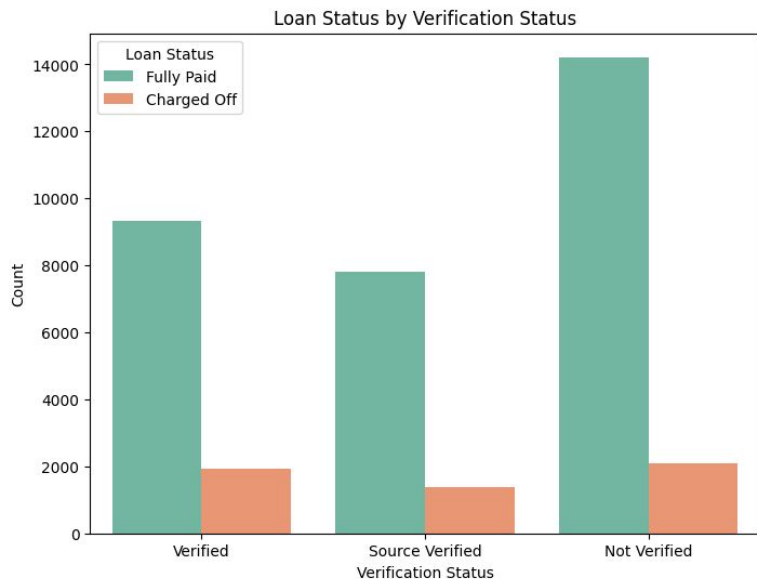
Loan Takers of Grades F and G taking the loan at higher interest rates are more number in defaulted.

Loan Takers Home ownership



Loan Takers who rent or have a mortgage are more likely to be defaulted.

Loan Status by Verification Status



Loans with verified members are also more likely to get defaulted as it is in Not Verified. This might be because of not having a solid verification process.



Overall Observations

- Number of loans with Defaulted state is less in number compared to fully paid.
- Number of Loans taken for 60 months is less compared to 36 months duration.
- People with the annual income between 40000 to 80000 tends to take more loans.
- Loans with the interest rates between 8.94% to 14.27% are more attractive to people.
- The overall Loan Amount given to the customers increases every year.
- Number of Loan taken for home improvement is higher in correlation with the annual income.
- Loan Takers with home ownership Mortgage and higher salary is less like to repay the Loans.
- Loan Takers with home ownership Mortgage, taking the loan above 14k less like to repay the Loans.
- Loan Takers of Grades F and G taking the loan at higher interest rates are more number in defaulted.
- Loan Takers who rent or have a mortgage are more likely to be defaulted.
- Loans with verified members are also more likely to get defaulted as it is in Not Verified. This might be because of not having a solid verification process.