Lending Club Case Study

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Objective

The objective of the Lending Club Case Study is to apply EDA on the real world problem.

This case study emphasis on analyzing and predicting the risk associated with personal loans. This EDA aims to identify patterns and create predictive models to enhance its decision-making process for loan approvals and risk management.

Steps taken to enhancing Loan Risk Prediction

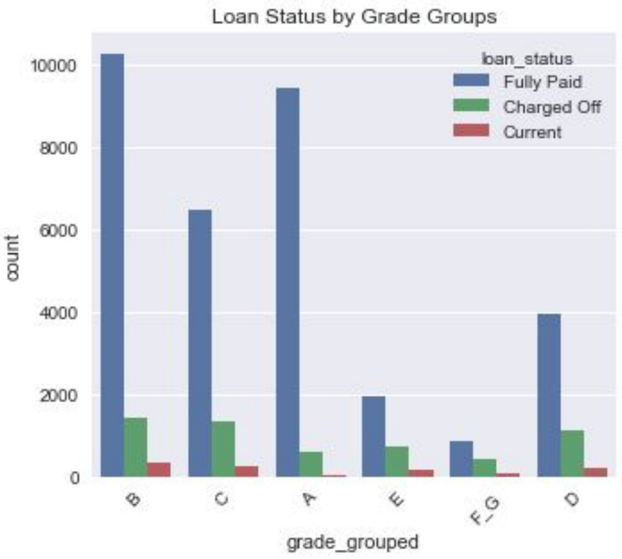
Dataset Details:

The data given below contains information about past loan applicants and whether they ‘defaulted’ or not. Data has details regarding approved loan not the rejected ones. It has 3 status of loan which is Fully Paid, Current and Charged-Off.

Data Analysis Process:

- **Data Cleanup:** Removing redundant columns (columns having all null values or same values or irrelevant columns), removing duplicates, filling null values with some text, median or mode as required.
- **Correcting Data Types:** Correcting Date data type or reducing multiple data types into a single one.
- **Managing Outliers:** Visualizing and analysing outliers
- **Graph and Relationship Visualization:** Plotting graphs and relationships between variables and making analysis on it as presented on further slides.

Loan Grade vs Grade Groups

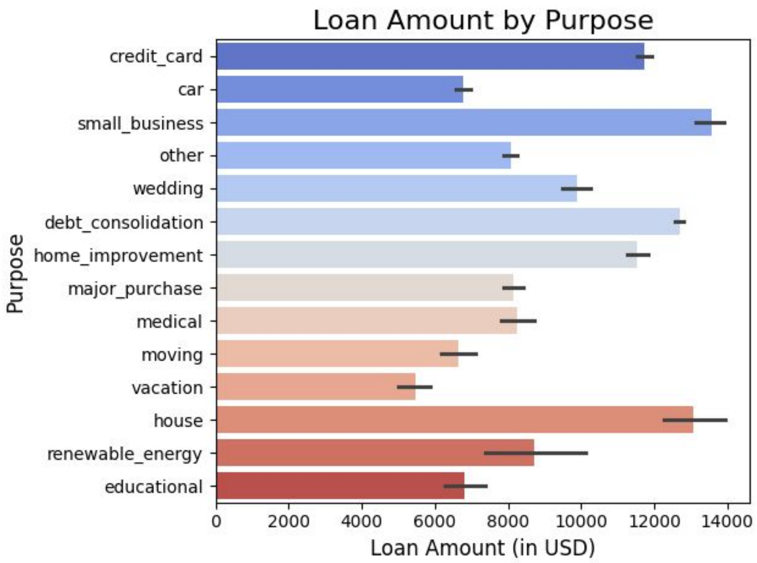


We can deduce that for **increasing grade groups (D, E, F & G)** higher percentage of people are getting their loans charged off compared to the lower grade levels (A, B & C).

Although **lower-grade loans (D, E, F & G) carry higher interest rates**, which might seem attractive to investors, the increased risk of default or charge-off often reduces the actual returns.

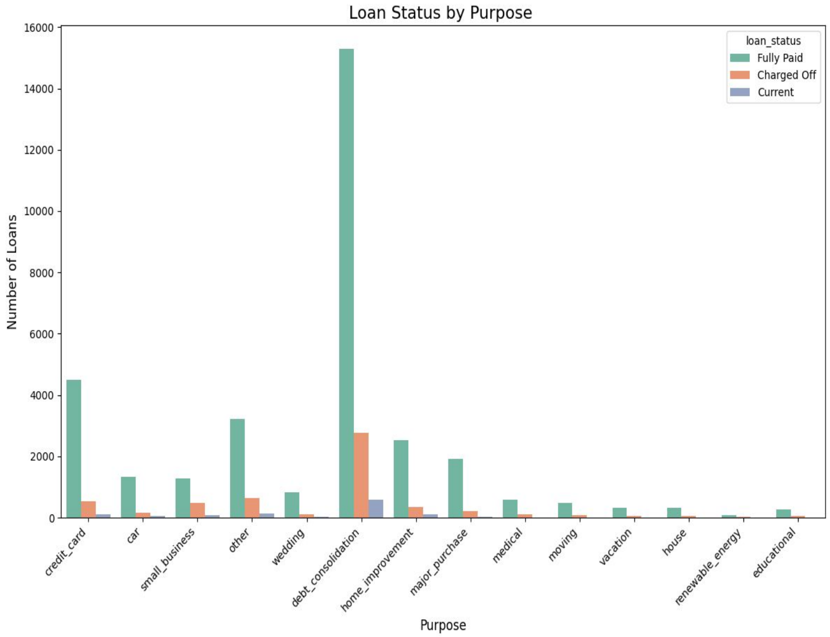
So, it will be profitable for the investors to emphasize more on higher grade loans (A, B & C), though interest rate is lower but majority pays the loan well.

Loan Amount vs Purpose



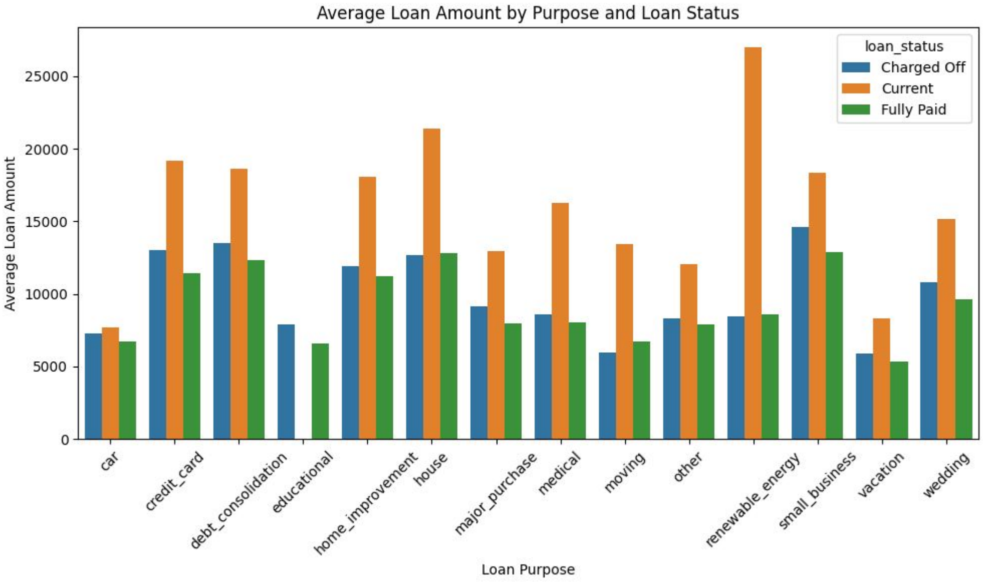
Loans are majorly getting taken for houses or small business followed by credit card and debt consolidation and rarely for vacation

Loan Status vs Purpose Groups



Debt consolidation loans tend to have more fully paid loans, while **Small business loans** might have higher charge-off rates

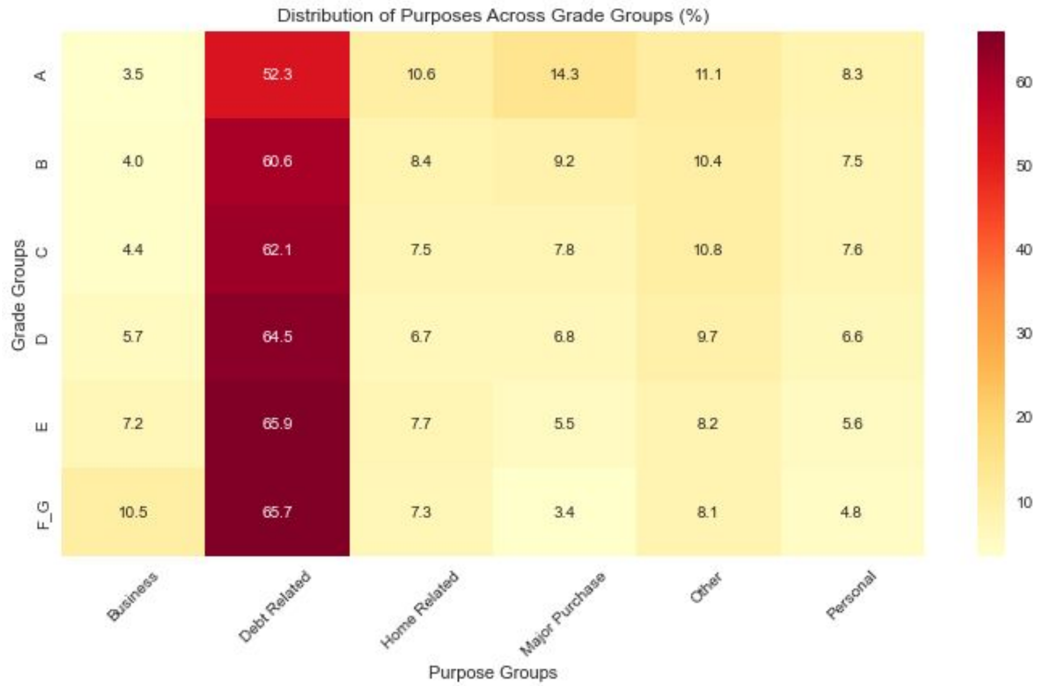
Average Loan Amount by Purpose and Loan Status



Loan Purpose: Loans for **debt consolidation** tend to be higher, while loans for **credit card** refinancing or card might be lower, all debt consolidation seeming to be charged off.
Loan Status: Fully paid loans tend to have higher average loan amounts compared to charged-off loans. This is consistent with the idea that borrowers with larger loans may have a better ability to repay.
Actionable Insights:

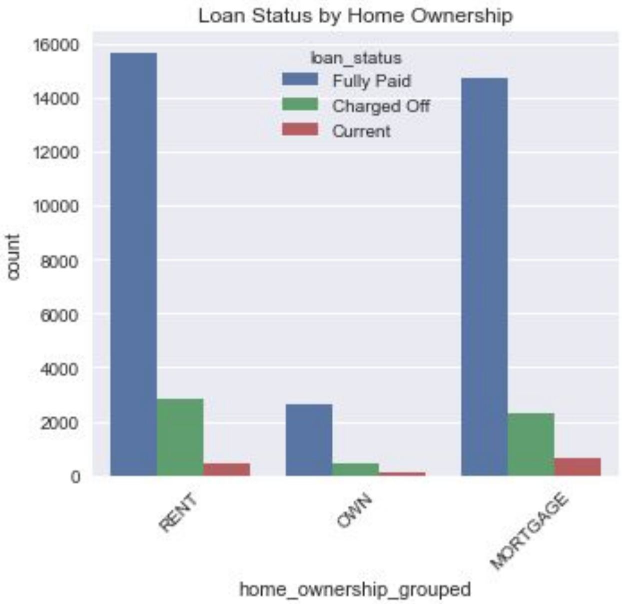
- Lending Club could target borrowers with high-value **Home Improvement** or **Debt Consolidation** loans, providing tailored financial products for these groups.
- Loans with a higher probability of being **charged off** could be managed more cautiously by offering smaller amounts or stricter credit checks.

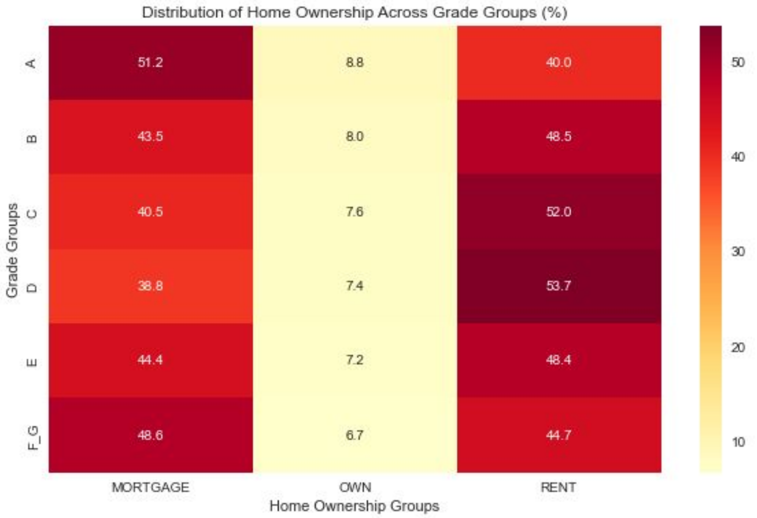
Purpose Groups across Grade Groups



Debt related purpose groups seems a lot more riskier and would offer more interest rates, and seemingly majority gets fully paid, making it more profitable.

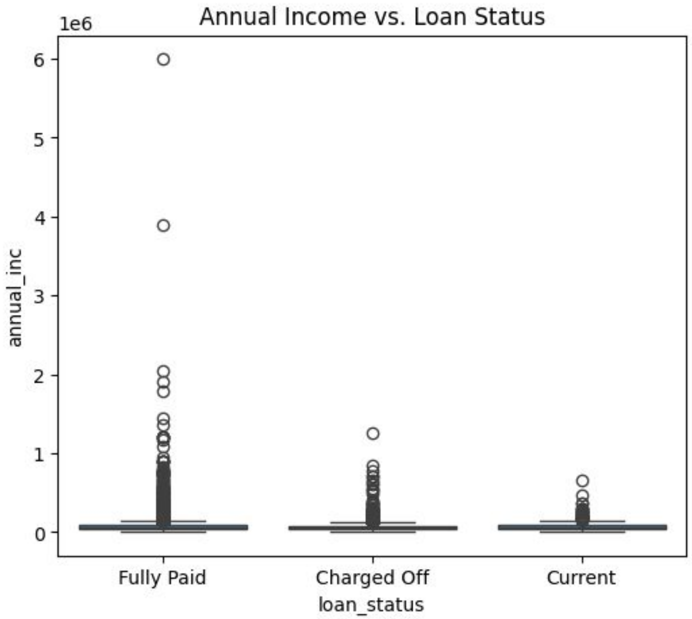
Loan Status vs Home Ownership





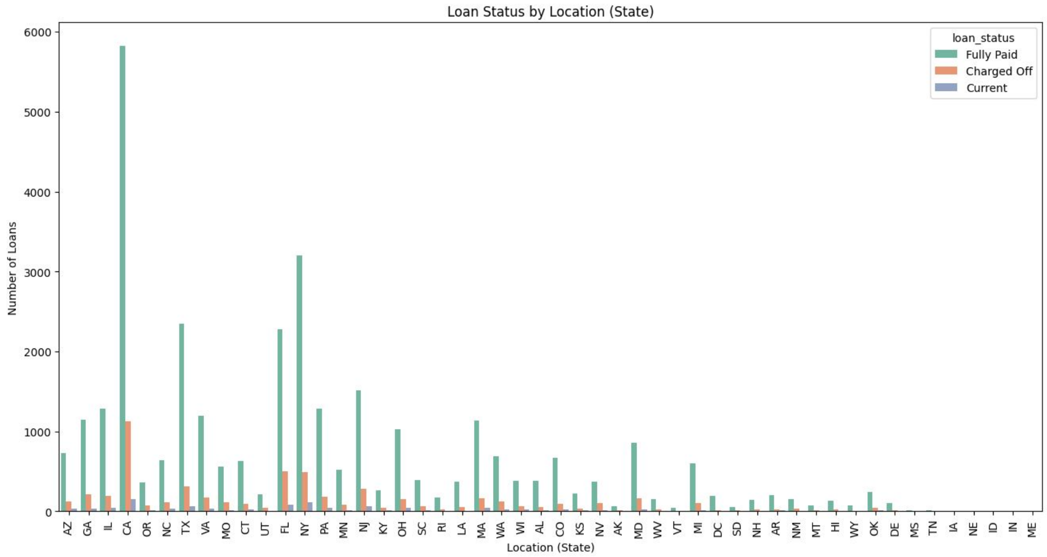
People with their own home are less likely to take loans and other loans are majorly paid back and mortgage and rent related loans are moderately risky.

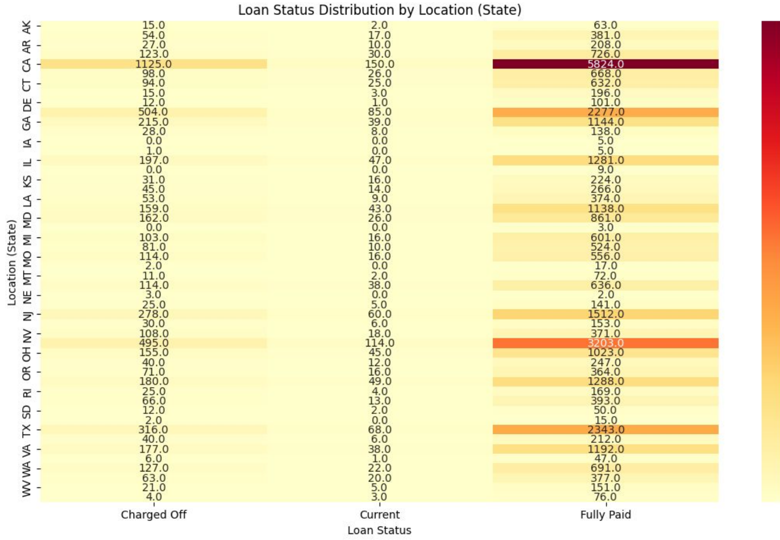
Annual Income vs Loan Status



Annual income is a key factor in determining the likelihood of loan repayment and loan status. High-income borrowers tend to have **higher repayment success rates** (fully paid loans), while low-income borrowers are at higher risk for **late payments** and **defaults** (charged-off loans).

Location vs Loan Status





California seems to have taken majority of loans as well as majority of charged off loans followed by DE

Recommendations

Major Line Ups for Charged Off Loans:

- Loans assigned lower grades (e.g., D, E, F, G) and subgrades are more likely to be charged off. These grades indicate higher credit risk, correlating with increased default rates.
- Borrowers with shorter employment histories are at a higher risk of loan charge-offs.
- Renters are more likely to have loans charged off compared to homeowners. Homeownership may reflect financial stability, reducing default risk.
- Loans taken for debt consolidation purposes have a higher likelihood of being charged off.