LENDING CLUB CASE STUDY

Submitted By:

- Rahul Singh
- Raja Kalavala

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Lending Club Case Study

Company Overview:

- Lending Club is the largest online marketplace which specializes in connecting lenders with borrowers through an online platform

Business Objective:

- To analyze loan application data to identify patterns indicating whether an applicant is likely to default.

Outcome:

- The outcome of this analysis will provide the company with a better understanding of the factors influencing loan defaults, enabling more accurate and profitable lending decisions.

Data Understanding

Types of Data:

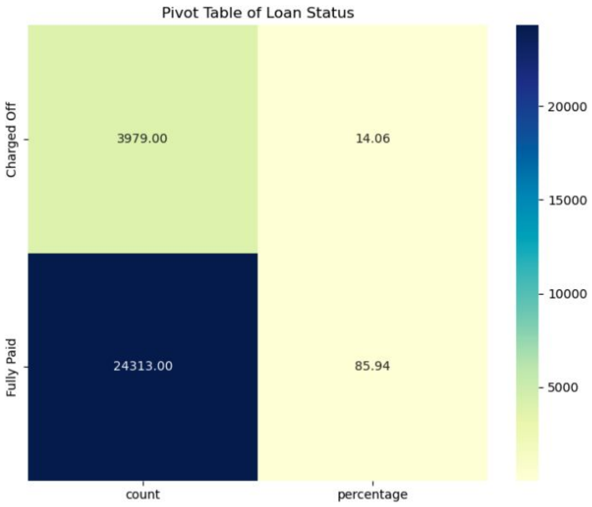
1. **Customer Data** (Employment title, annual income, zip code..)
2. **Loan Related Data** (Loan status, loan amount, funded amount..)
3. **Customer Behavioral Data** (loan purpose, recoveries, application type..)

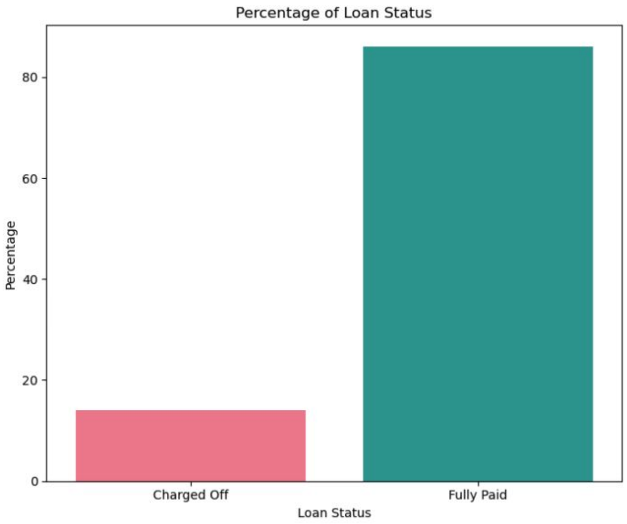
EDA Steps

1. **Data Handling and Cleaning:** Handle missing/singular values, correct data types, remove outliers and more.
2. **Sanity Checks**: Checking the correctness of the data
3. **Derived Metrics**: Create useful metrics for deeper analysis
4. **Visual Analysis:** Perform Univariate, Segmented Univariate, Bivariate and Multivariate Analysis to identify correlations and patterns.
5. **Insights:** Provide actionable insights based on the analysis to improve the loan approval process and mitigate financial risks.
6. **Business Recommendations:** Recommend Strategies based on Insights to the business to improve loan approval process.

Insight - Loan Status Distribution

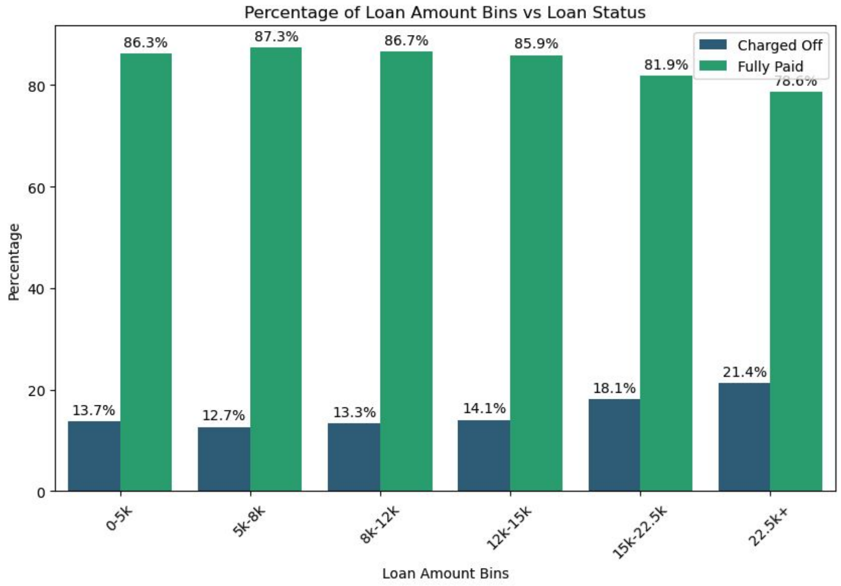
- Overall, 86% of consumers have fully paid their loans, while 14% of consumers have defaulted.





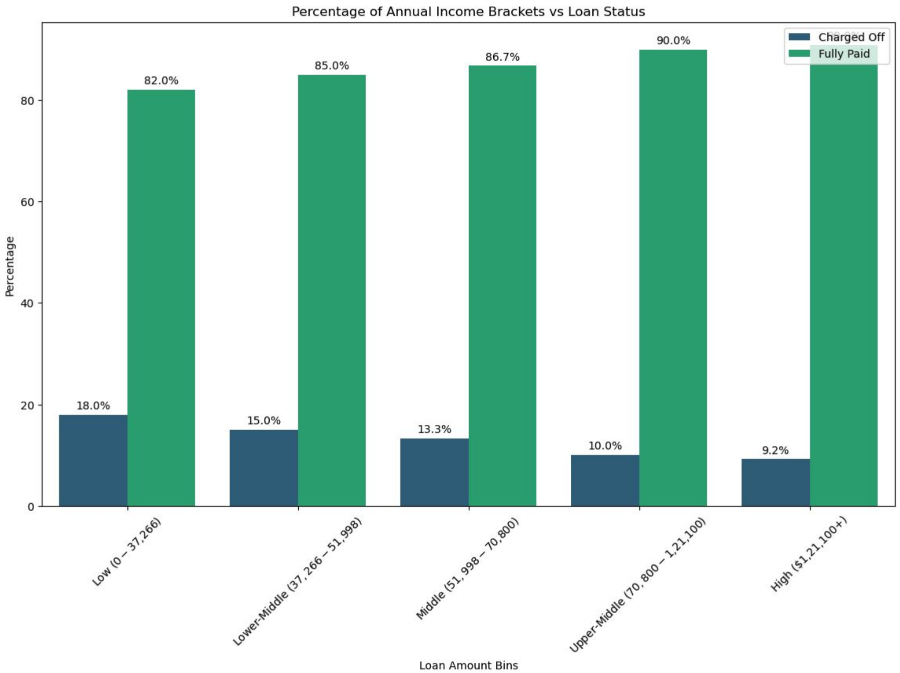
Insight - Loan Amount And Default Risk

- Higher loan amounts (above $15K) correlate with a greater risk of default.



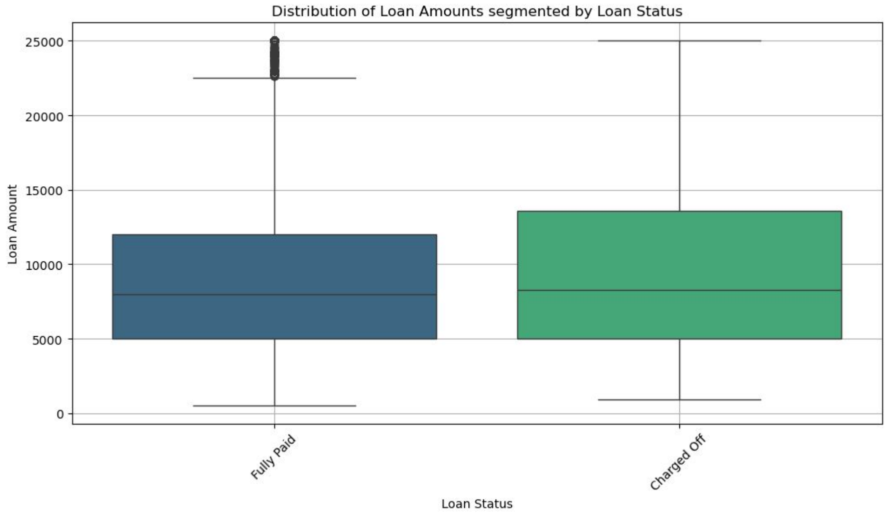
Insights - Income And Default Risk

- Higher income groups are associated with a higher likelihood of fully paying their loans.
- Borrowers with **lower annual incomes are associated with a higher chance of defaulting on loans.**



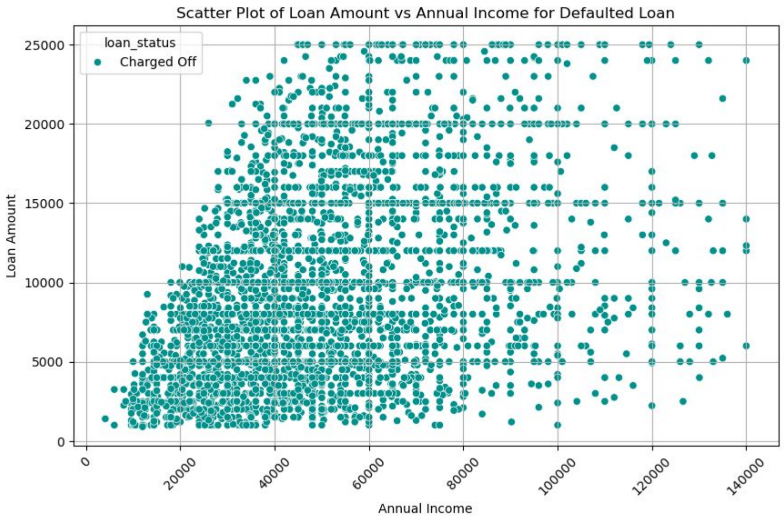
Insight - Loan To Income Ratio

- Median, 25th and 75th percentile of charged-off loans is higher than that of fully paid loans.
- **Higher loan amounts relative to income (loan-to-income ratio) are associated with higher default risk.**



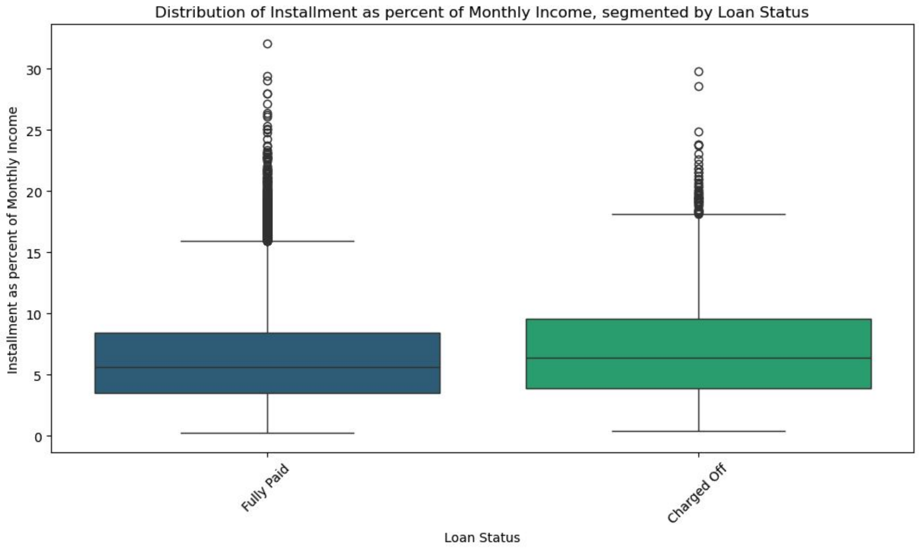
Insight - Loan Amount Vs Annual Income

- Charged off loans are across various loan amounts, but there is a notable density in the $5,000 to $15,000 range.
- There seems to be a decrease in density at the higher income levels (above $80,000). This suggests that **higher income borrowers may have a lower risk of default.**



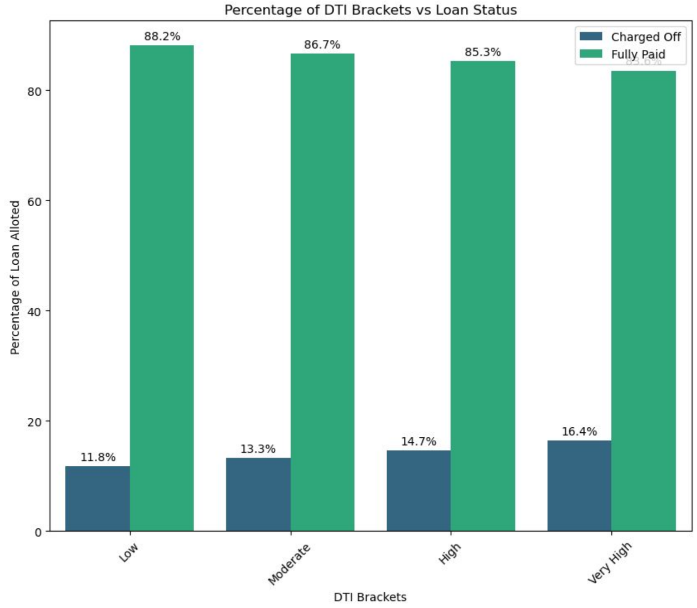
Insights - Installment Amount And Default Risk

- Median, 25th and 75th percentile of charged-off loans is higher than that of fully paid loans.
- This means **Higher installment amount as a percent of consumer's monthly income are more likely to default.**



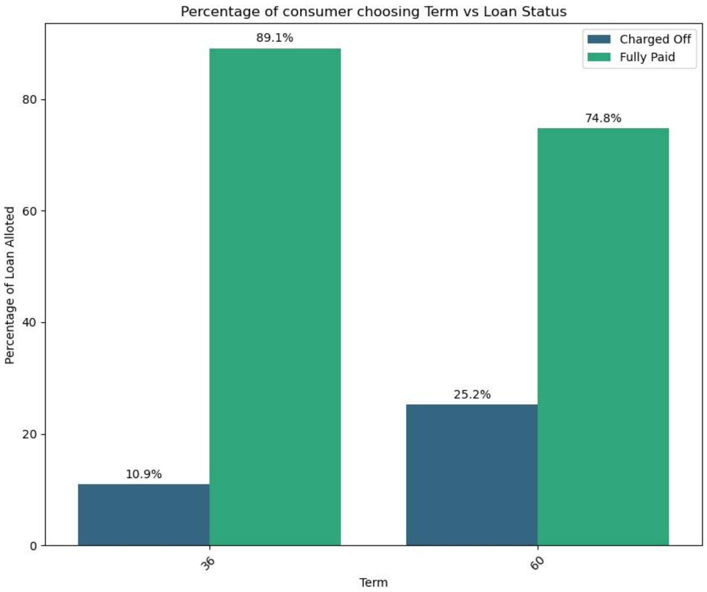
Insight - Debt-to-Income (DTI) Ratio

- Higher DTI ratios are correlated with higher default rates.
- Lower DTI ratios are associated with a higher likelihood of fully paying the loan.



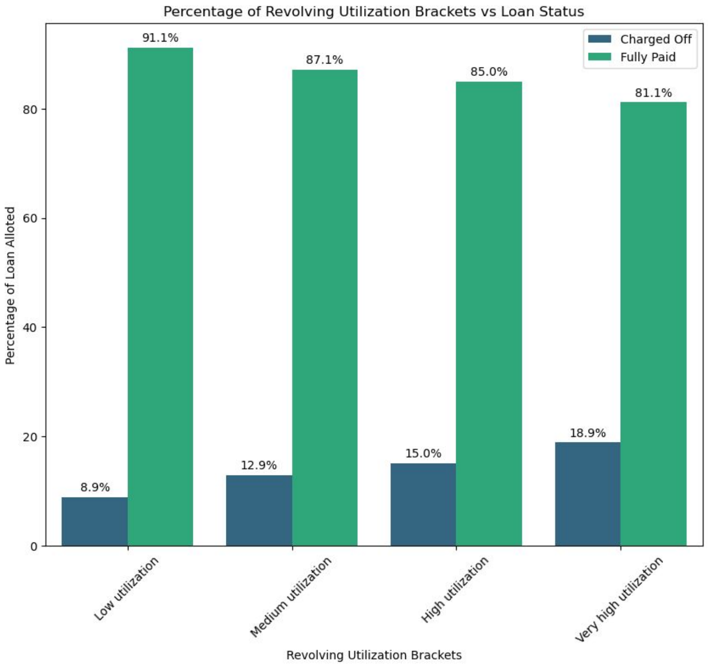
Insight - Loan Term And Default Risk

- There is direct relationship between Charged Off Loan and Term.
- Loans with shorter loan terms have a lower chance of being charged off, while **Longer loan terms are associated with higher default rates.**



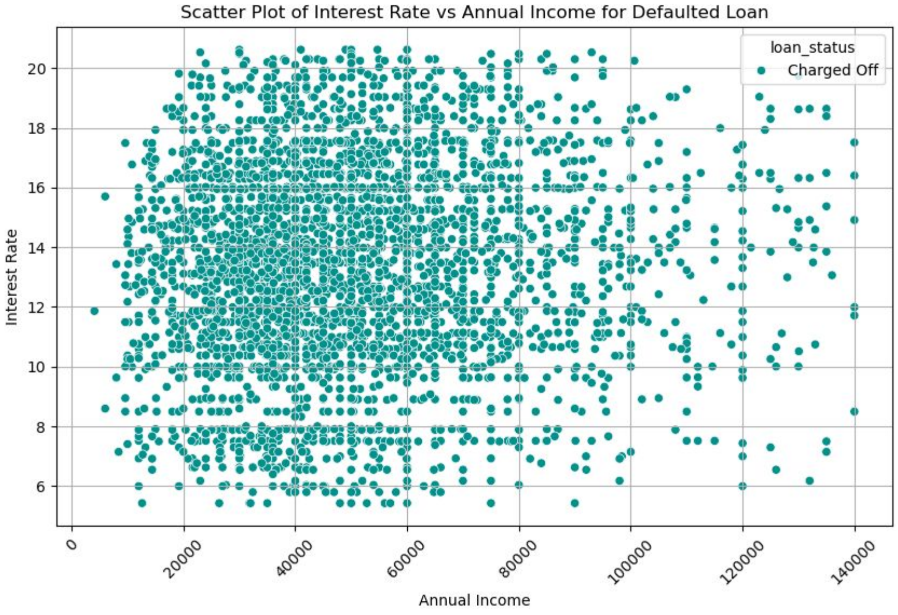
Insight - Revolving Utilization And Default Risk

- There is direct relationship between Charged Off Loan and Revolving Utilization.
- **Higher revolving utilization** (credit card balances relative to credit limits) is associated with **higher default risk.**



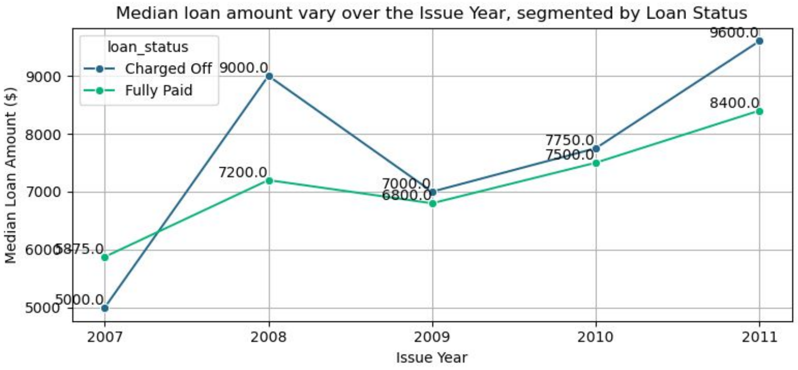
Insight - Interest Rate

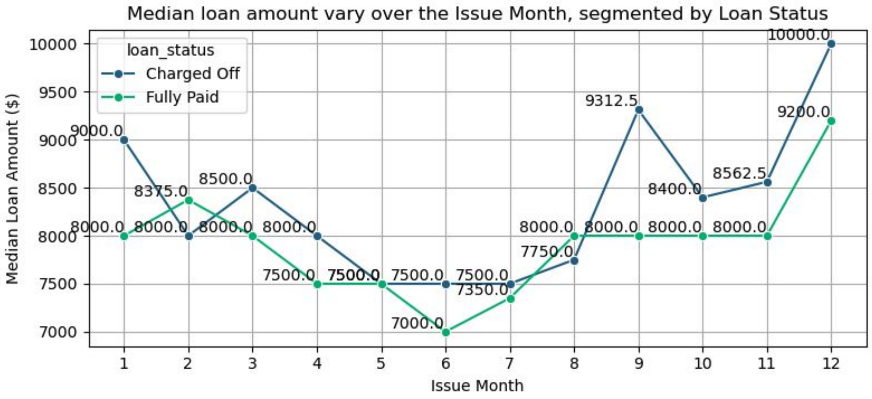
- We can see the concentration of charged off loans are higher for annual income above $8K and interest rate above 10%.
- **Higher interest rates (above 10%) are linked to higher default rates.**

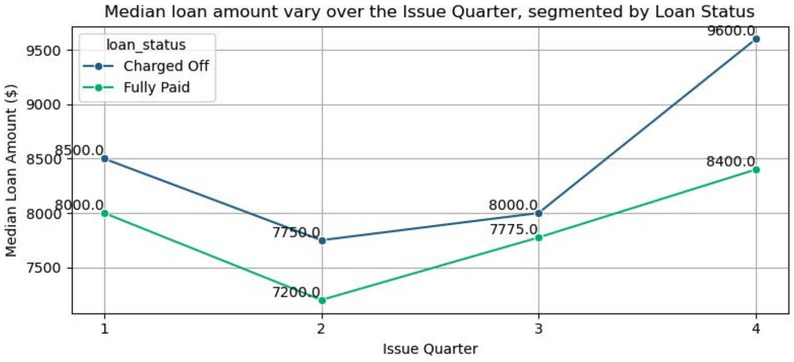


Insight - Loan Issue Date

- Loans issued during the **2008 recession had higher default rates.**
- Last quarter of each year and specially month of December are linked to higher default rates.

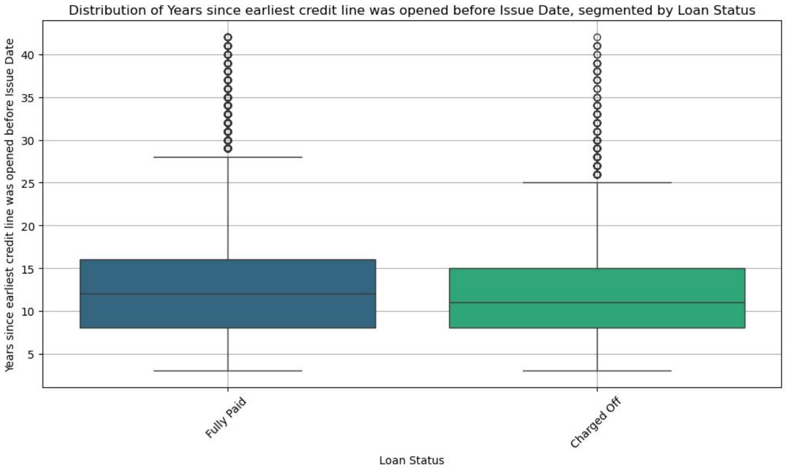


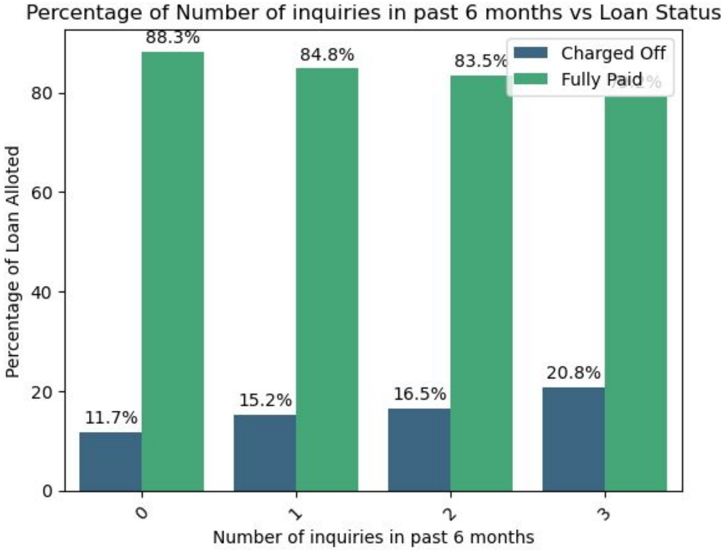




Insight - Credit History And Default Risk

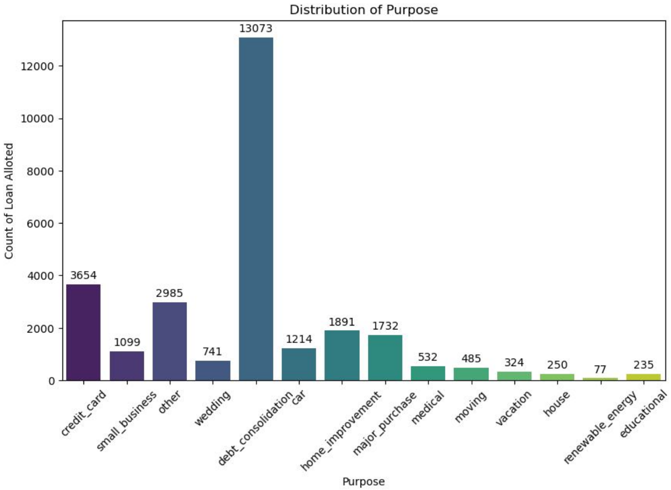
- Longer credit histories are associated with a higher likelihood of fully paying loans.
- Borrowers with more inquiries in the last 6 months are associated with a higher chance of defaulting.

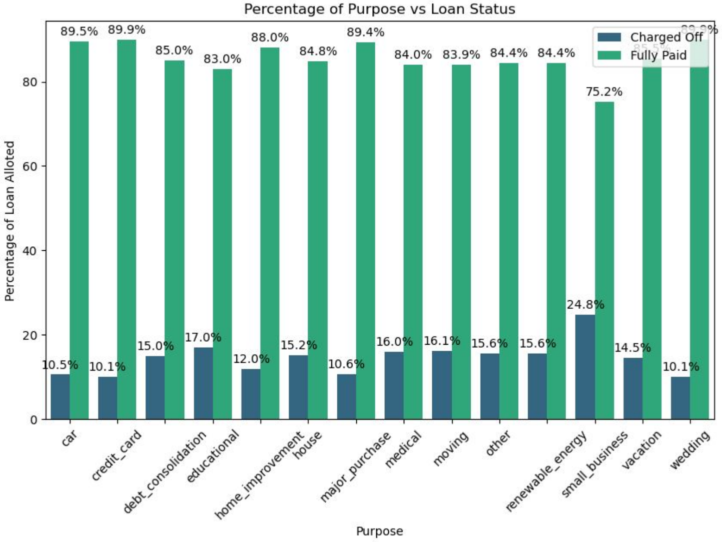




Insight - Loan Purpose And Default Risk

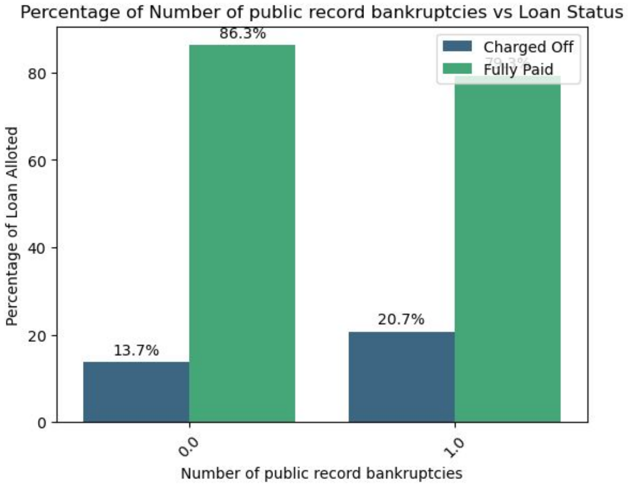
- Loans for **Debt Consolidation** and **Renewable Energy** are associated with higher default rates.
- Majority of loan has purpose as Debt Consolidation. So, this loan request should have stricter approval criteria.

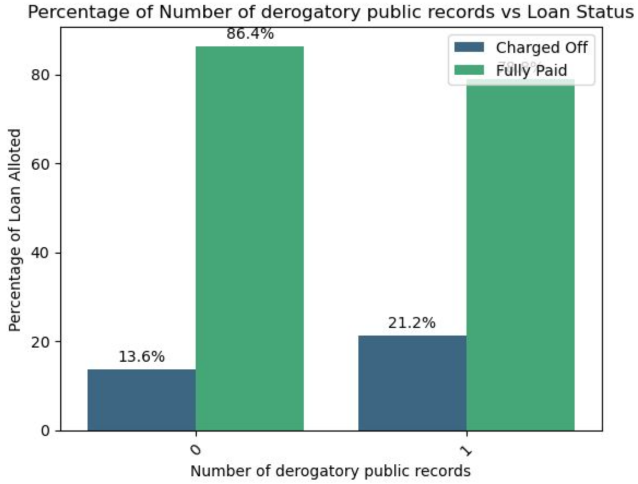




Insight - Public Records

- Consumers with no public records have better repayment history.





Recommendations To Business

- Consider capping loan amounts for borrowers with lower incomes to reduce the risk of default.
- Set higher interest rates or stricter approval criteria for high risk borrowers (e.g., those with high revolving utilization and low incomes)
- Focus marketing efforts on low-risk borrower segments (high income, low DTI, good credit history).
- Develop more robust credit scoring models that account for employment length, credit history length, and loan purpose.
- Be cautious with loans for high-risk purposes (e.g., debt consolidation, renewable energy) and implement additional checks.

Thank You