Lending Club Case Study

Group Members
1) Sandeep Gaikwad
2) Ramu Pallepati

Background:

The company is the largest online loan marketplace, offering personal, business, and medical loans through a fast online interface. A major challenge is **credit loss**, which occurs when borrowers default on their loans, causing financial losses. Identifying high-risk borrowers (those labeled as “charged-off”) is crucial to minimizing these losses.

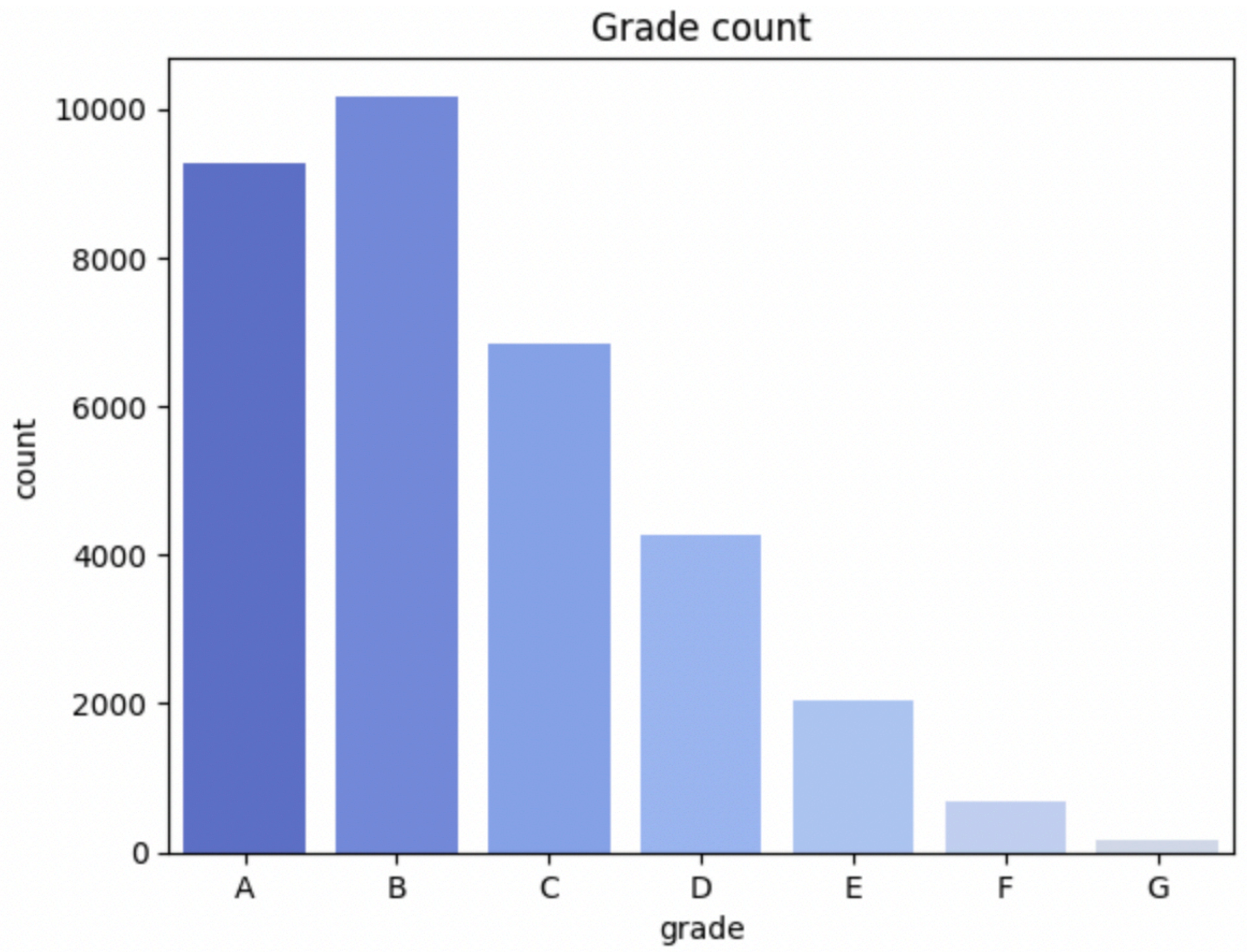
Objective:

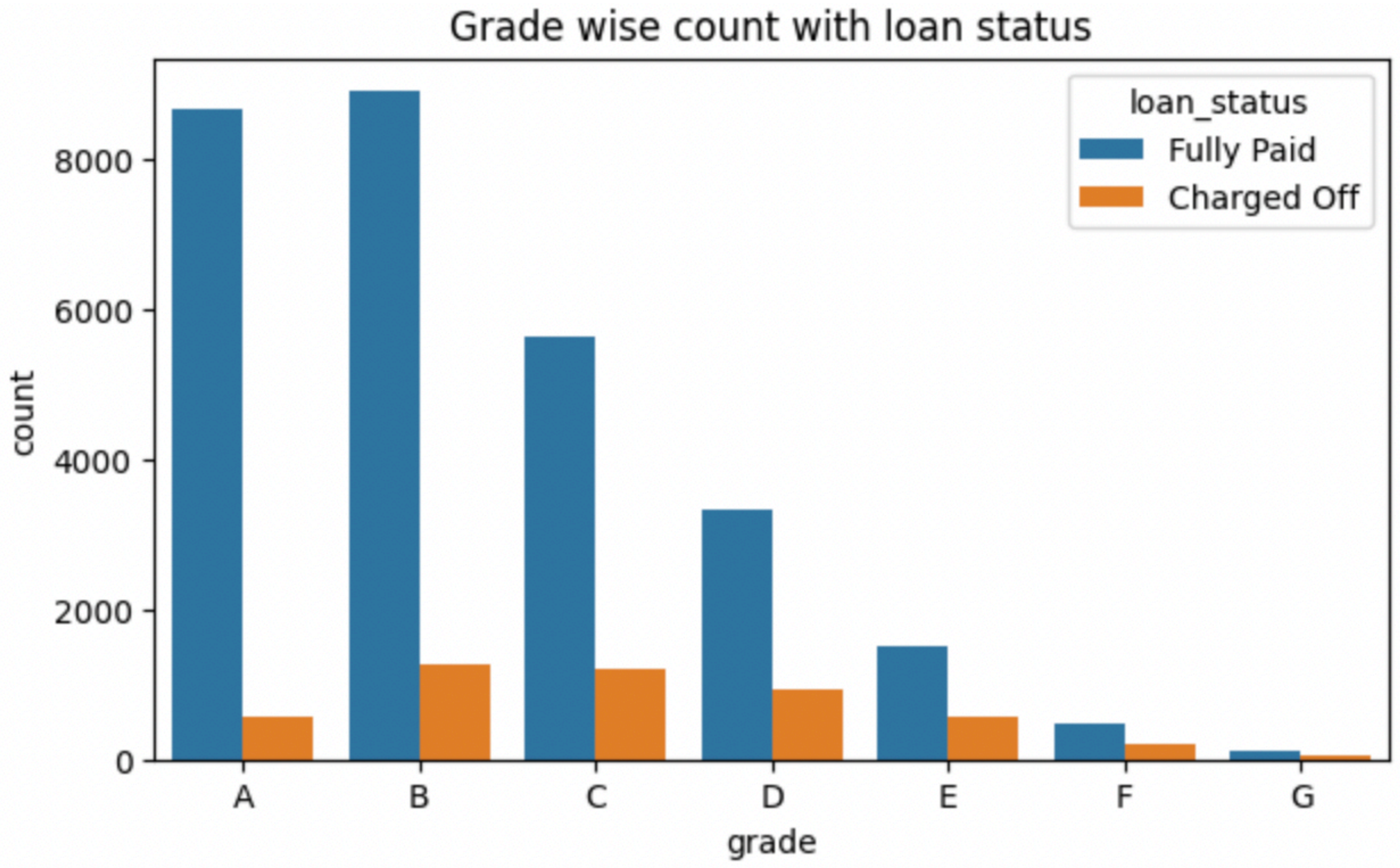
The goal of this case study is to identify the **key factors** that lead to loan defaults. By understanding which variables are strong indicators of default, the company can refine its **risk assessment** and **portfolio management**, reducing credit losses and improving loan quality.

Approach

1. **Data Understanding**: Review the data dictionary to grasp each column’s purpose and domain use.
2. **Data Cleaning**: Remove unnecessary columns, handle missing values, and outliers.
3. **Data Manipulation**: Typecast data and create derived columns for better insights.
4. **Univariate Analysis**: Analyze and plot the distribution of each column.
5. **Segmented Univariate Analysis**: Analyze categorical columns for segmented insights.
6. **Bivariate Analysis**: Study relationships between two columns, focusing on charge-off proportions.
7. **Recommendations**: Provide key insights and recommendations to reduce loan default risks.

Grade Wise Count

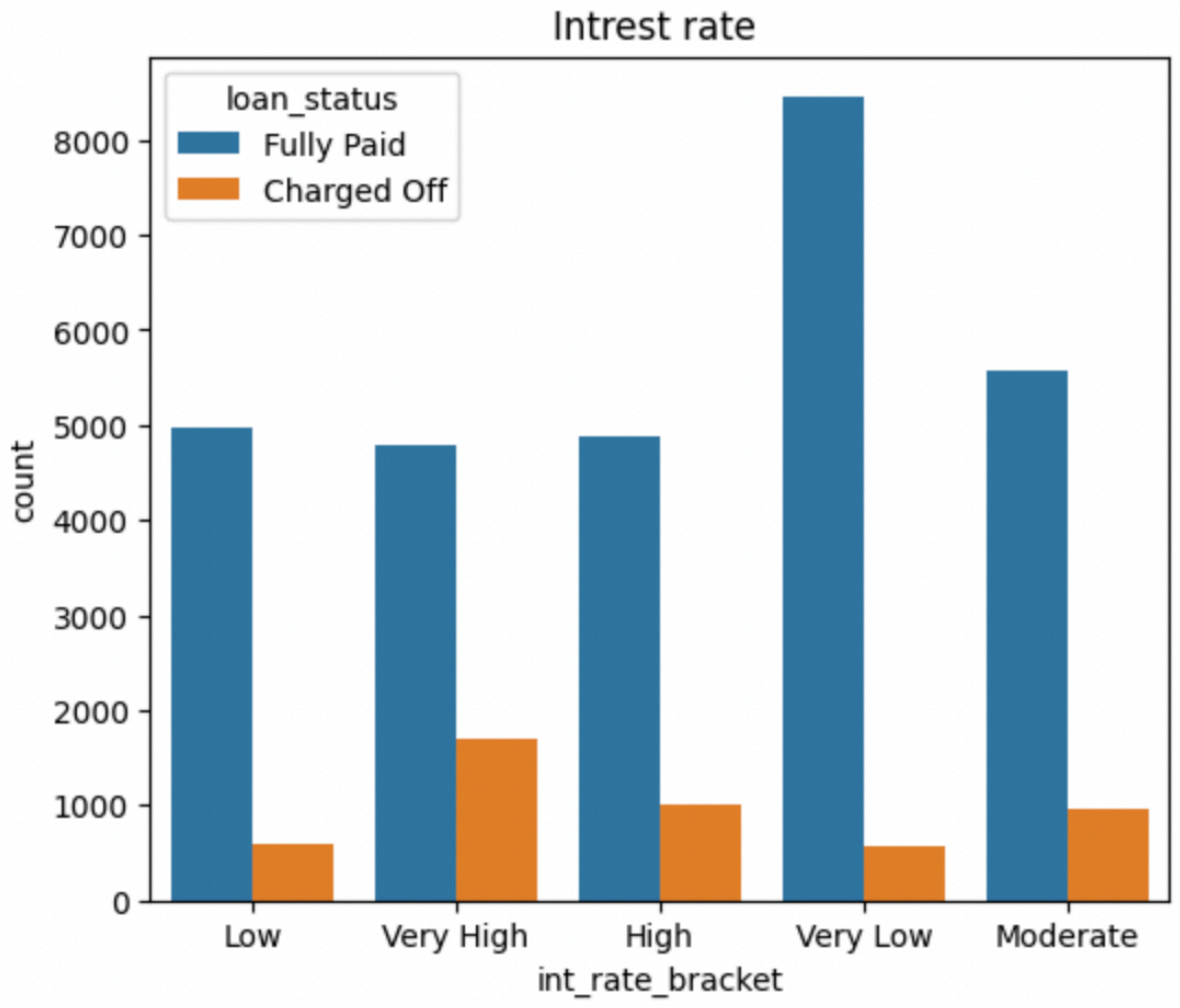




- Borrowers with Grades A, B, and C have applied for more loans compared to those in other grade categories.
- Additionally, Grades A, B, and C have a higher rate of fully repaid loans, with fewer defaults observed compared to other grade levels.

Count Vs Interest rates bracket

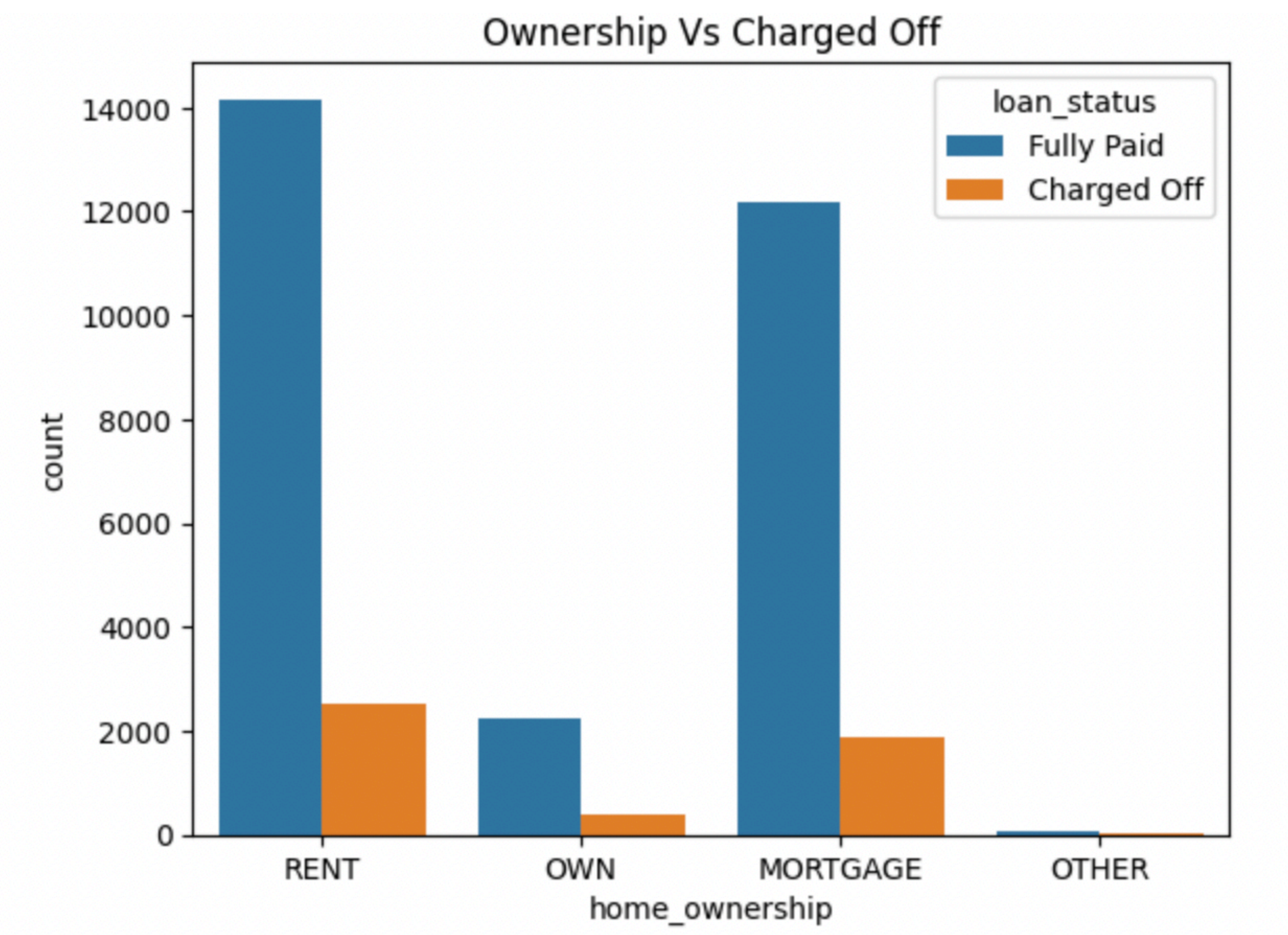
- Loans with elevated interest rates have a higher likelihood of being charged off.
- The maximum interest rate reaches 24%, with most rates ranging from 9% to 14%.
- Offering loans at lower interest rates can reduce the number of defaulters.



When the loan interest rate is high there is high chance of loan getting defaulted.

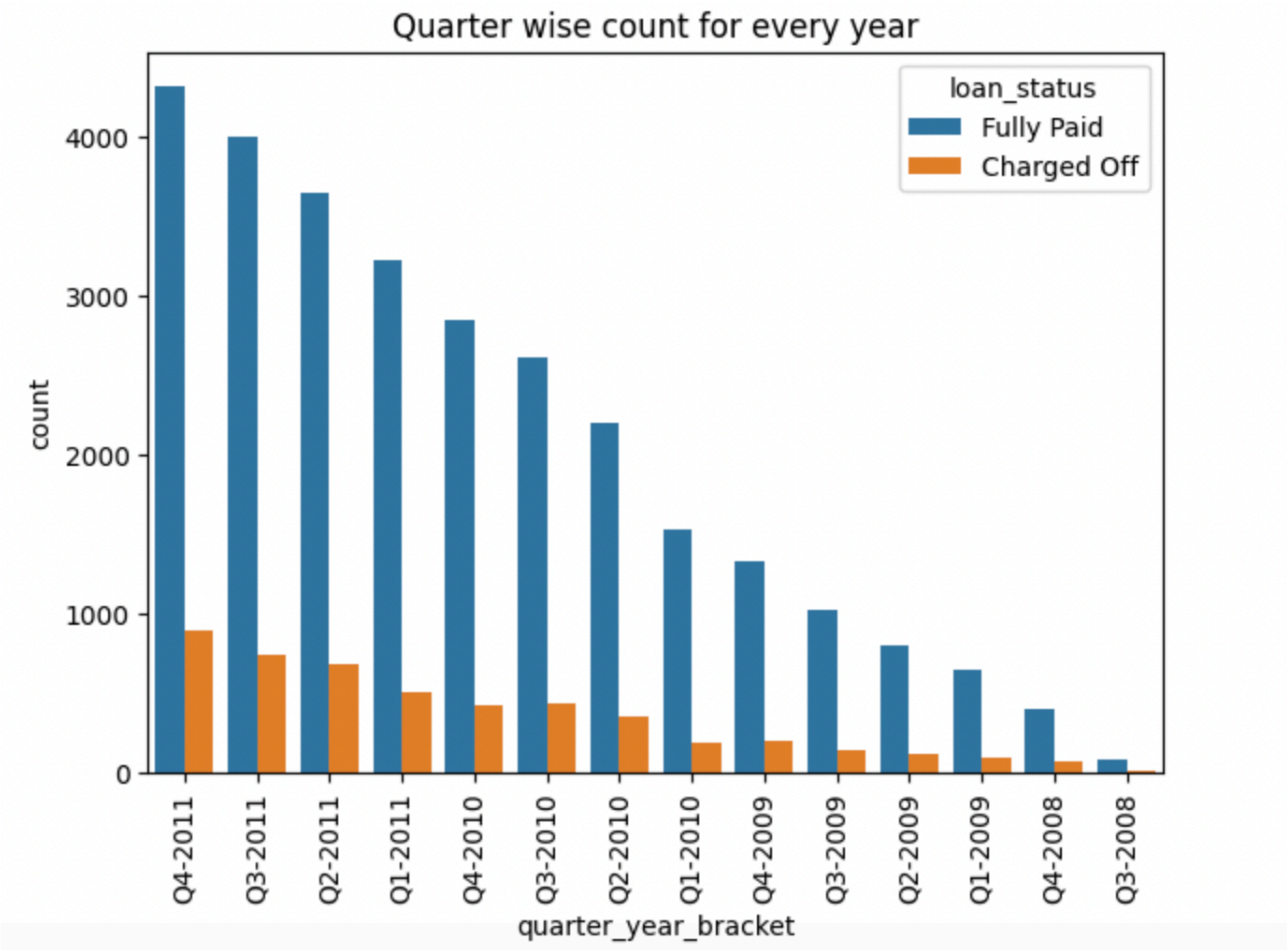
Home Ownership vs Charged Off

- The majority of borrowers either rent or have mortgages for their homes.
- The number of renters who have fully repaid their loans has reached around 14,000.



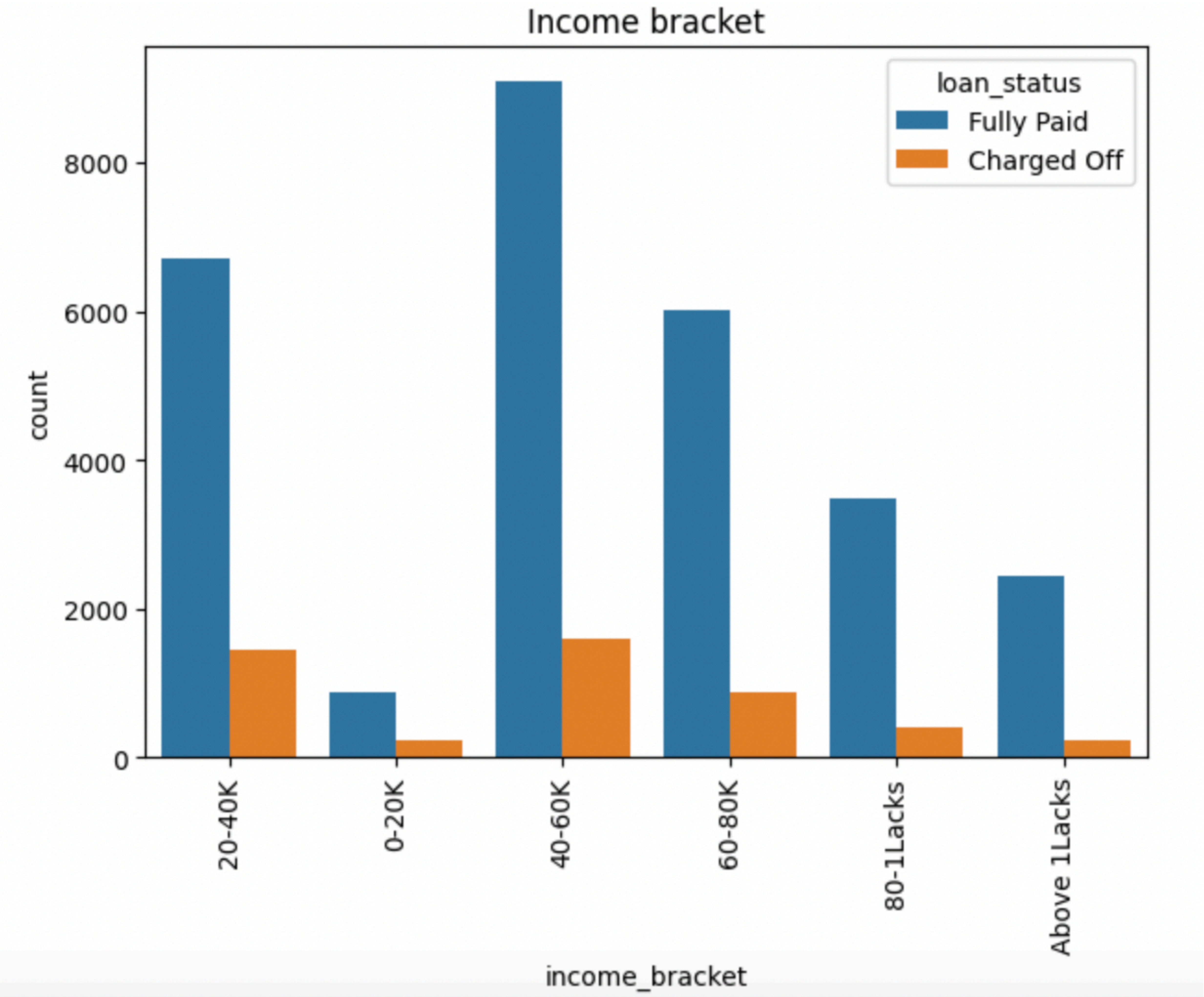
Quarter wise count

- The number of borrowers fully repaying their loans has been steadily rising each year across all quarters.
- In Q3 of 2008, the count was around 100, but by the last quarter of 2011 (Q4), it had grown to 5,200 as more individuals took out loans.
- Over a span of three years, the borrower population increased by 52%.



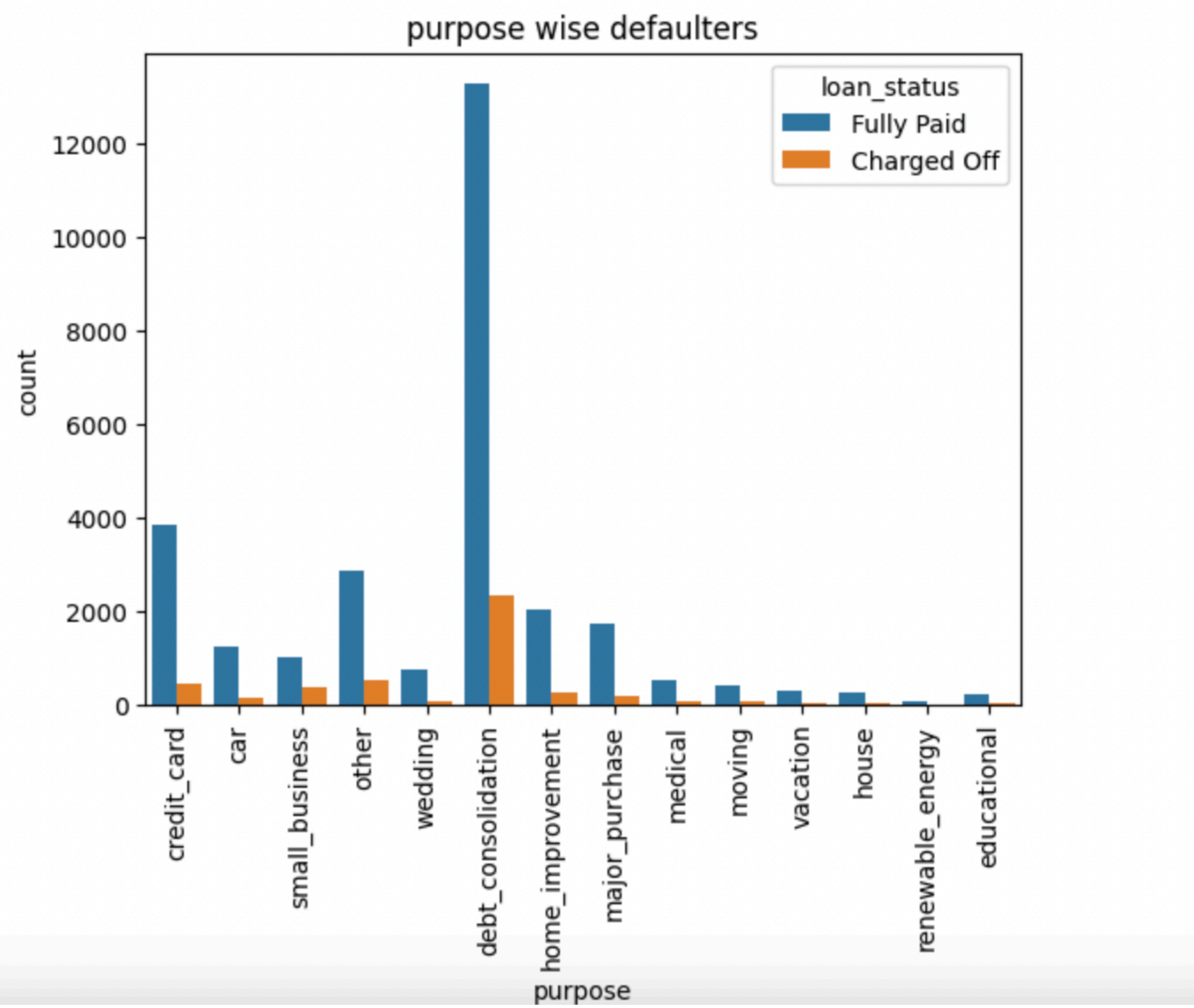
Income Bracket

- A significant number of borrowers fall within the income range of 40k-60k.
- Borrowers earning above 80 lakhs have successfully repaid their loans, with a lower rate of defaults compared to other income brackets.



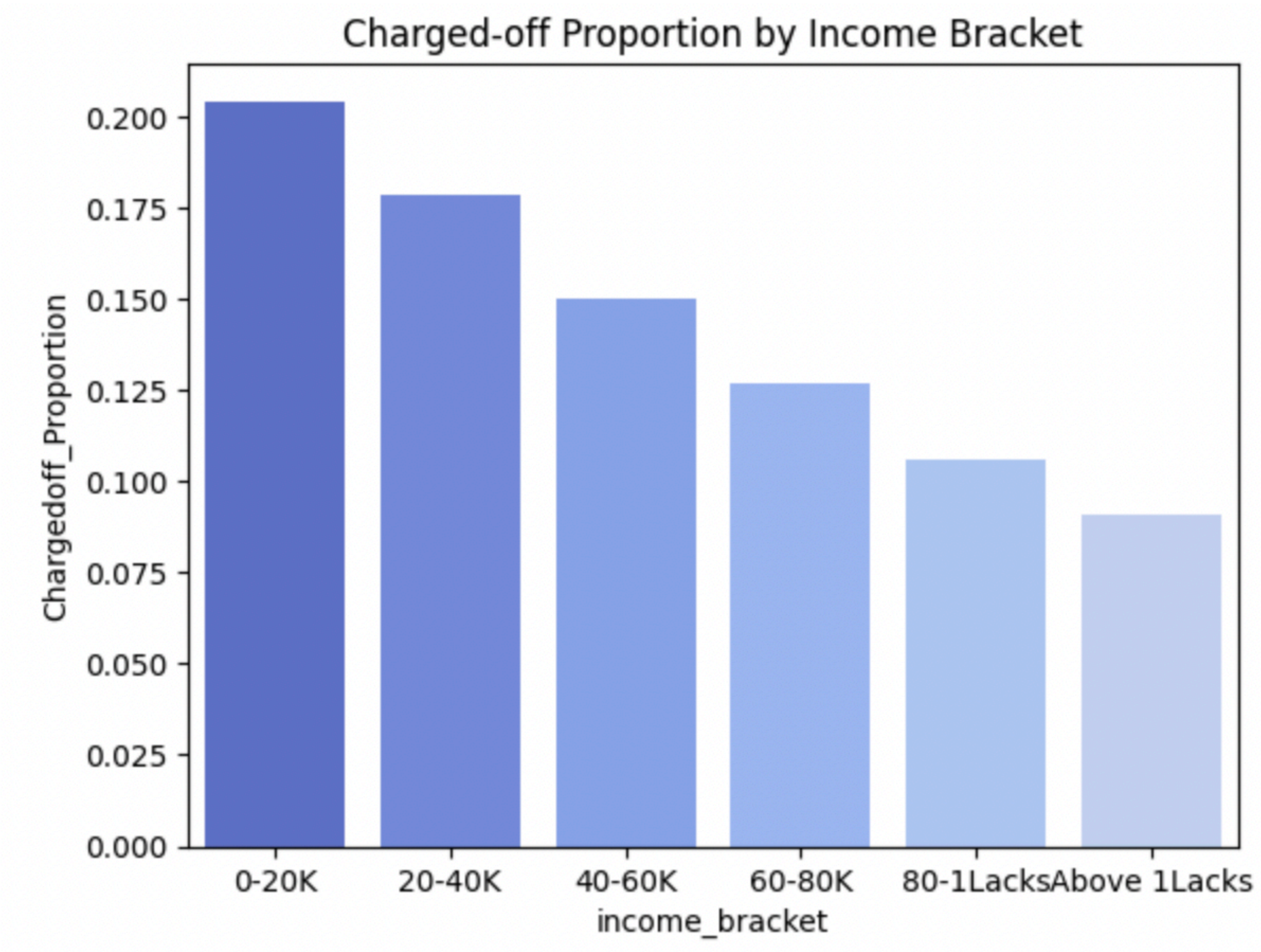
Purpose wise defaulter count

- The majority of loan applications are for debt consolidation, followed by credit card loans, with a higher number of defaulters also coming from debt consolidation.



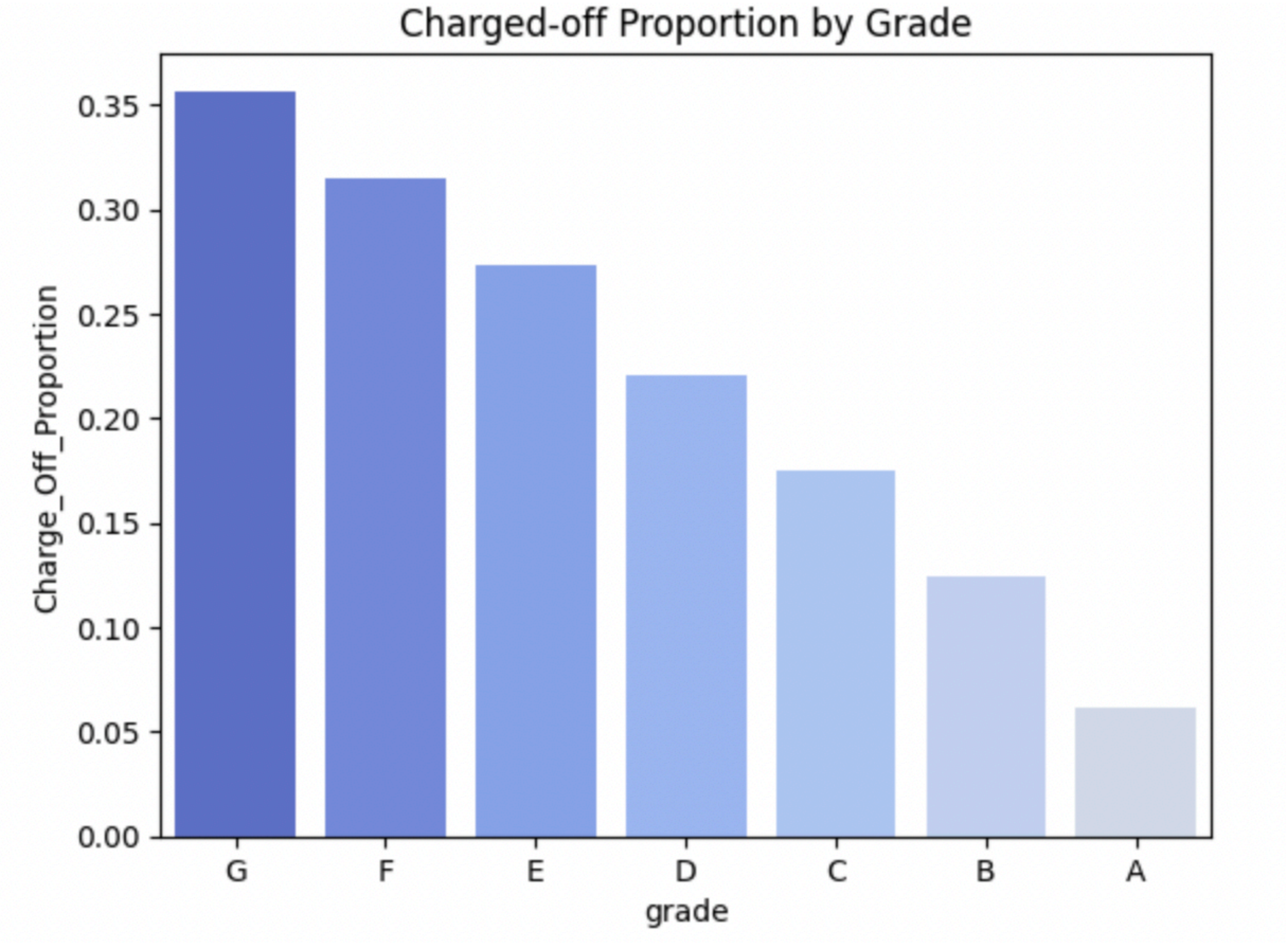
Charged off proportion vs income bracket

- Borrowers in the lower income bracket (0 to 20,000) have a higher likelihood of defaulting on loans.
- As income levels increase, the rate of loan defaults decreases.



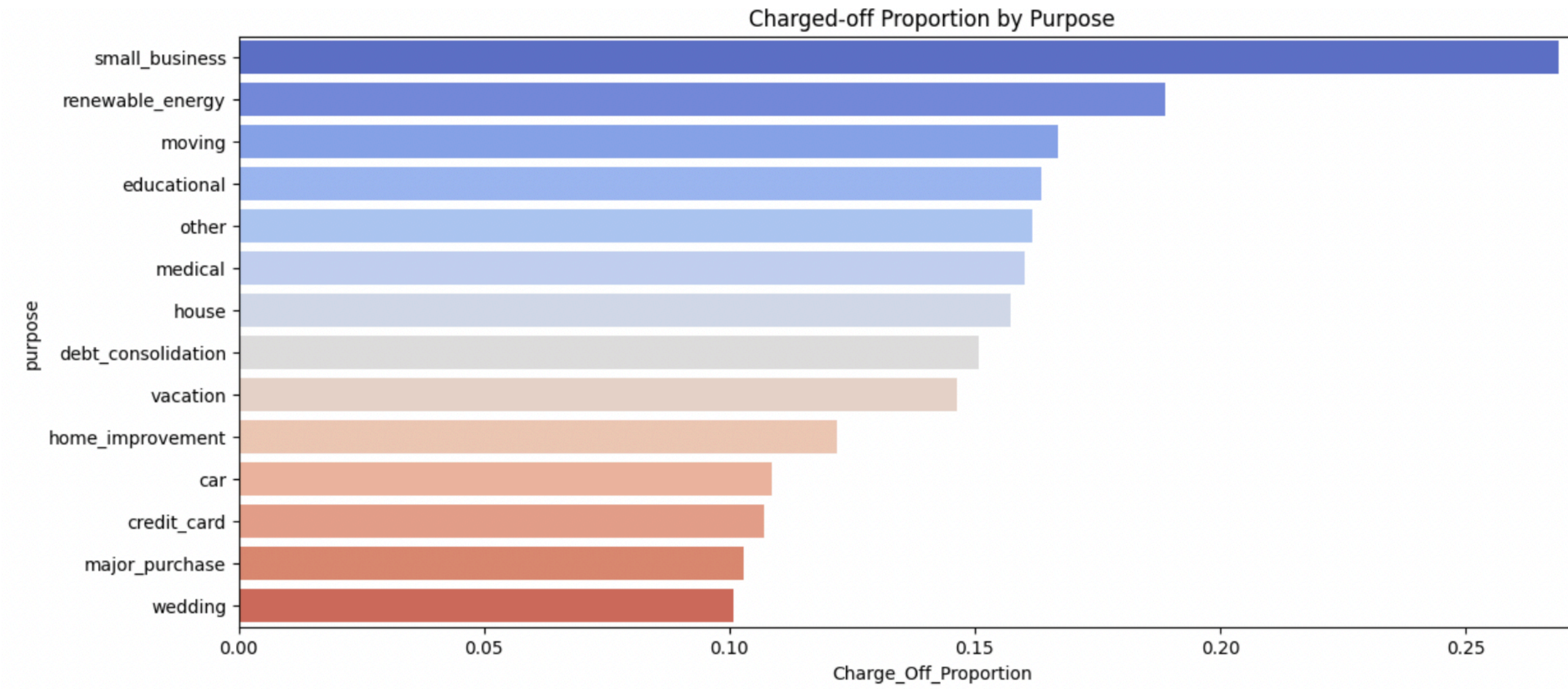
Charged off vs Grade

- The majority of loan applicants are seeking debt consolidation, followed by those applying for credit card loans, and a higher number of defaulters are also from the debt consolidation category.



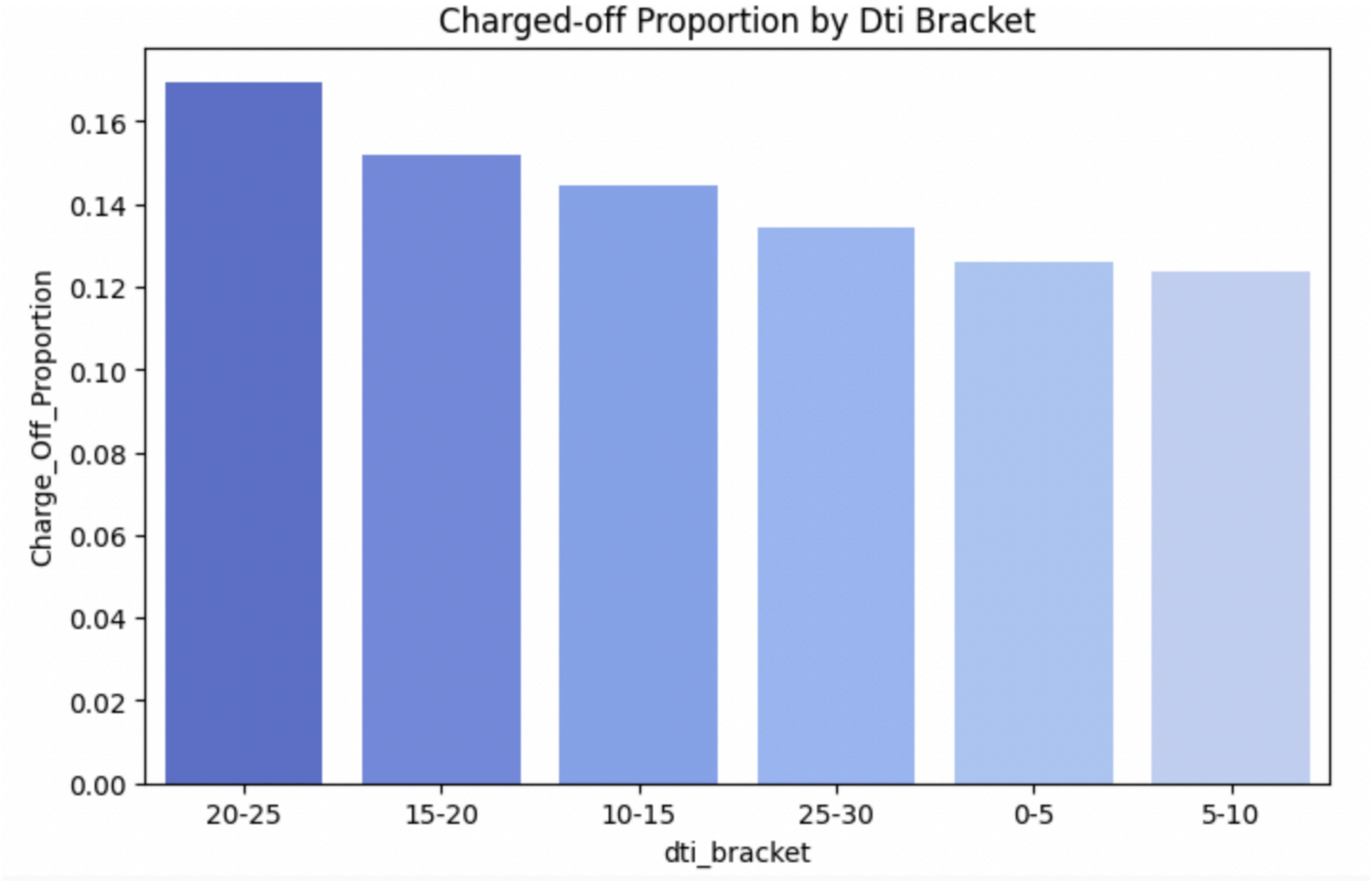
Charged off vs purpose

- Borrowers taking loans for small businesses are nearly three times more likely to default compared to those borrowing for weddings.
- Lending to small businesses is much riskier due to their higher failure rates and limited assets, making it challenging for them to repay loans.

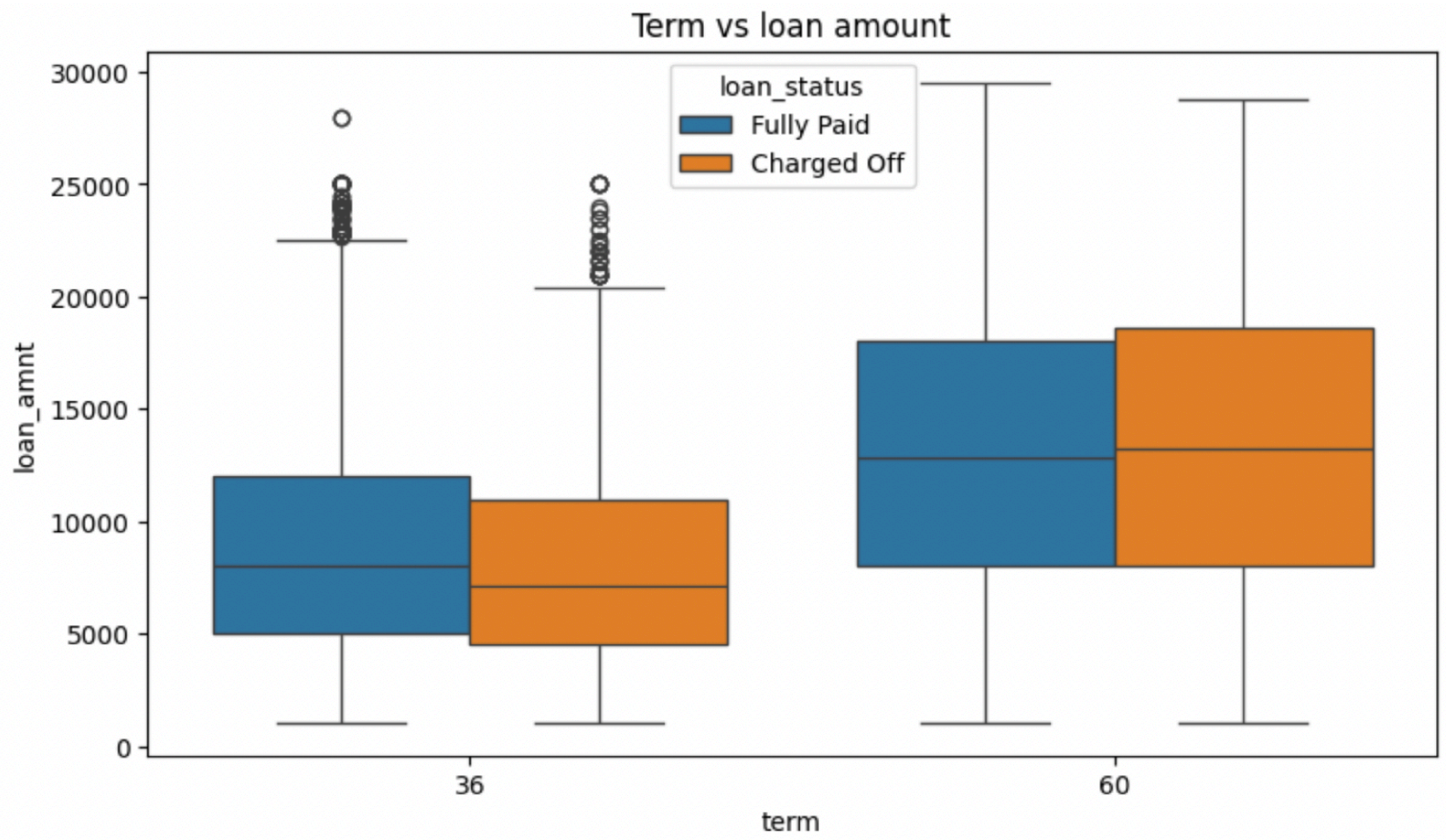


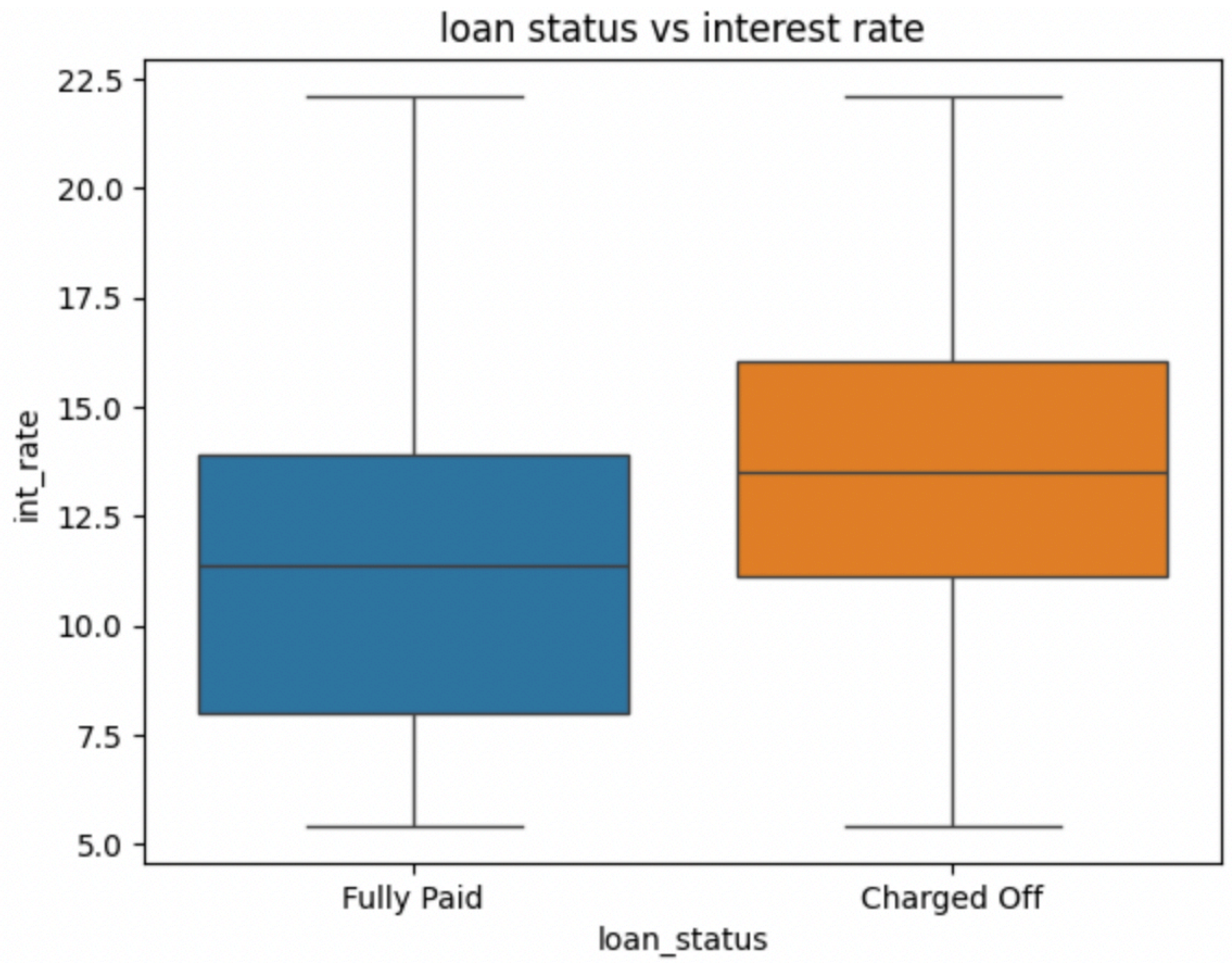
Charged Off Vs DTI

- This chart clearly indicates that a higher debt-to-income ratio significantly increases the likelihood of loan defaults.
- Individuals with a debt-to-income ratio between 20-25 are at a higher risk of not repaying their loans, as their liabilities exceed their ability to pay, raising the risk of default.
- Those with a debt-to-income ratio between 0-5 or 5-10 have a much lower probability of defaulting on their loans.



Term Vs loan Amount & Loan Status vs rate

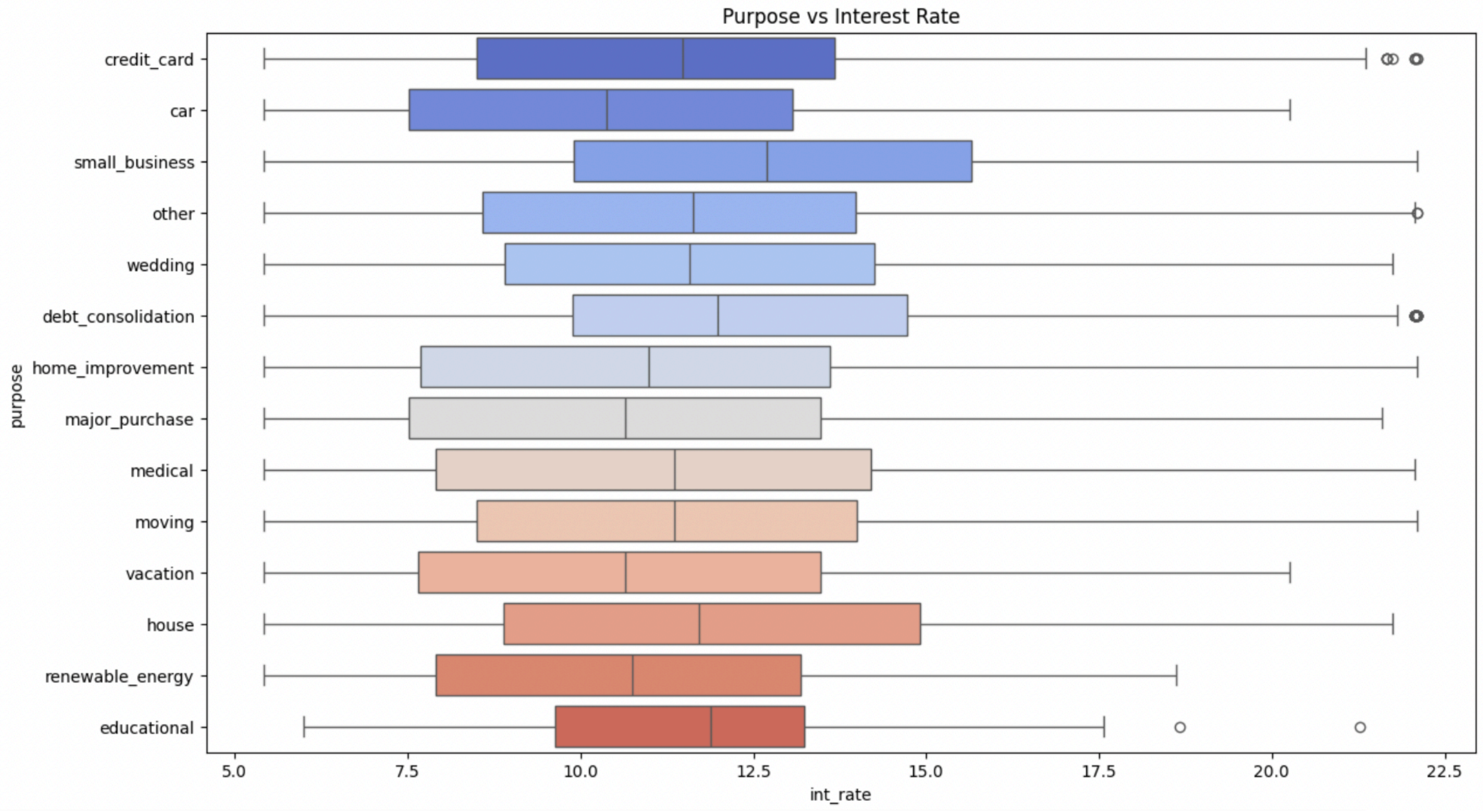




- Borrowers are defaulting on their loans because of elevated interest rates.
- As interest rates rise, Equated Monthly Installments (EMIs) also increase, making it difficult for borrowers to manage due to the higher interest burden.
- The rate of loan charge-offs is significantly higher for 5-year loan terms compared to 3-year terms.

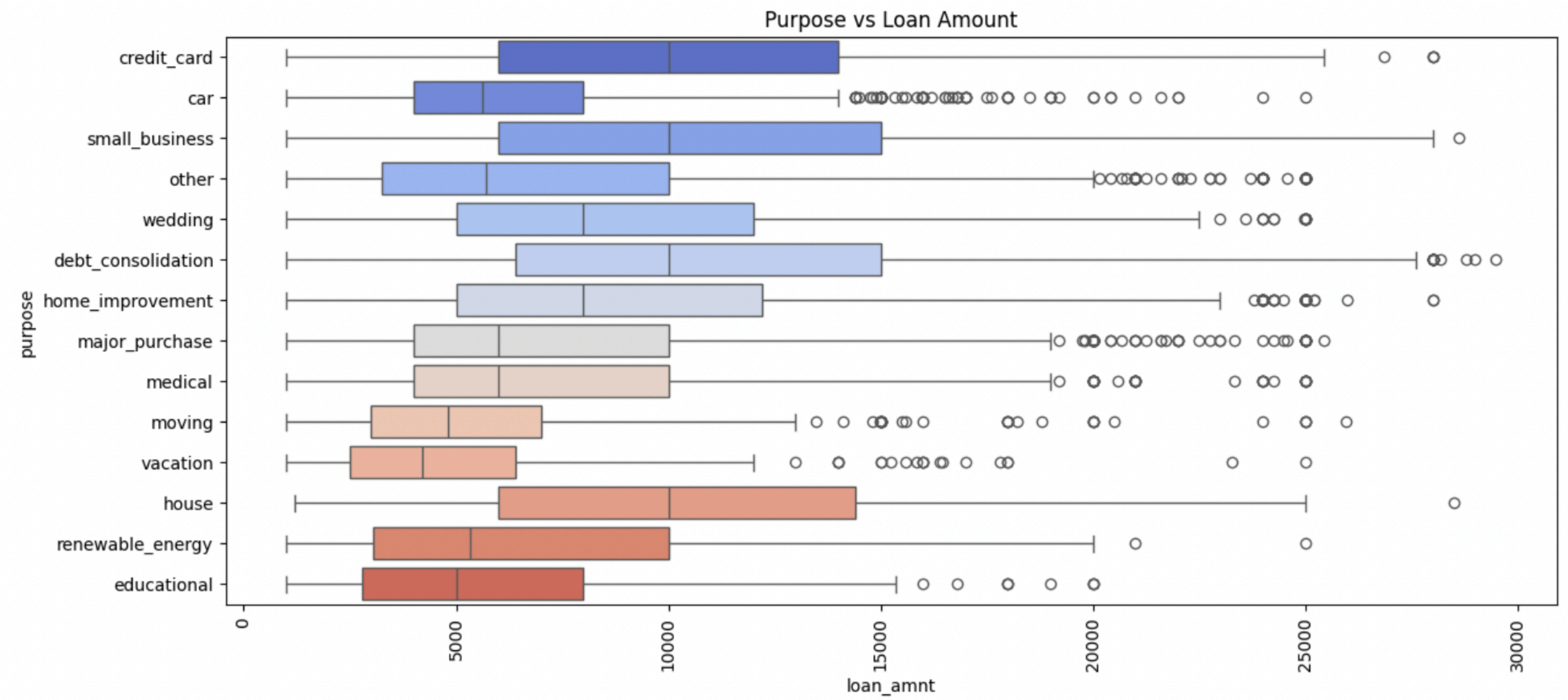
Purpose vs interest rates

- Borrowers who have taken out loans for small businesses, debt consolidation, and housing are repaying their loans at higher interest rates.
- Interest rates tend to be particularly high for borrowers with loans for small business purposes, which could lead to increased rates for these individuals.



Purpose Vs Loan Amount

- Borrowers who have taken loans for small businesses and debt consolidation have received larger amounts compared to other loan categories.
- A higher loan amount tends to correspond with a higher interest rate compared to smaller loans.



Recommendations

- Lending Club should prioritize issuing loans to borrowers with an income exceeding 80 lakhs, as they are less likely to default.
- Lending Club should focus on lending to borrowers with higher credit grades (A, B), as they are more likely to repay their loans compared to lower grades like (E, F, G).
- For small business and debt consolidation loans, Lending Club should offer smaller amounts since larger loan sizes lead to higher EMIs, making it harder for borrowers to repay.
- Due to high interest rates, borrowers struggle to repay their loans. Reducing the interest rate to 12% would lower the EMIs, making it easier for borrowers to meet their payments on time.
- Borrowers with mortgages are at a higher risk of default because they already have monthly mortgage payments.
- Lending Club should focus on lending in states like MS, DC, and DY, where borrowers have a lower chance of defaulting.
- Borrowers with a higher number of public record bankruptcies are more likely to miss payments.
- Lending Club should prioritize borrowers with lower debt-to-income ratios, as this reduces the chances of default.
- It’s important for Lending Club to thoroughly verify applicants before granting them loans.