Lending Club Case Study

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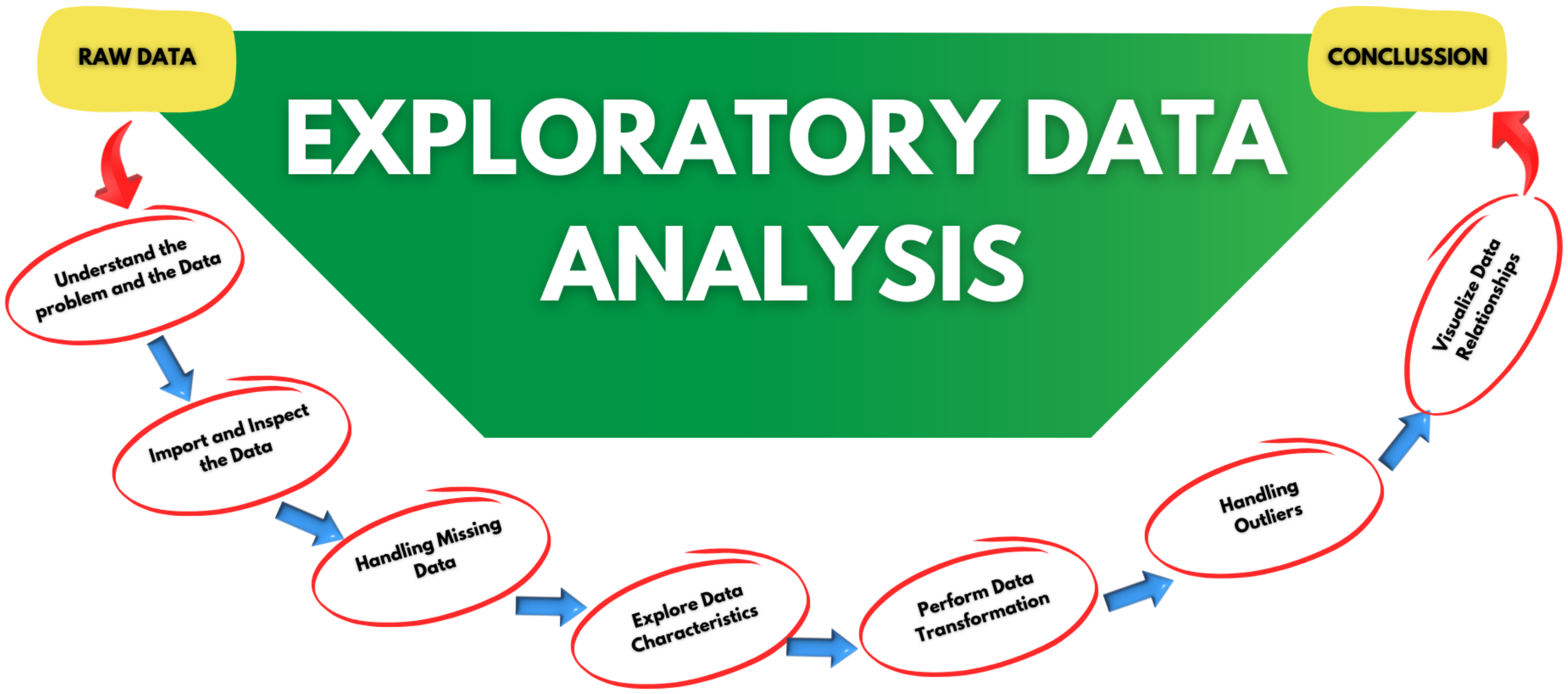


Introduction

In this case study, we are attempting to solve a real-world business problem using **Exploratory Data Science** techniques. Also, we will develop a basic understanding of risk analytics in banking and financial services and understand how data is used to minimize the risk of losing money while lending to customers.

Business Understanding

A **consumer finance company**, which specialises in lending various types of loans to urban customers, when receives a loan application, 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.

Business Objective

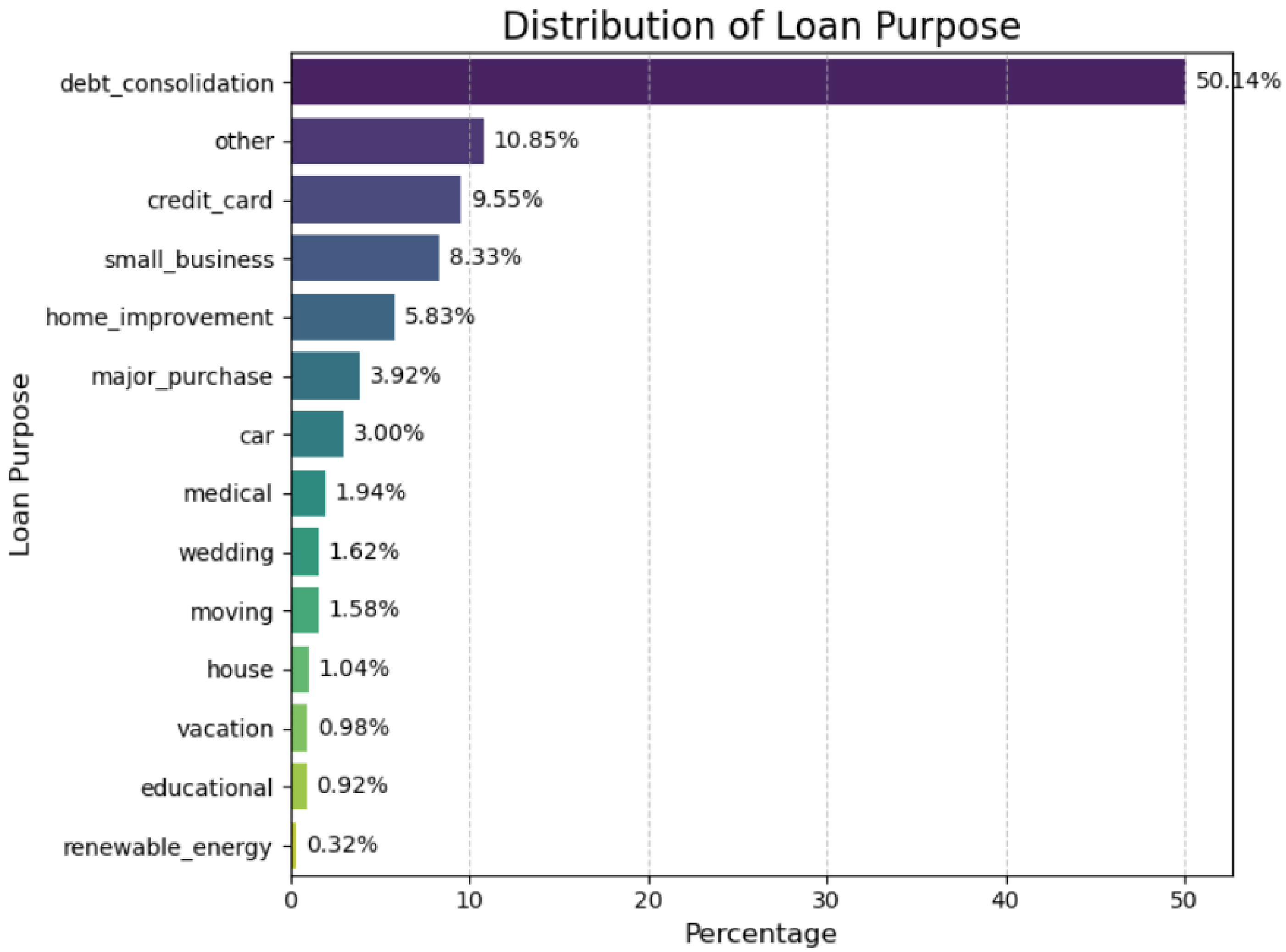
Company wants to understand the driving factors (or driver variables) behind loan default, i.e., the variables which are strong indicators of default. The company can utilize this knowledge for its portfolio and risk assessment

The data given to us contains information about past loan applicants and whether they 'defaulted' or not. **The aim** is to identify patterns which indicate if a person is likely to **default**, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

Distribution of loan Purpose

Debt Consolidation loan is the most popular and defaults the most

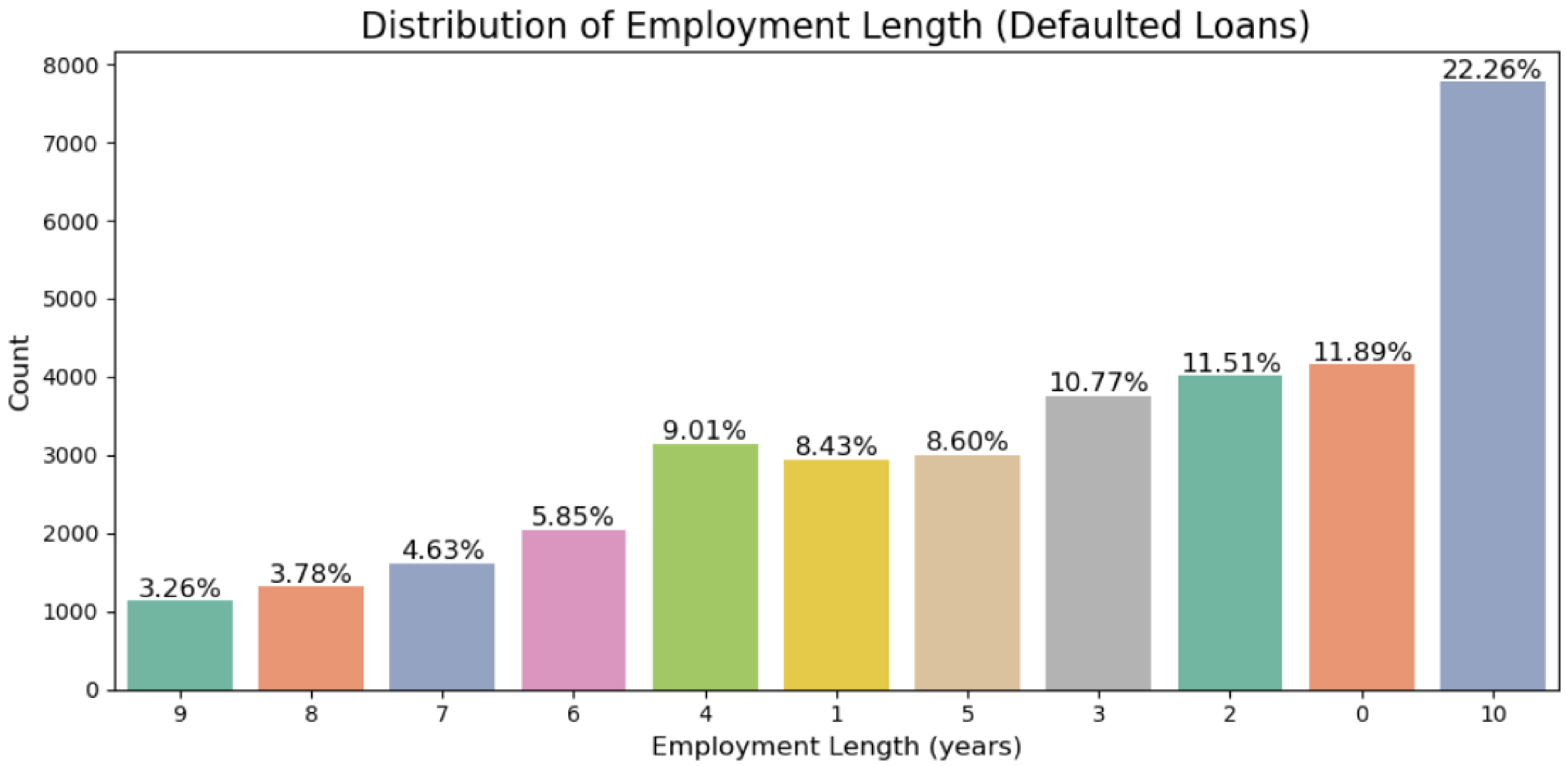
- 50.14% debt consolidation loans
- 10.85% others
- 9.55% credit card loans
- 8.33% small business loan



Distribution of Emp Length

Borrowers having more than 10 year of employment are at risk of default

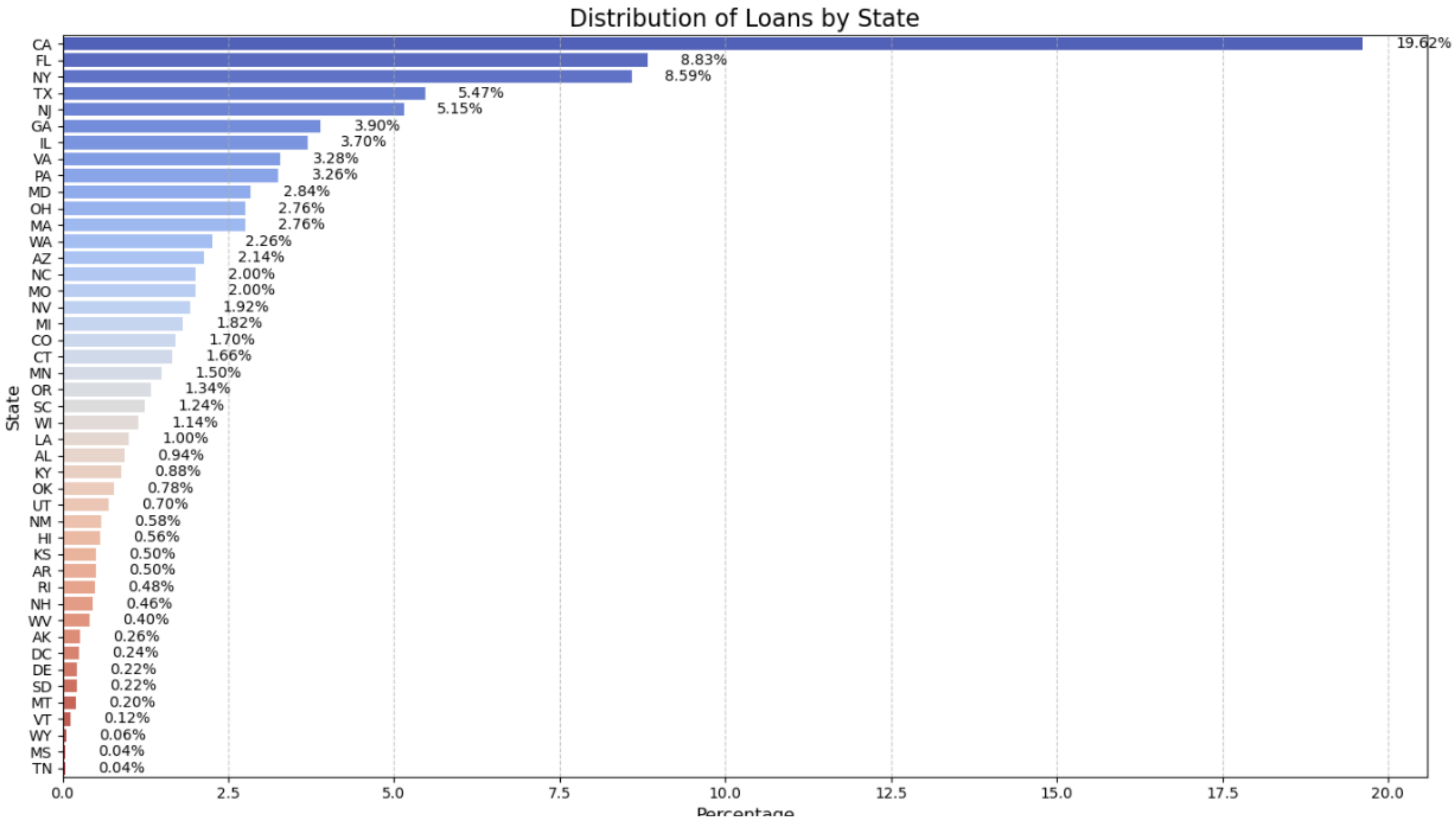
- 22.26% 10 years & more
- 11.89% less than 1 years
- 11.51% 2 years of employment
- 8.60% 3 years of employment



Distribution of State

Borrowers from California are at higher risk of default

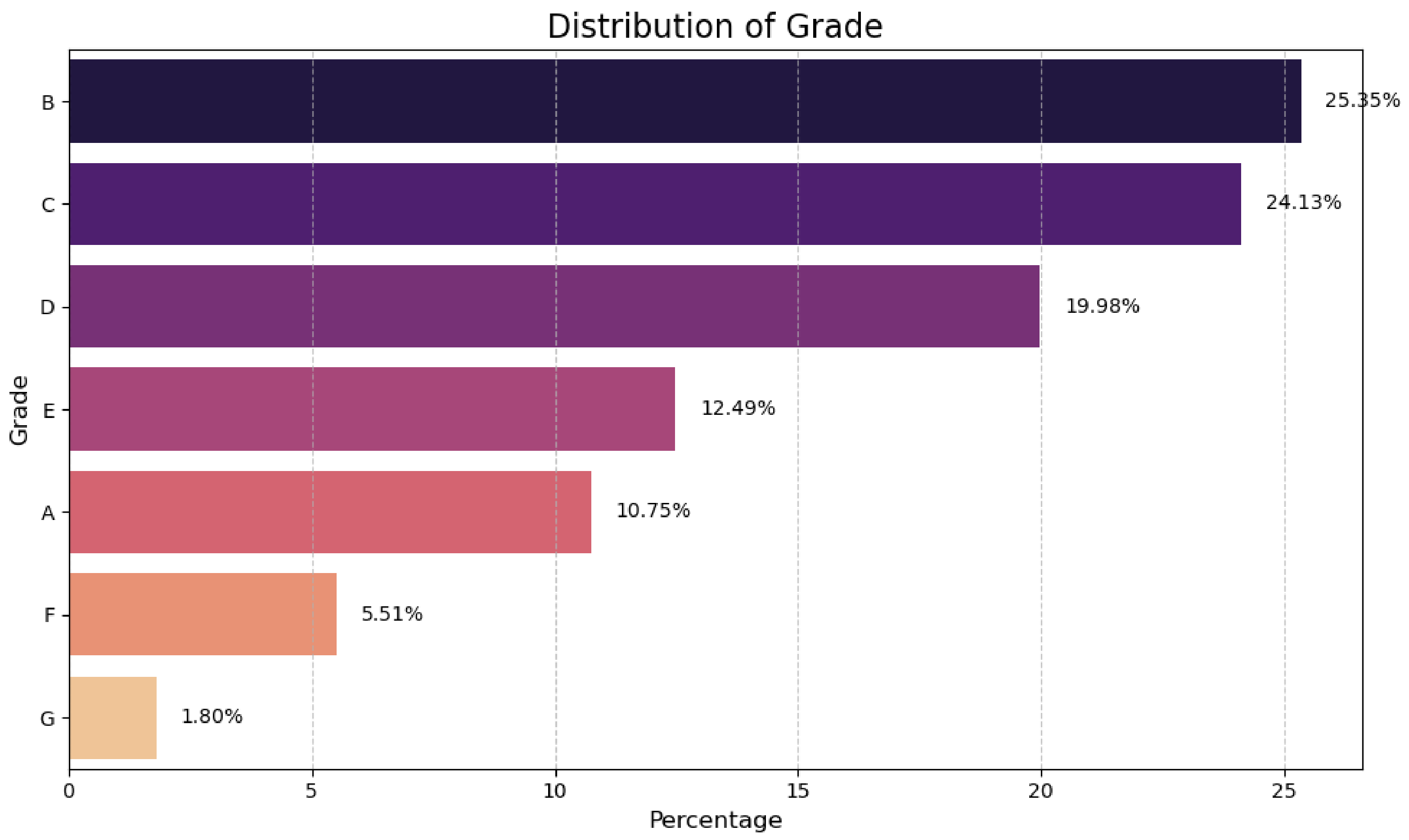
- 19.62% CA (California)
- 8.83% FL (Florida)
- 8.59% NY (New York)
- 5.47% TX (Texas)



Distribution of Grade

Borrowers who have LC assigned loan grade of B & C are at greater risk of default.

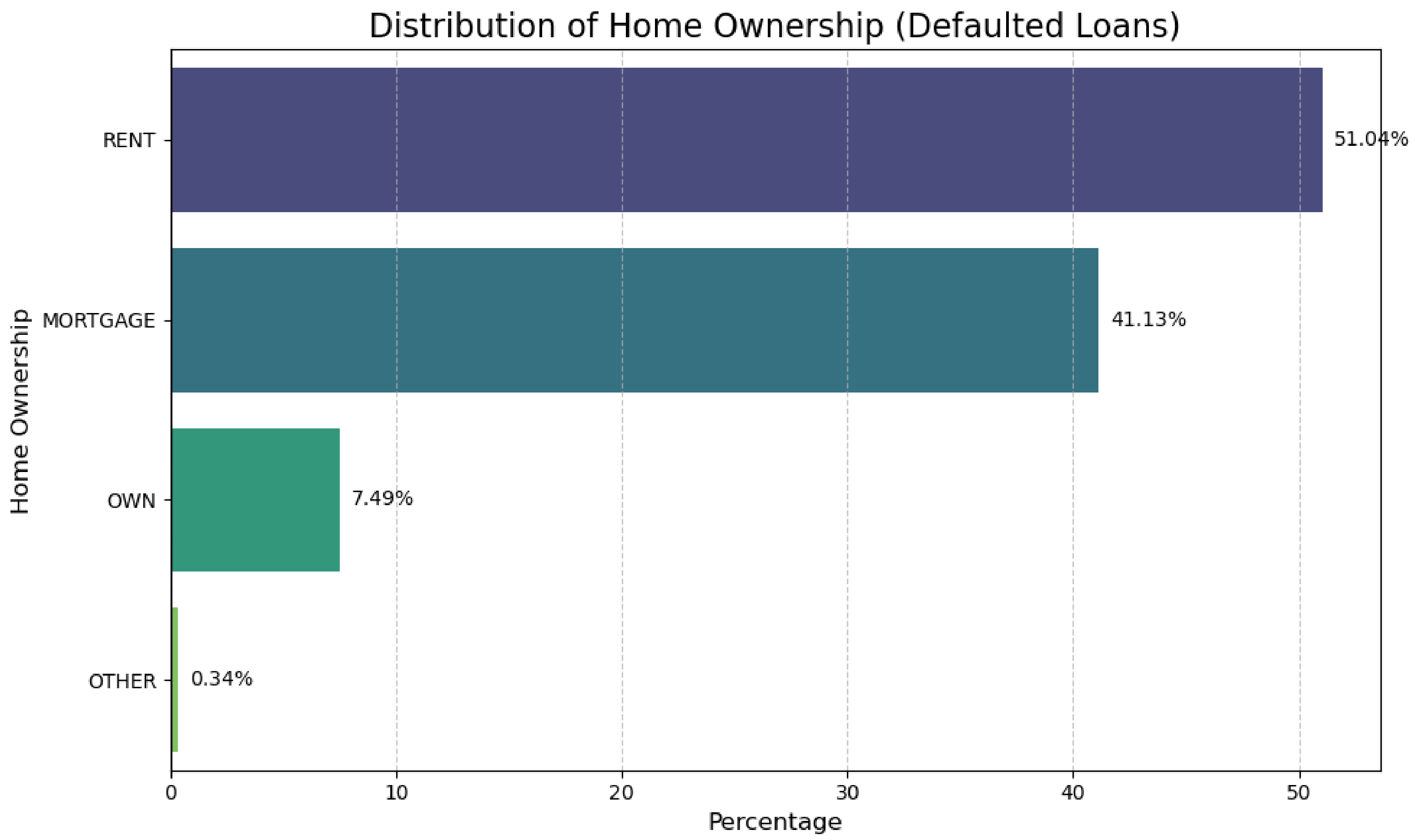
- ➢ 25.35% Grade ‘B’
- ➢ 24.13% Grade ‘C’
- ➢ 19.98% Grade ‘D’
- ➢ 12.49% Grade ‘E’



Distribution of Home Ownership

Borrowers staying on Rent are at greater risk of default.

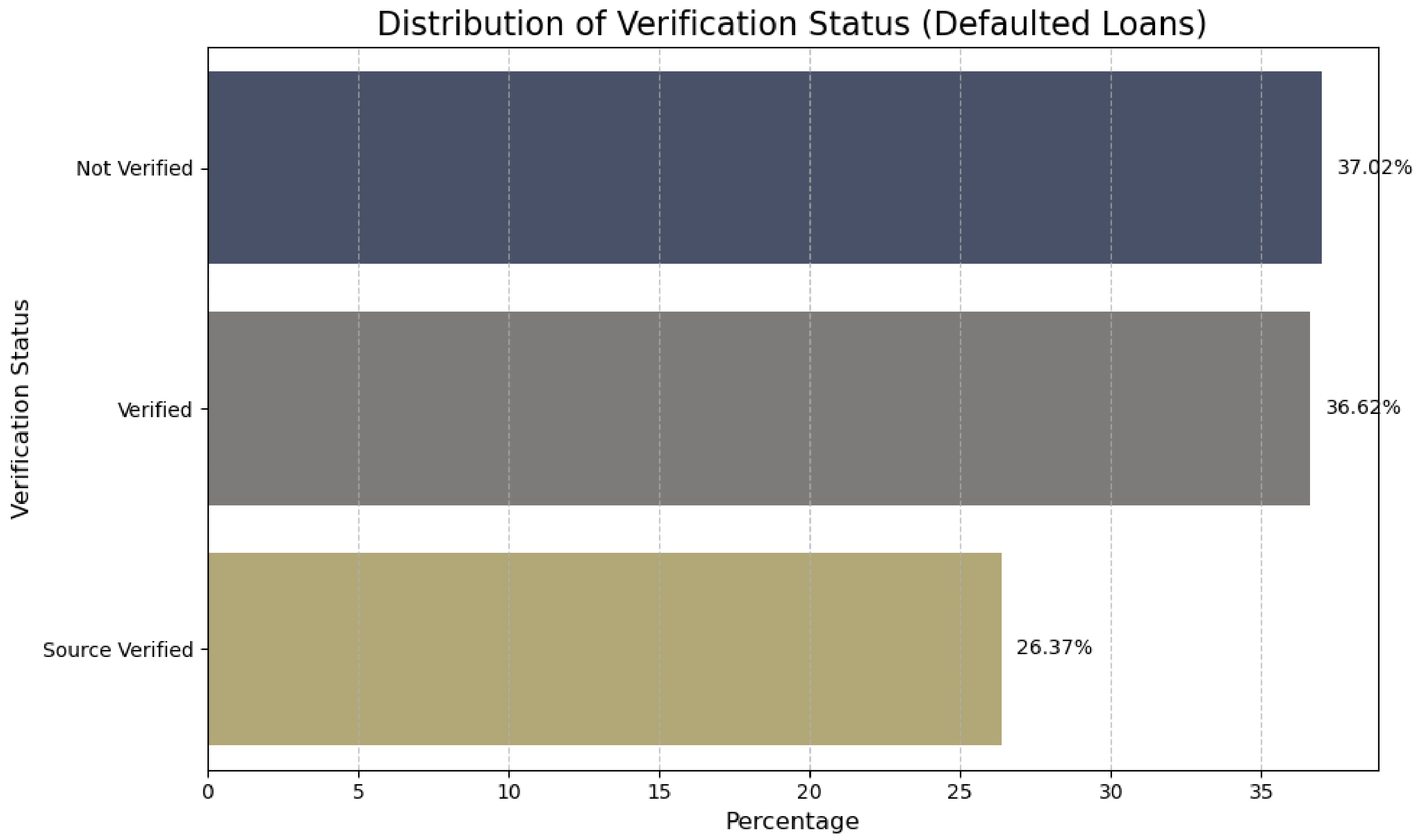
- 51.04% Rent
- 41.13% Mortgage
- 7.49% Own



Distribution of Verification Status

Borrowers whose income was source verified by LC are at low risk of default

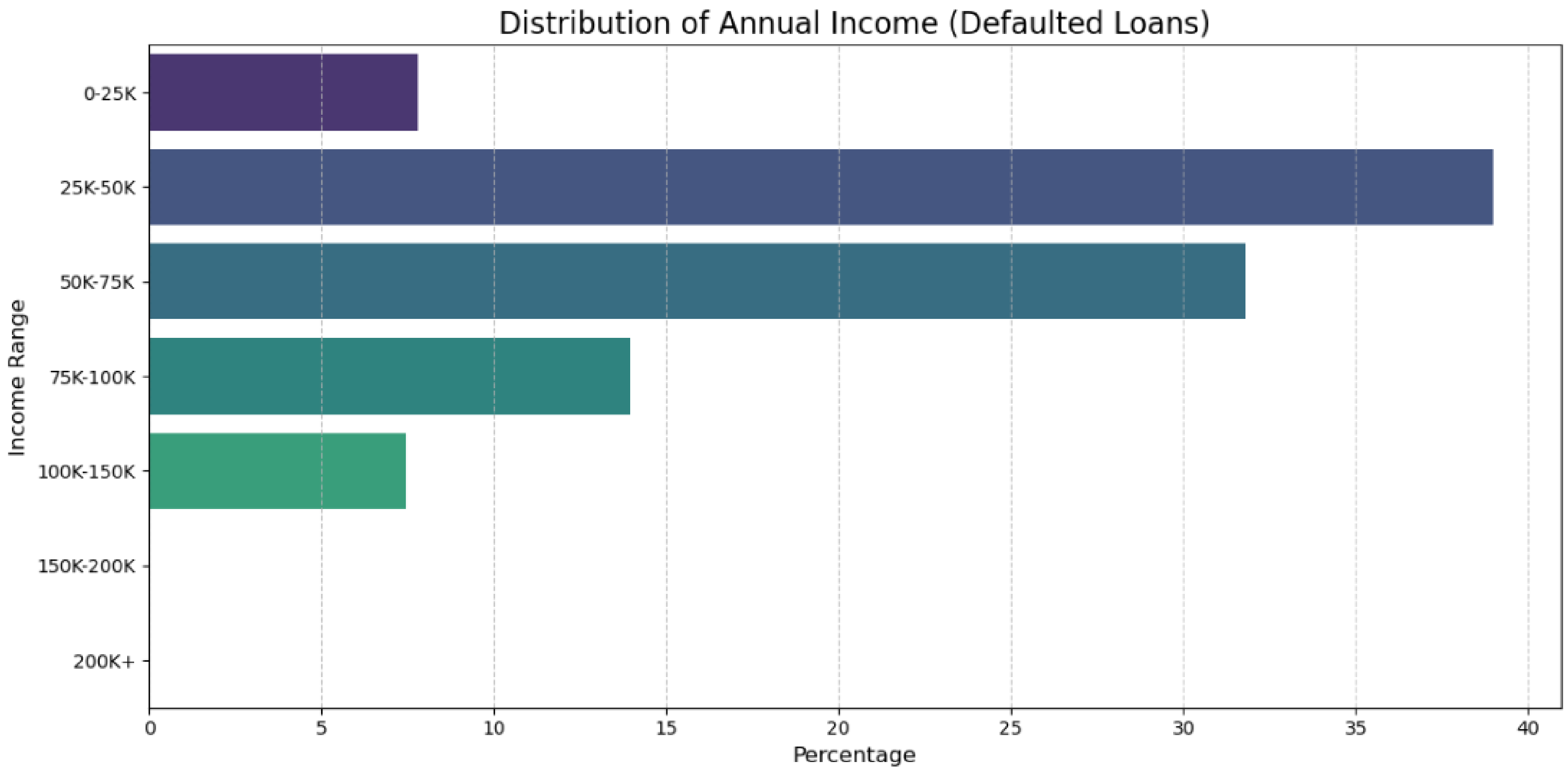
- ➢ 37.02% Non Verified by LC
- ➢ 36.62% Verified by LC
- ➢ 26.37% Source Verified by LC



Distribution of Annual Income

Borrowers having Annual Income range of 25K to 75K are at greater risk of default.

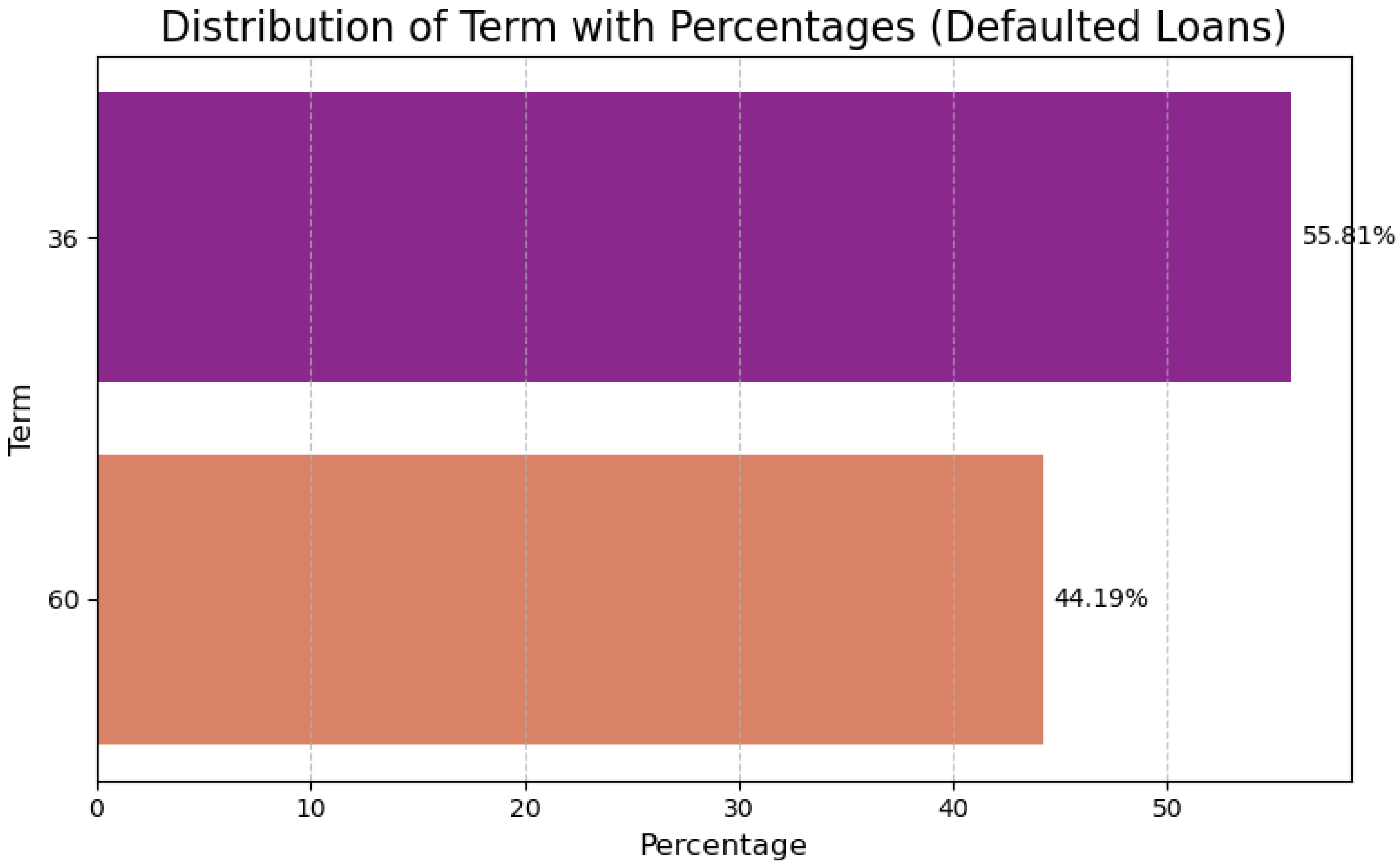
- 39% - 25K to 50K Annual Income
- 32% - 50K to 75K Annual Income
- 14% - 75K to 100K Annual Income



Distribution of Term

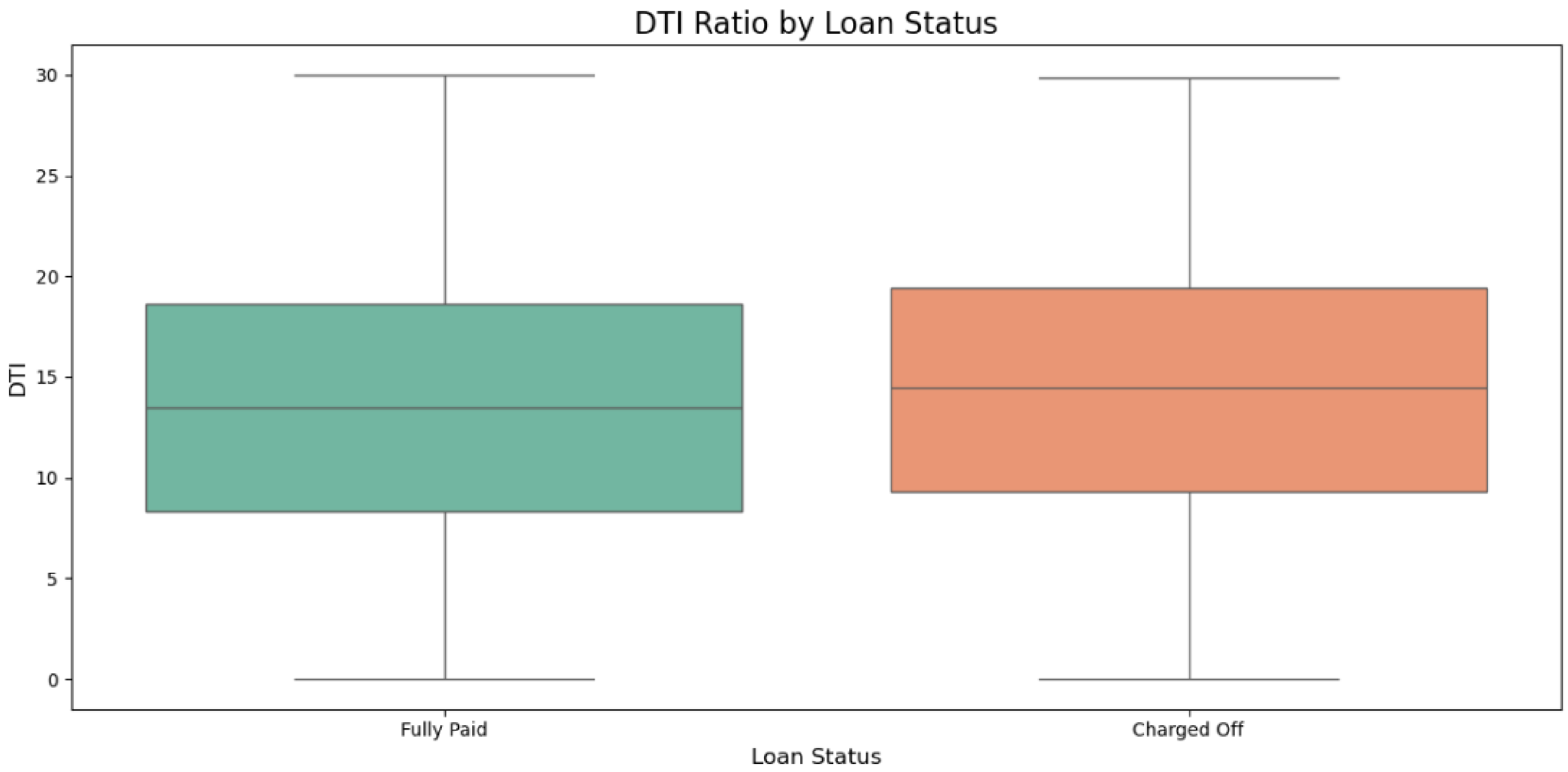
Borrowers with both 36-monthor 60-month payment term are equally at risk of default.

- ➢ 55.81% 36-month Term
- ➢ 44.19% 60-month Term



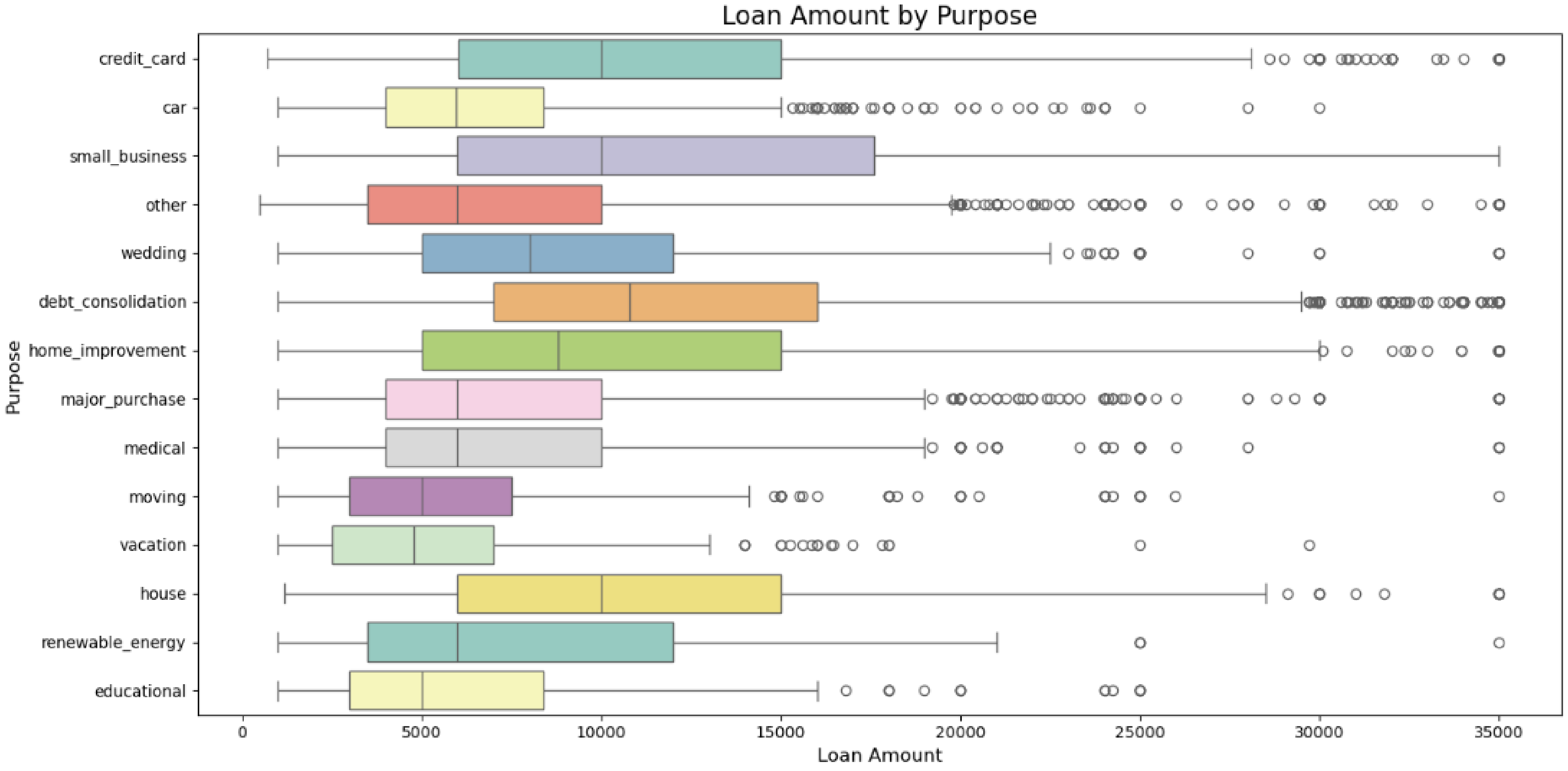
DTI Ratio vs Loan Status

Defaulted loans (Charged Off) generally have higher median DTI ratios compared to fully paid loans. People with a higher percentage of debt relative to income are at greater risk of default.



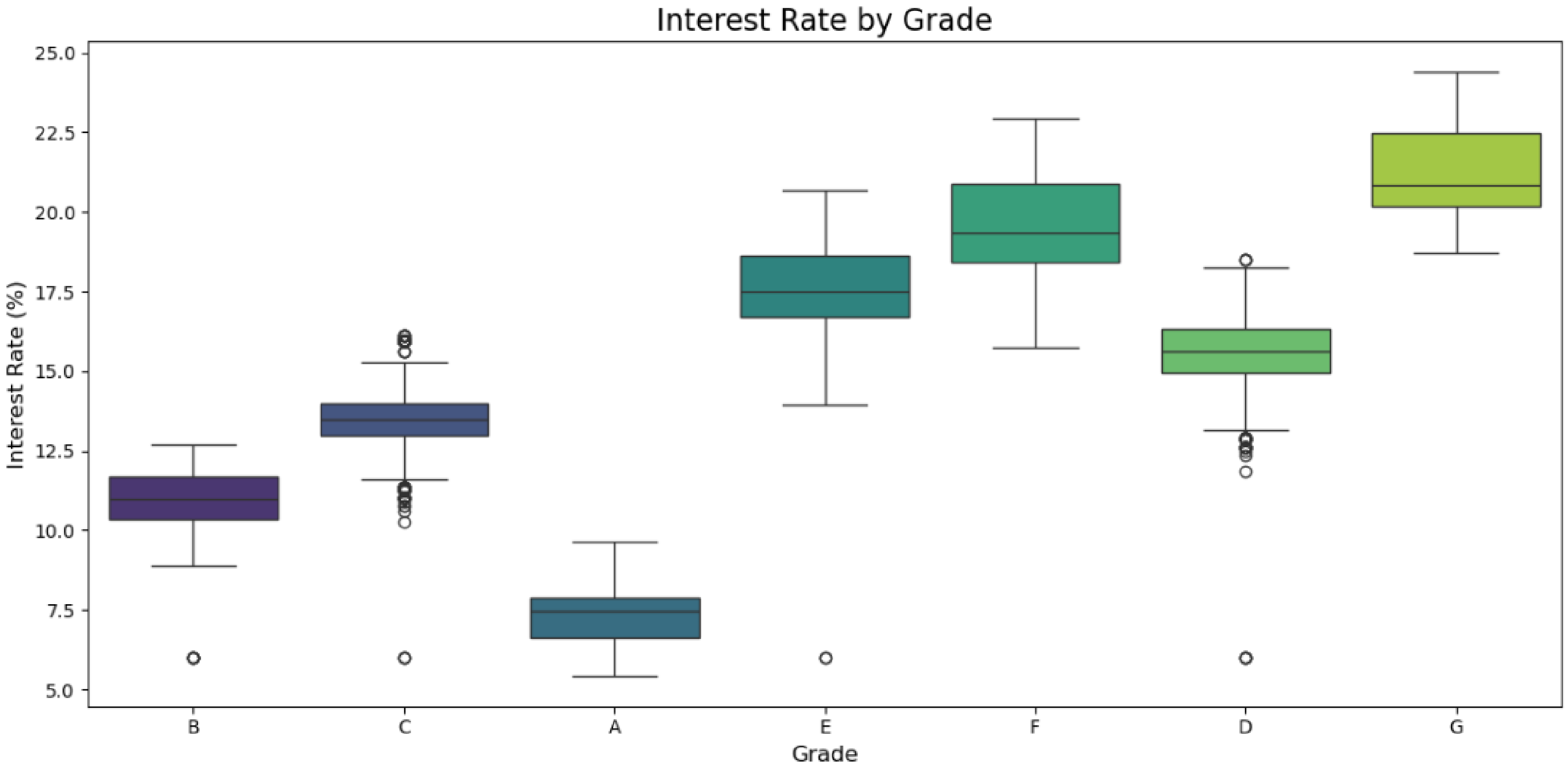
Purpose of Loan vs Loan Amount

Loans for small business and debt consolidation tend to involve higher amounts. Higher loan amounts may carry greater risk of default depending on the borrower’s purpose.



Relationship between interest rate and Grade

Interest rates increase with lower loan grades. Borrowers with lower grades (e.g., E, F) pay significantly higher interest rates, reflecting the increased risk associated with these loans.



Conclusion

Major Driving factor which can be used to predict the chance of defaulting and avoiding Credit Loss are:

- **Annual Income**
- **Grade**
- **DTI**
- **Verification Status**
- **State**

Considerations

- **More scrutiny while lending money to states like CA, FL, NY & TX**
- **Advisable to lend money after doing Source Verification**
- **Careful with Borrowers having high DTI value**
- **Scrutinize Borrowers who are having annual income in the range of 25K to 100K and who have 10+ years or less than 1 years of employments**