Lending Case Study Analysis

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Objective

The objective of this case study is to mitigate credit loss by effectively identifying high-risk loan applicants. By employing Exploratory Data Analysis (EDA), the study seeks to discern key factors influencing loan default.

By understanding the underlying drivers of default, the company can streamline its lending practices, minimize exposure to risky borrowers, and ultimately reduce the volume of defaulted loans. This proactive approach not only safeguards the company's financial stability but also enhances its ability to make informed lending decisions.

Problem Statement

High Default Rates:

Our lending portfolio has been experiencing a high rate of loan defaults.

Objective:

Identify key factors that contribute to loan defaults and develop a predictive model to mitigate these risks.

Analysis Approach

Data Cleaning - Handling missing values, outlier detection.

Univariate Analysis - Uunderstand basic characteristics and distribution of each variable

Bivariate Analysis - Identify correlations and dependencies to find potential risk factors

Correlation Matrix - Identify variables that have a high correlation with loan default .

Conclusion - Summary of key insights.

Data Cleaning

Missing Value Treatment

- Removing rows or columns with excessive missing values if they exceed a certain threshold.
- Impute missing numerical values with mean, median, or mode.

Outlier Detection and Treatment:

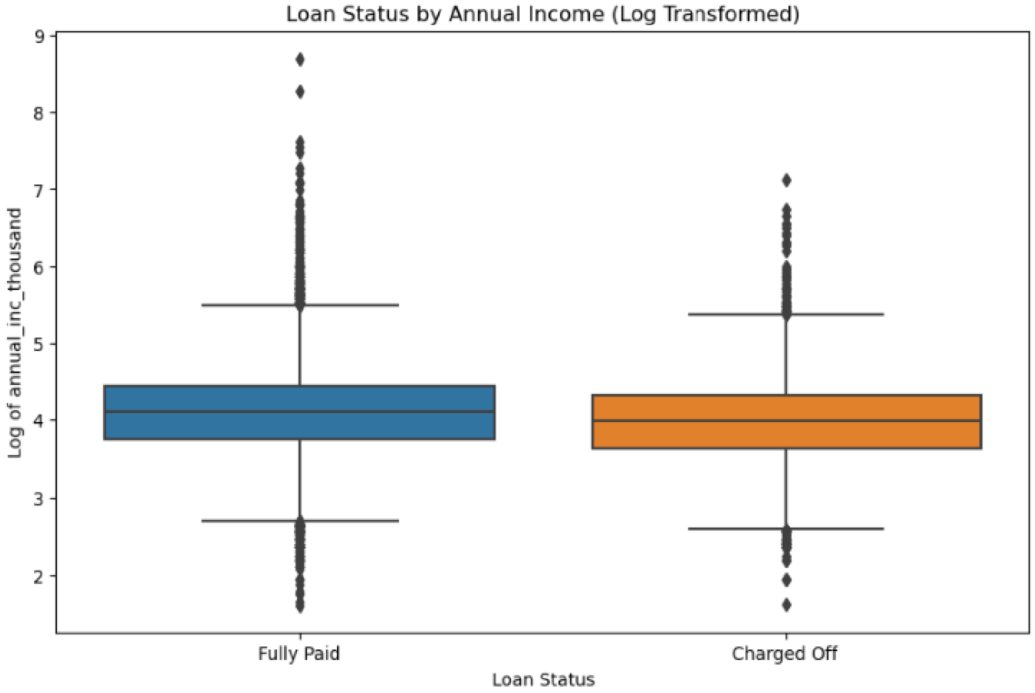
- Transforming variables to reduce the impact of extreme values
- Dropping outliers if they are errors.

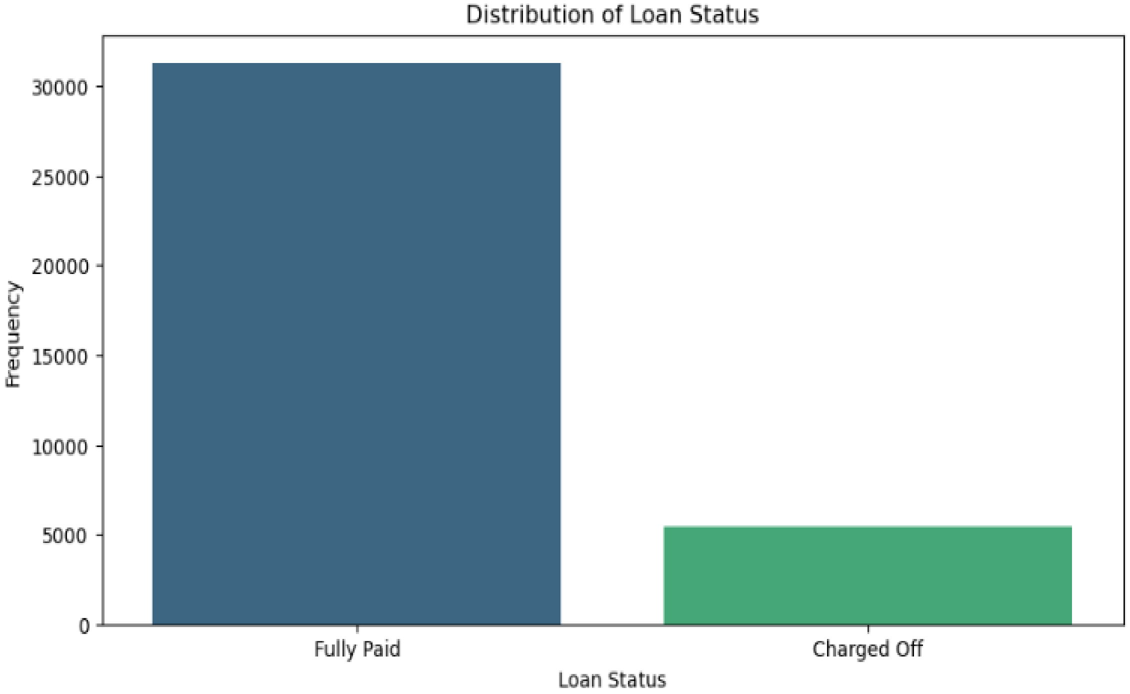
Duplicate Records Removal:

- Removed duplicate records to avoid biased analysis and redundant data processing

Univariant Analysis

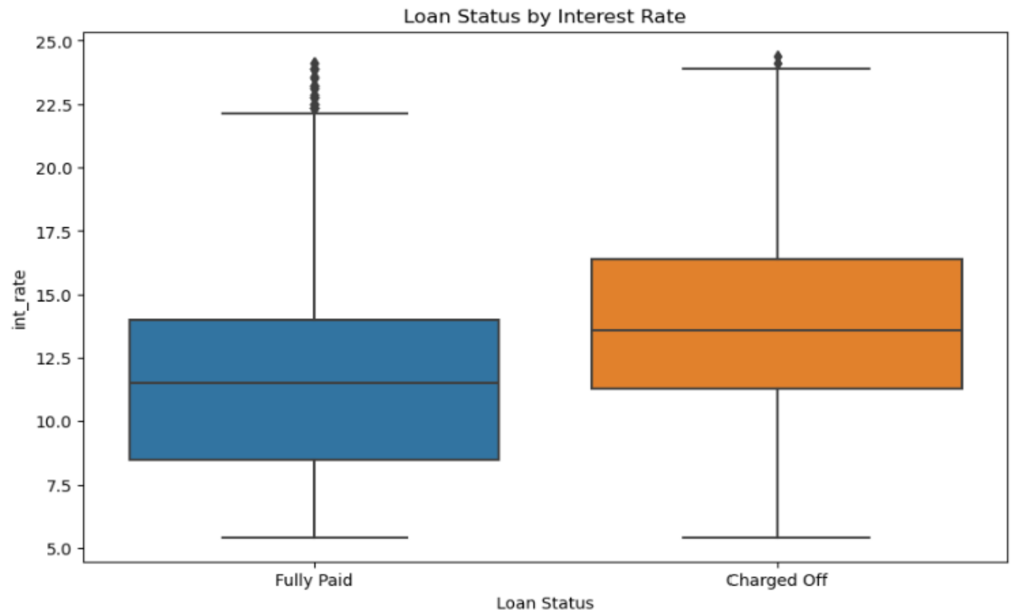
Income :- By looking Graph, we can say that people with Lower income rate tend to default the Loans

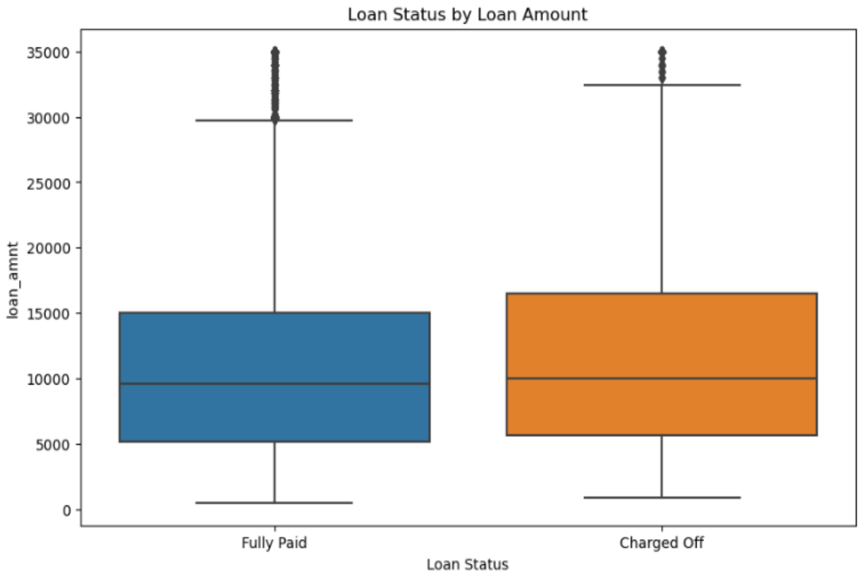




Loans

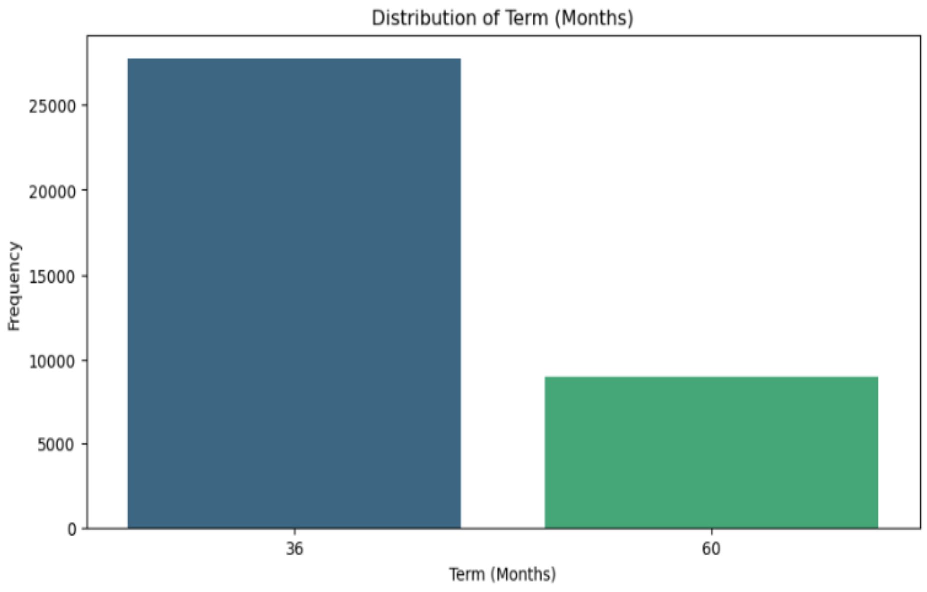
- People with higher interest rate of loans tend to default the loans.
- Larger loan amounts show a higher tendency towards being default.

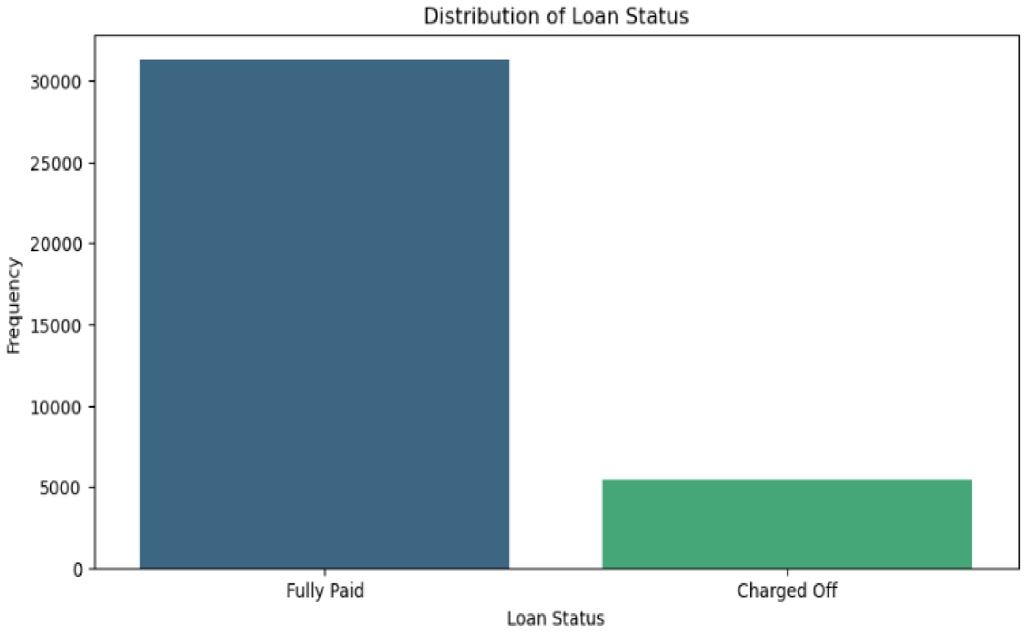




Tenure

The majority of loans have a term of 36 months and majority are fully paid.

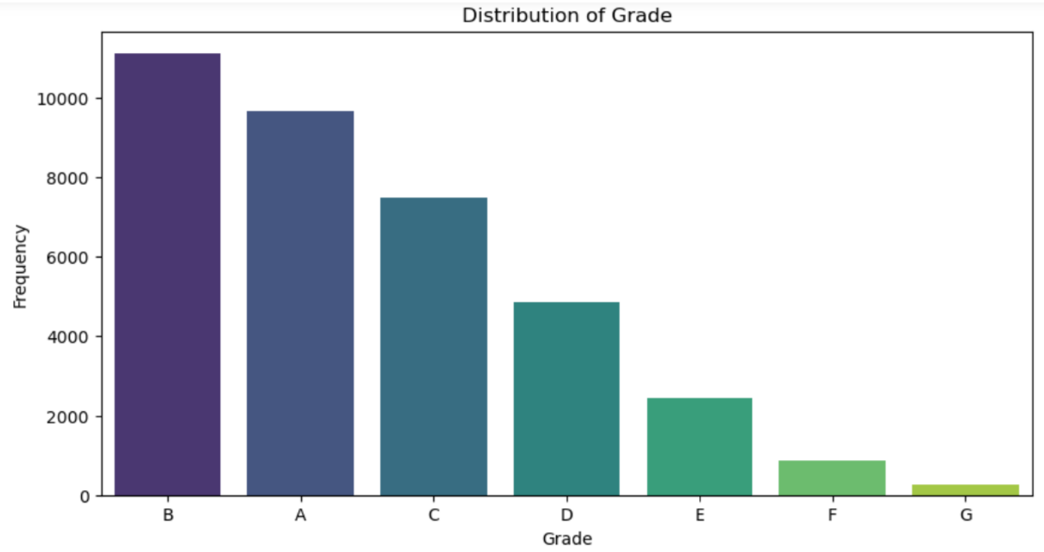


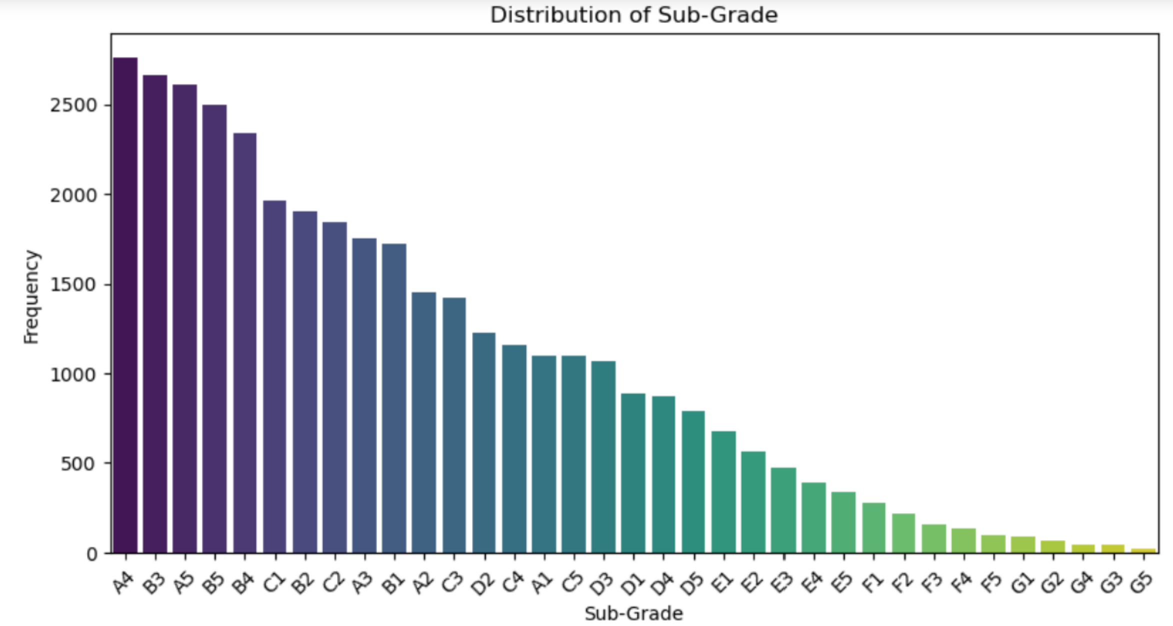


Grades

Grade :- Most loans are graded B , A and C, indicating a moderate risk profile of the loan applicants.

Sub-Grade :- Sub-grades provide a finer distribution within grades, with sub-grades A4, B3, and A5 being the most common.

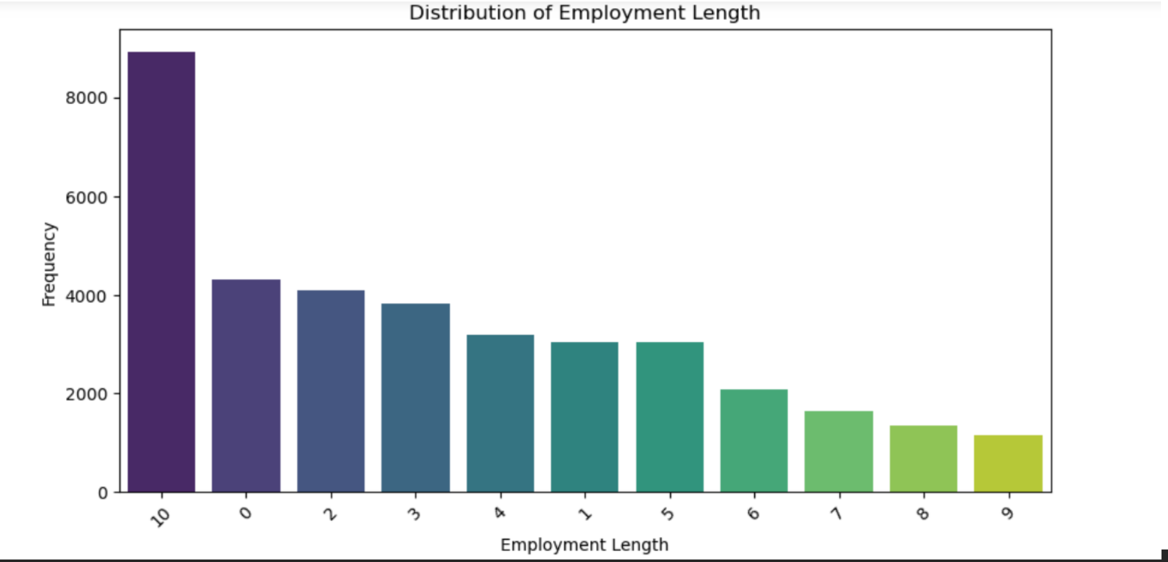


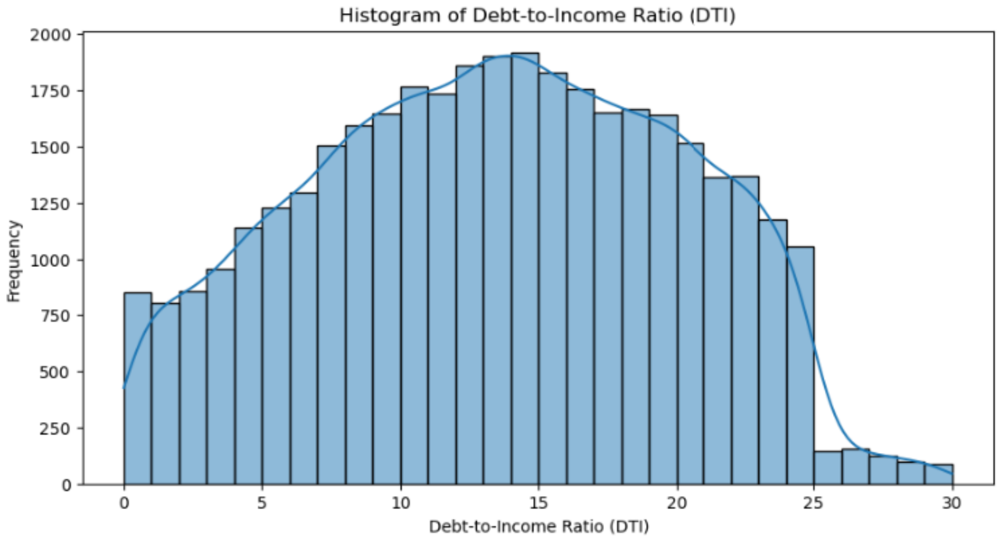


Observation

Employment Length :- Most borrowers of loan have 10+ years of employment.

Debt-to-Income Ratio (DTI) : - The DTI ratio is mostly below 30%, indicating that most borrowers have a manageable level of debt relative to their income.

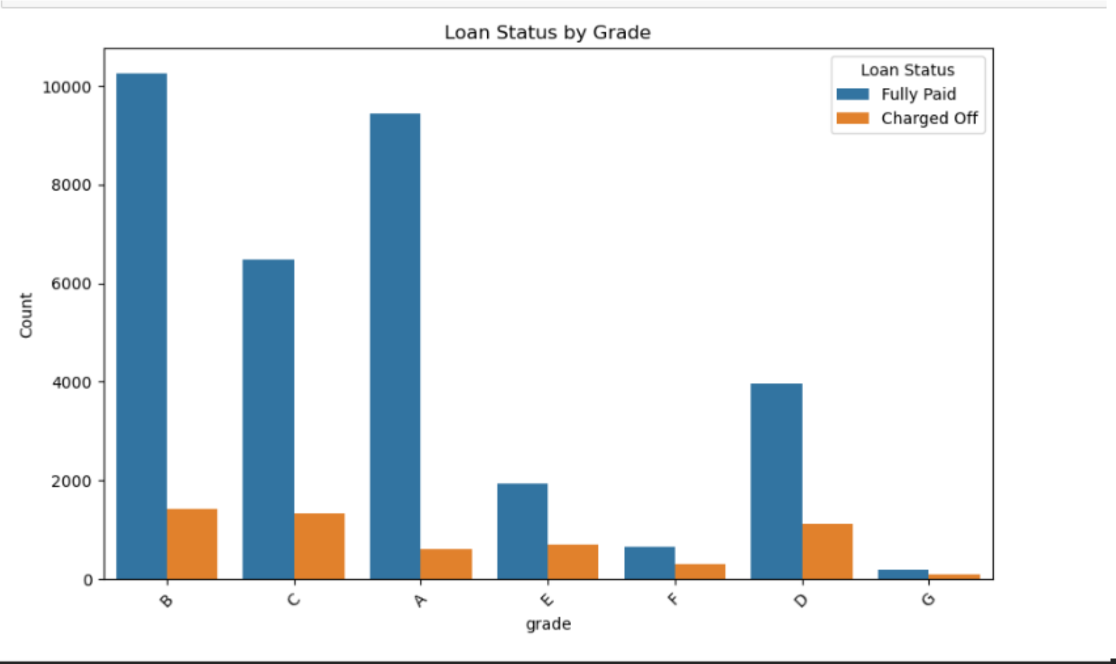


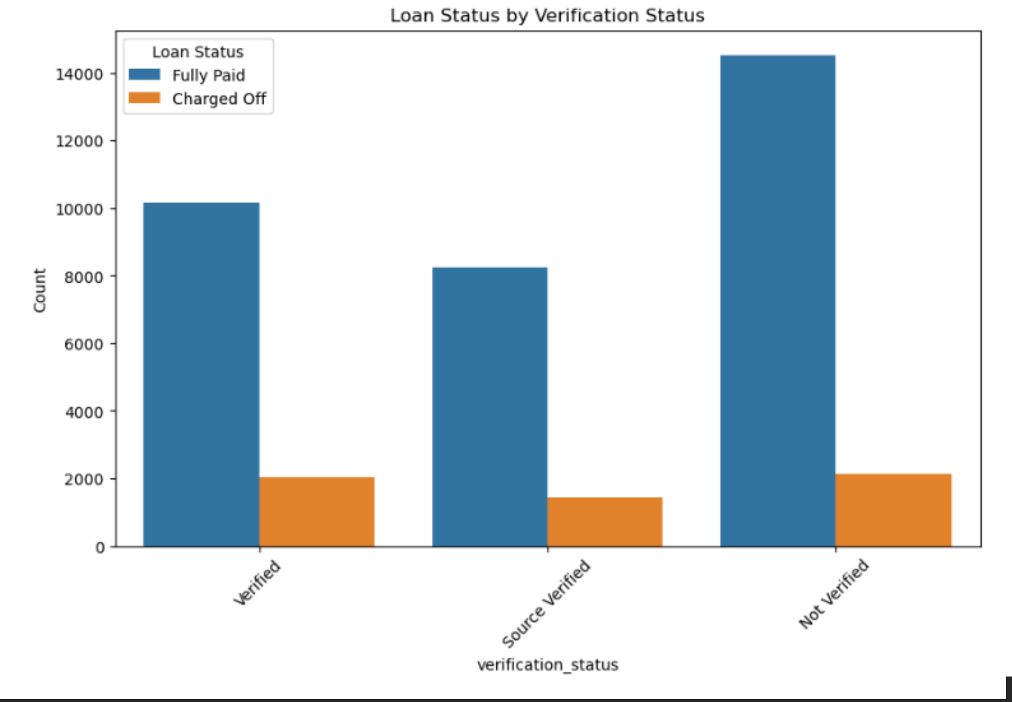


Bivariate

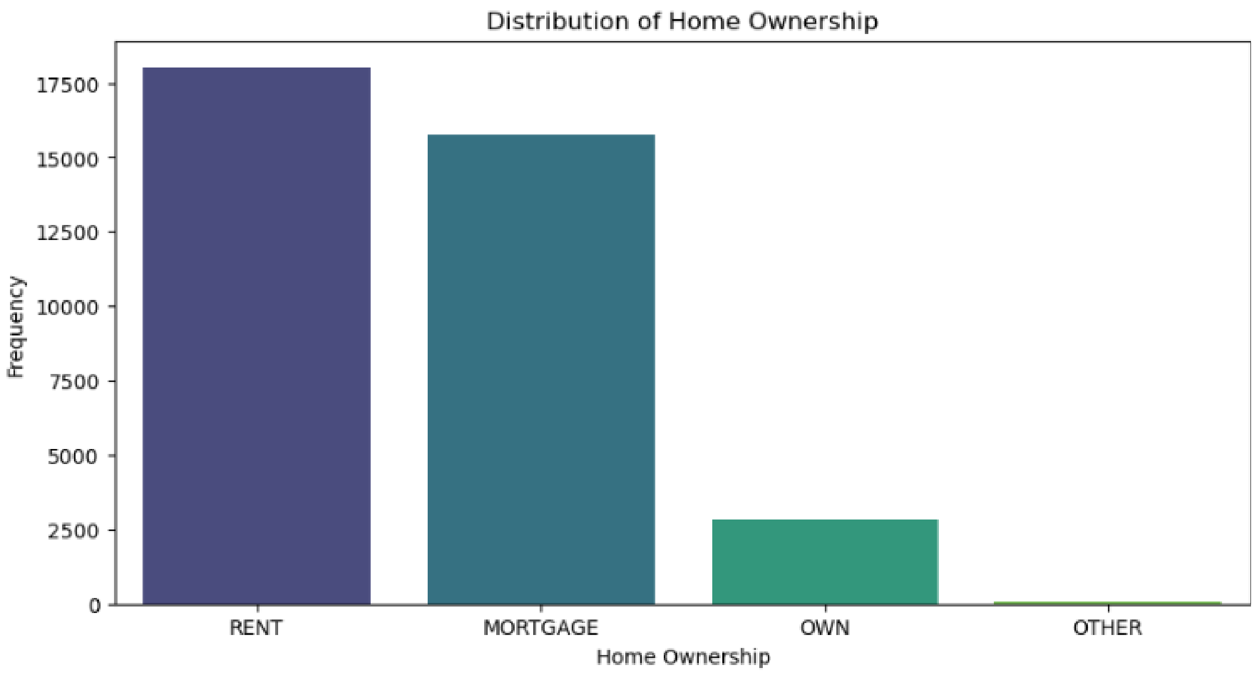
Grade:- Lower loan grades (D, E, F, G) have higher default rates compared to higher grades (A, B, C).

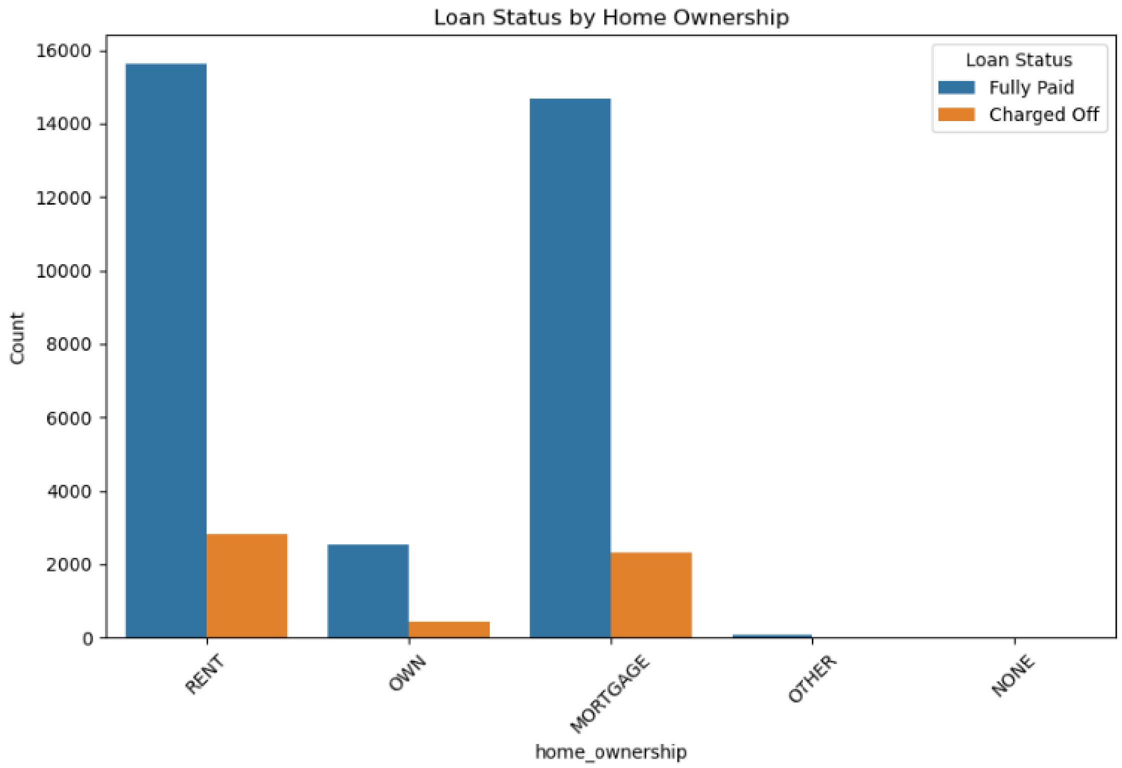
Status – Loans with unverified income have a higher default rate.





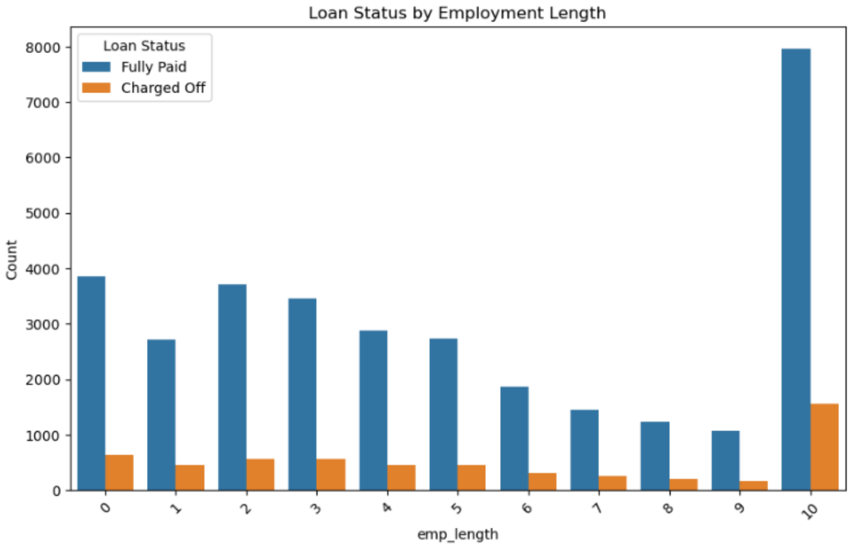
Home Ownership :- Most borrowers are either renting or have mortgages cause for defaulting the Loan

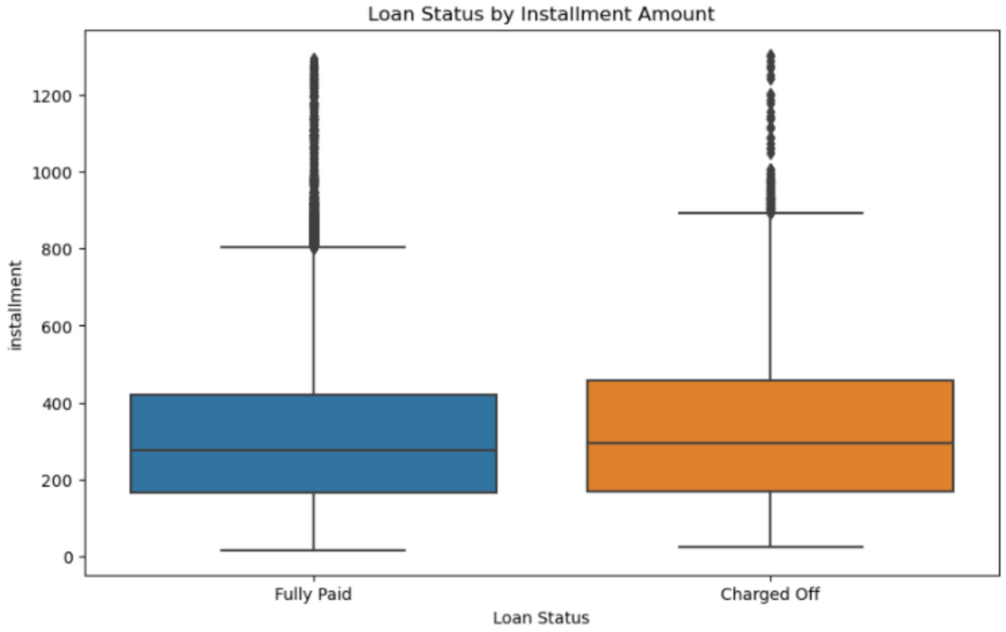




Employee length :- Borrowers with high employment lengths have a higher rate of defaults

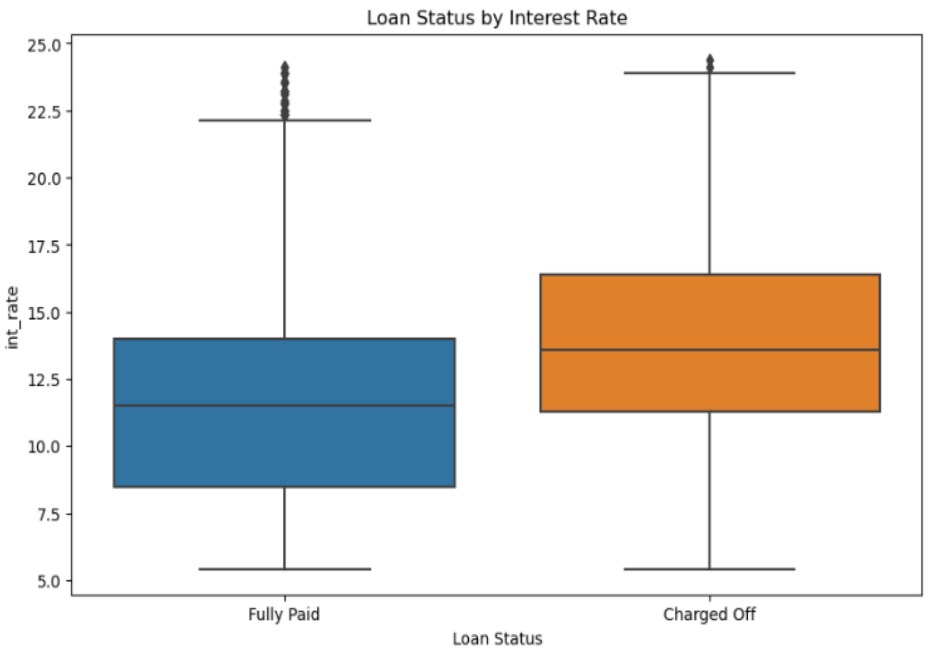
Installment :- Higher monthly installments are associated with a higher default rate

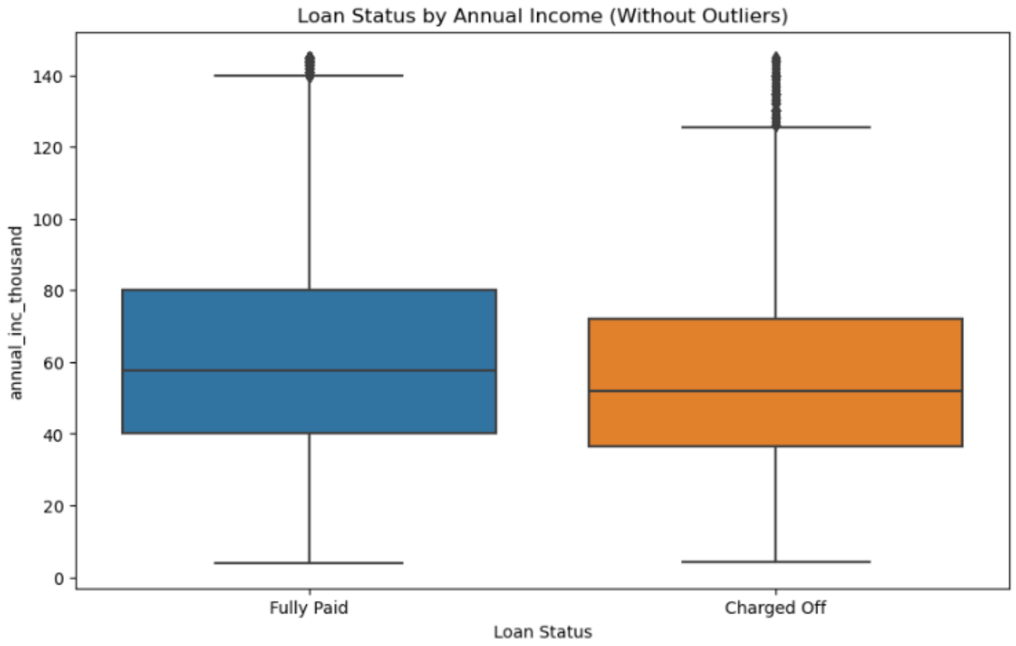




Interest :- Higher interest rates correlate with a higher proportion of charged-off loans.

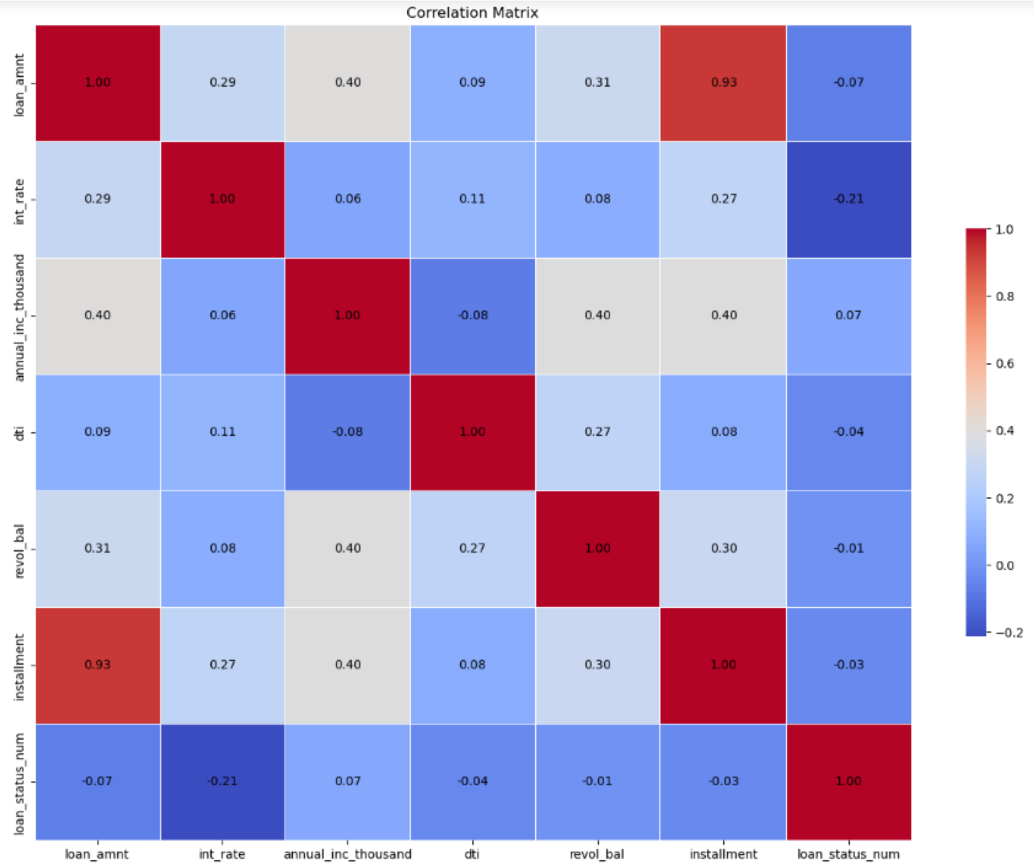
Annual income :- Lower annual incomes tend to default more frequently.





Correlation Matrix

The interest rate shows the most significant correlation implying that loans with higher interest rates are slightly more likely to default.



Recommendation & Conclusion :-

- Higher monthly installments are associated with a higher default rate.
- Higher DTI ratios are associated with a higher default.
- The lower annual incomes tend to default more frequently.
- Higher interest rates correlate with a higher proportion of charged-off loans
- Larger loan amounts show a higher tendency towards being charged-off.
- Borrowers with large employment lengths have a higher rate of defaults
- Lower loan grades have higher default rates compared to higher grades.
- Loans taken for debt consolidation have higher default rate.

- Loans with unverified income have a higher default rate than those with verified loans.
- Renters and people who have mortgages have a higher default rate compared to others.

THANK YOU