LENDING CASE STUDY

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PROBLEM STATEMENT

- You work for a consumer finance company that specializes in lending various types of loans to urban customers. The company faces two primary risks when evaluating loan applications:
  - **Risk 1**: Not approving a loan for applicants likely to repay can result in a loss of business.
  - **Risk 2**: Approving loans for applicants likely to default may lead to financial loss.
- **Objective**:
  The goal is to identify patterns indicating whether an applicant is likely to default, which can inform actions such as denying loans, reducing loan amounts, or lending at higher interest rates to riskier applicants.

DATA UNDERSTANDING

The dataset consists of information from past loan applicants, including their profile, loan details, and repayment status. The primary variable of interest is whether the applicant has defaulted on the loan.

We will be filtering the data for loan_status: Charged_off to analyse the behaviour of individuals who have historically defaulted.

Loan Details:

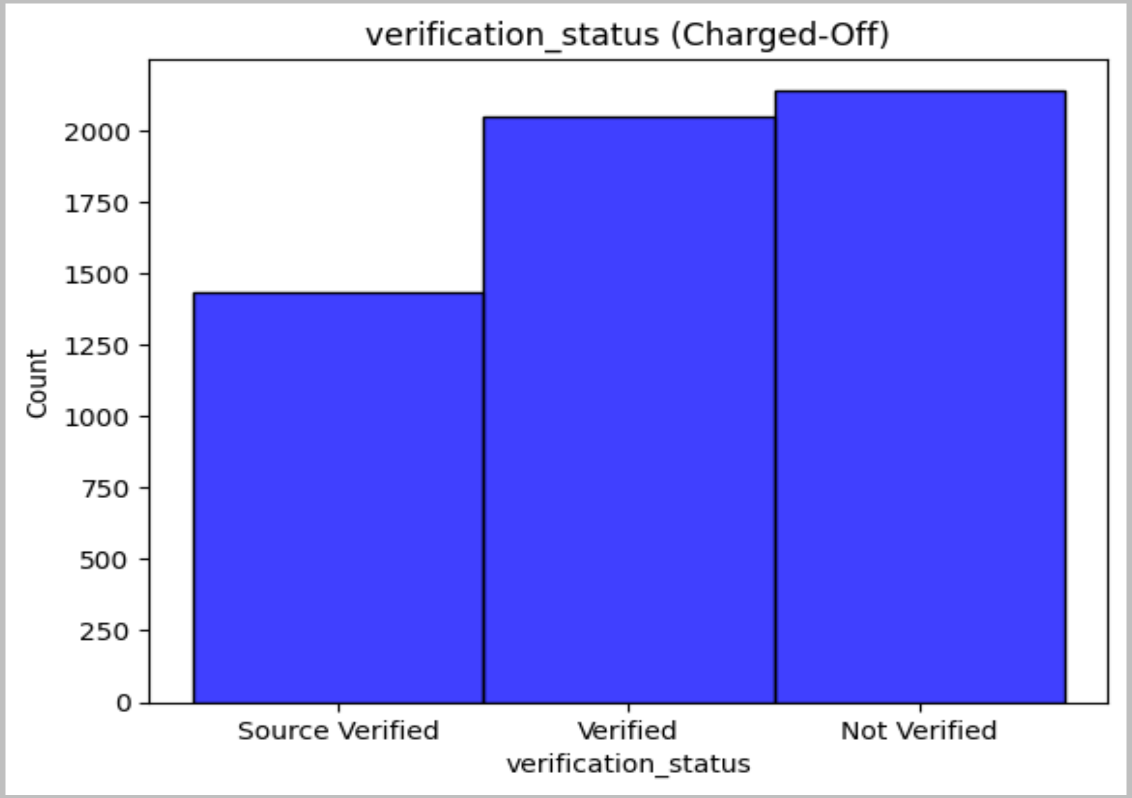
1. Loan_amt
2. Term
3. Int_rate
4. loan_status

Applicant Information:

1. home_ownership
2. Dti
3. verification_status
4. grade

VERIFICATION STATUS

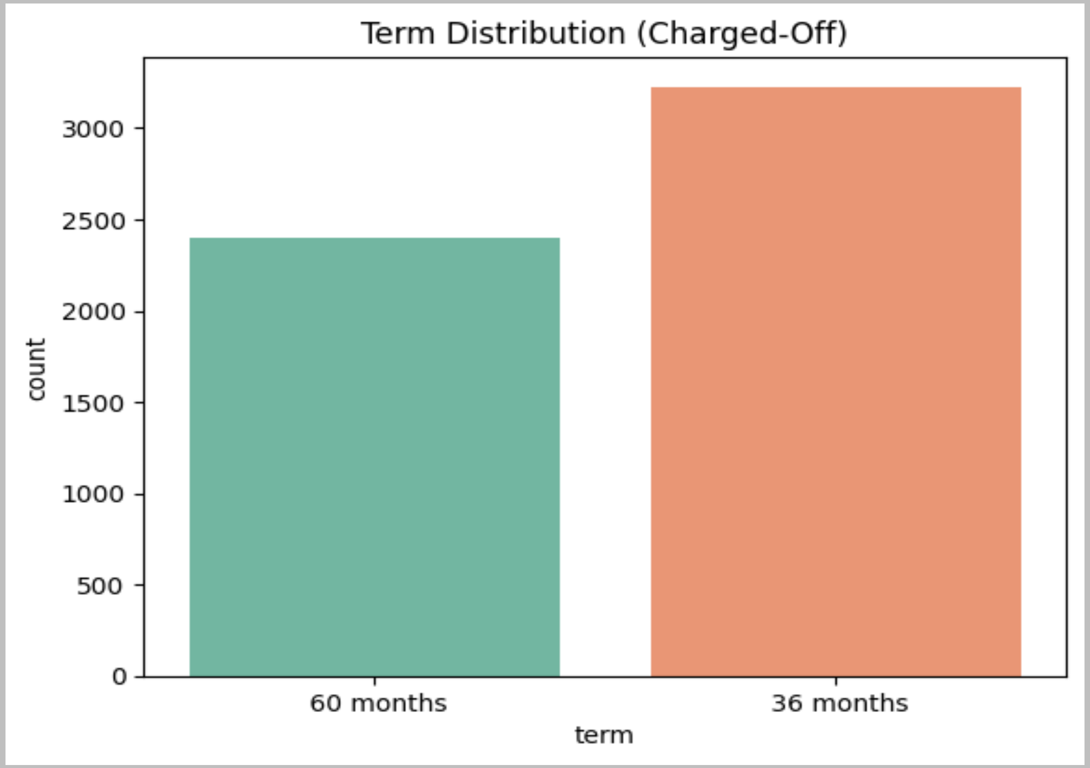
Source-verified applicants are less likely to default as their income and financial details are confirmed by external sources, ensuring they have a stable income and lower financial risk. This insight helps in identifying a lower-risk group for loan approvals, reducing the likelihood of defaults and financial losses for the company



TERM DISTRIBUTION

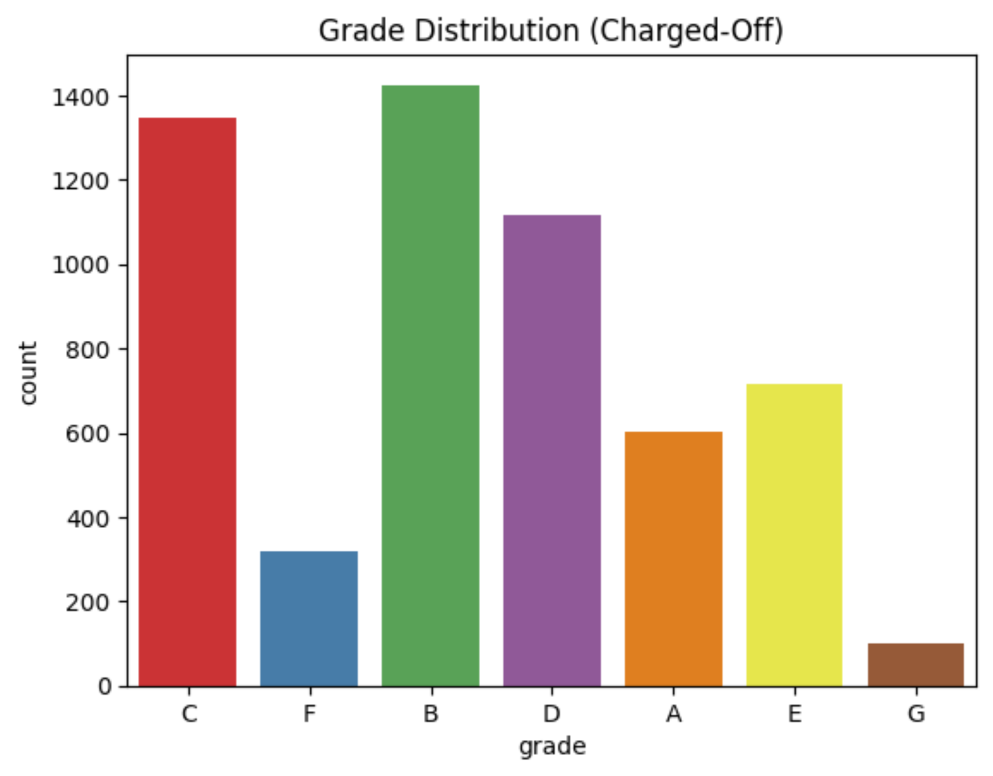
Applicants with a 36-month term may default more due to higher monthly payments compared to a 60-month term, which could strain their finances. This insight helps the company consider offering longer-term loans to reduce default risk by lowering monthly payment burdens.

By adjusting loan terms to better match the applicant's repayment capacity, the company can mitigate financial strain on borrowers, leading to fewer defaults and improved loan performance.



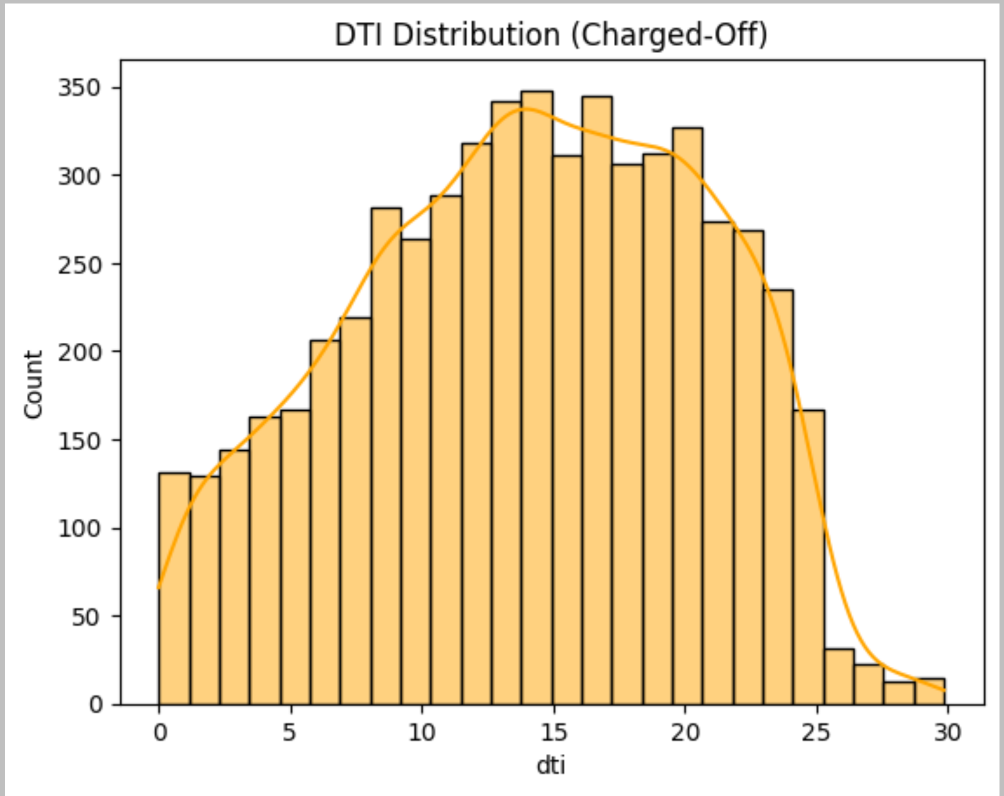
GRADE

Individuals with B & C grades likely default more because these grades indicate moderate credit risk—neither the highest nor lowest risk category—leading to less favorable loan terms such as higher interest rates, which can increase repayment difficulties. This insight helps the company focus on tighter lending criteria or offer adjusted loan terms for these mid-tier risk borrowers, thereby reducing defaults and potential losses.



DTI

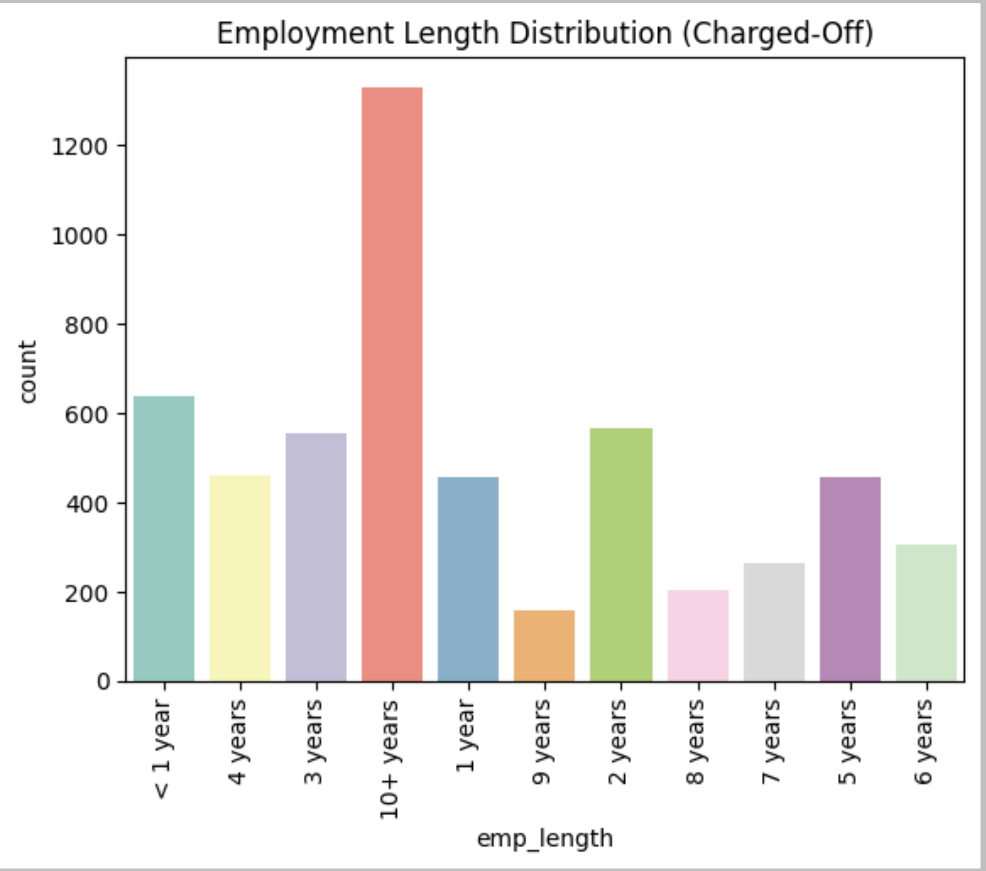
The concentration of defaults in the 10–20 DTI (Debt-to-Income) range suggests that borrowers with moderate debt burdens relative to their income may struggle to manage additional loan payments. This range indicates that while these individuals are not over-leveraged, they may lack the financial flexibility to handle unexpected expenses or financial setbacks. Identifying this pattern allows the company to consider stricter lending criteria or additional financial checks for applicants in this DTI range to reduce default risks and improve loan performance.



EMPLOYMENT LENGTH

Clearly borrowers with 10 or more years of employment have defaulted the most. Long-term employed individuals might have been approved for larger loans or higher credit limits because they appear to have greater financial stability.

However, larger loans come with higher installment payments, and despite their steady employment, they may have been unable to manage these larger payments, leading to defaults



HOME OWNERSHIP

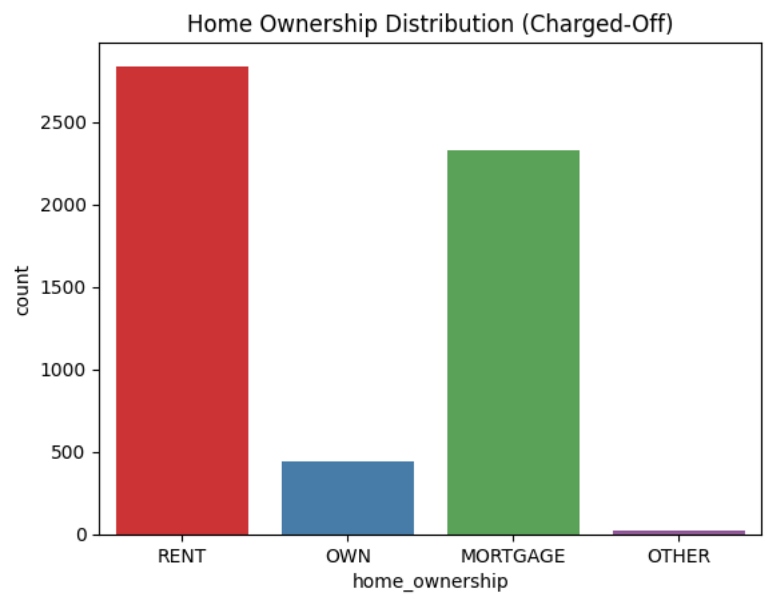
Renters might generally have **less financial stability** than those who own homes or have a mortgage. Homeownership often requires a certain level of financial responsibility, which may indicate stronger financial discipline or resources.

In contrast, renters might have:

Lower savings.

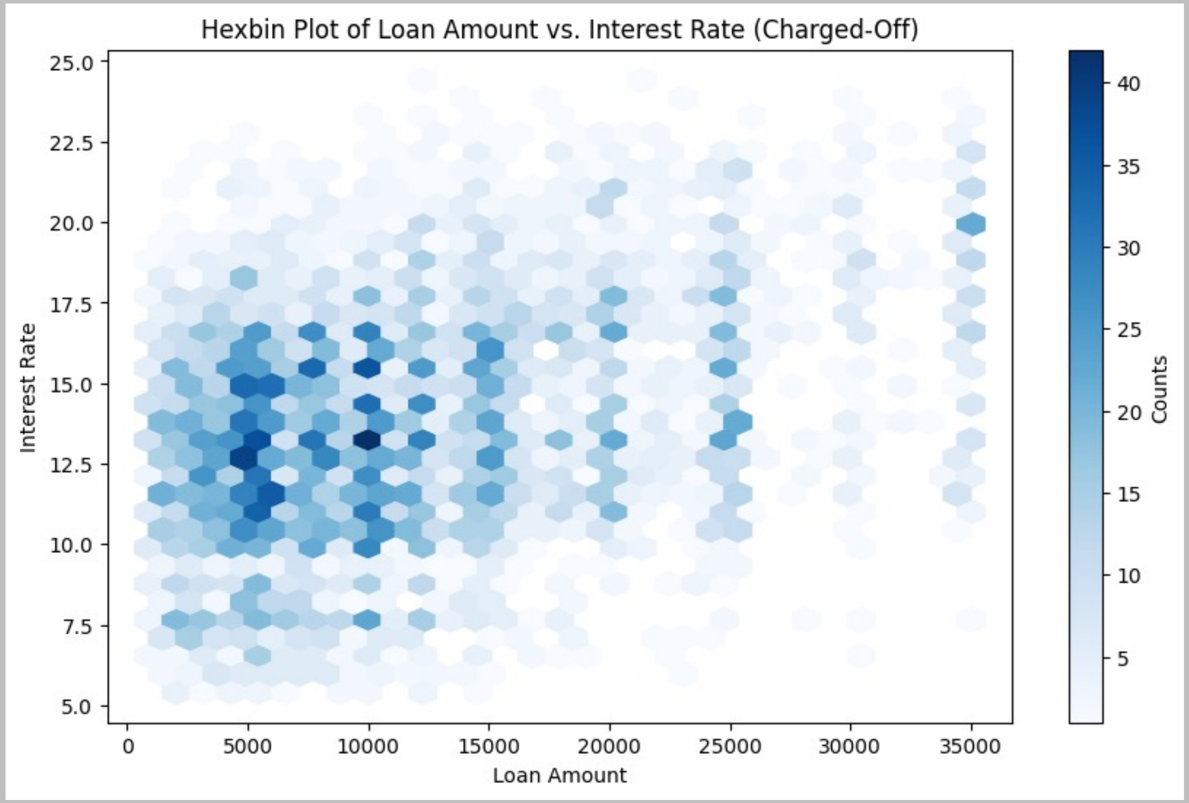
Less disposable income.

Less consistent employment or income stability.



INTEREST RATE V/S LOAN AMOUNT

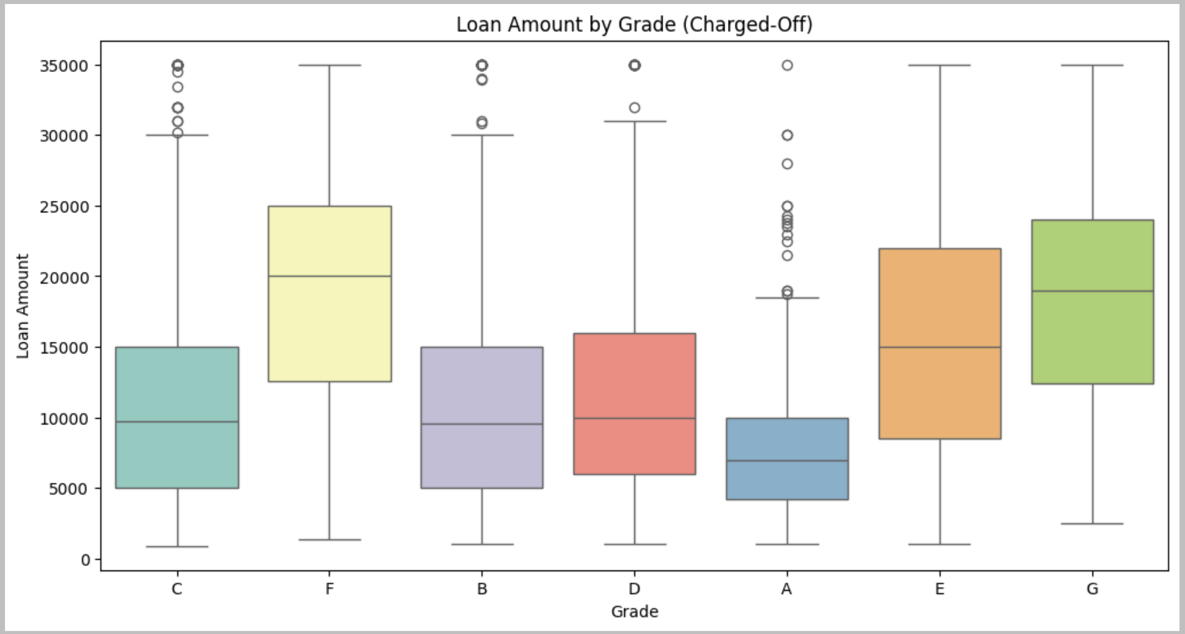
This simply shows that amount 5,000 at 13% interest is a popular loan combination



LOAN AMOUNT V/S GRADE

Higher grades (e.g., A, B) have smaller loan amounts compared to lower grades (e.g., F, G)

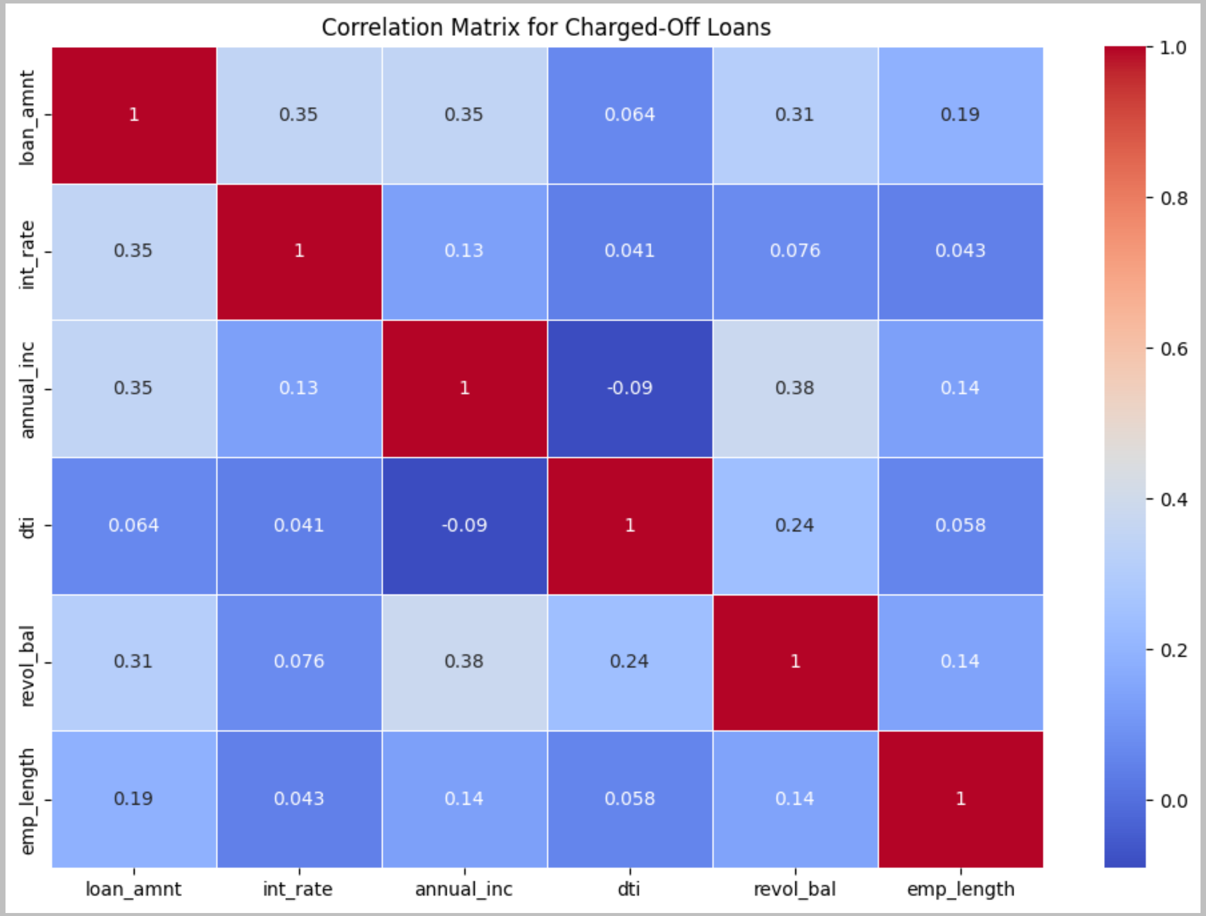
This suggests that more creditworthy borrowers tend to take out smaller loans, whereas riskier borrowers take larger loans.



CORRELATION

A 0.38 correlation indicates that as annual income increases, the revolving balance (the amount owed on revolving credit accounts, such as credit cards) also tends to increase.

This relationship can signify that higher-income individuals might use more credit, either because they have higher spending power or because they might rely more heavily on credit to manage their cash flow.



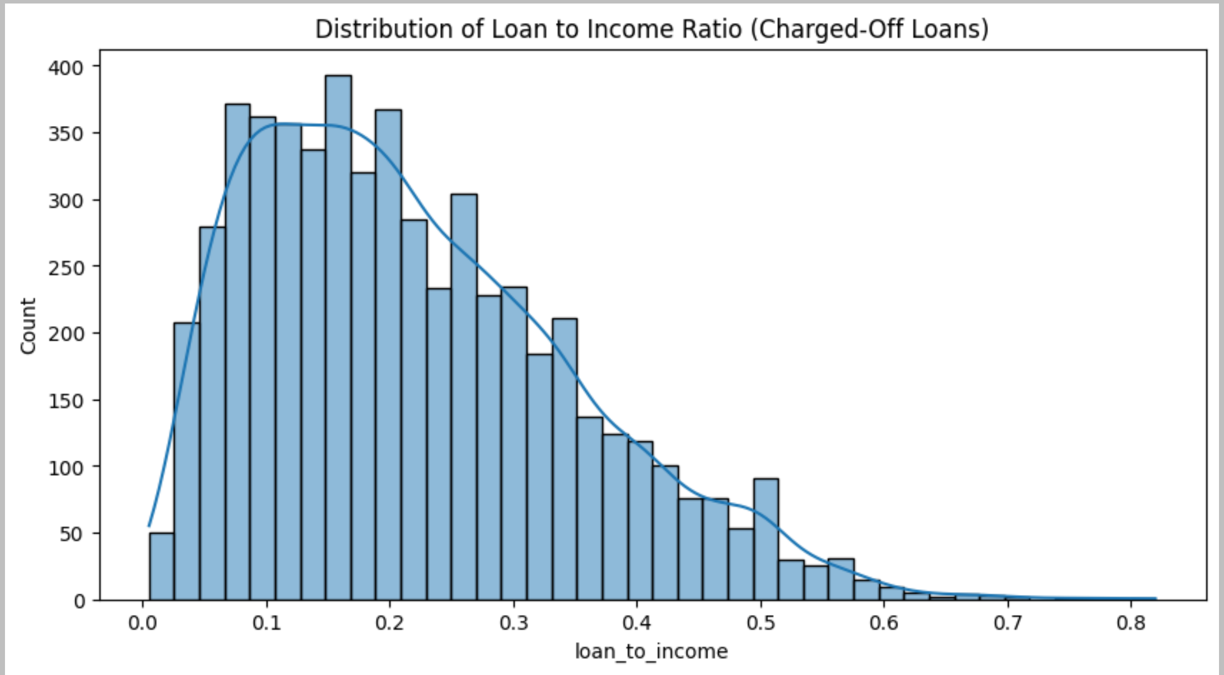
FEATURE ENGINEERING: LOAN-TO-INCOME RATIO

Maximum number of defaults at a loan-to-income (LTI) ratio of 0.15

An LTI ratio of 0.15 implies that borrowers are taking on loans that constitute 15% of their income.

Borrowers at this ratio are at a critical affordability threshold where loans become challenging to manage.

Borrowers may be over-leveraging themselves relative to their income.



THANK YOU