LENDING CLUB CASE STUDY

- MR. OMKAR AMALE

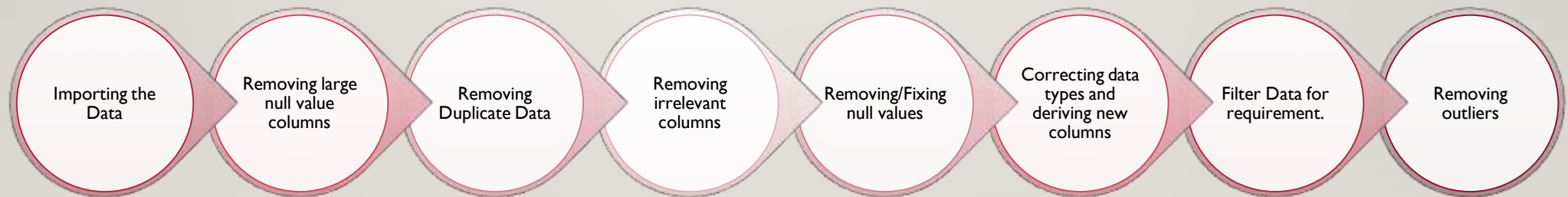- AS PART OF IIT-B AI & ML COURSE SUBMISSION

OBJECTIVE

- The goal of this case study is to apply Exploratory Data Analysis (EDA) to a real-world scenario, extracting valuable insights and presenting them from a business perspective through a comprehensive presentation.
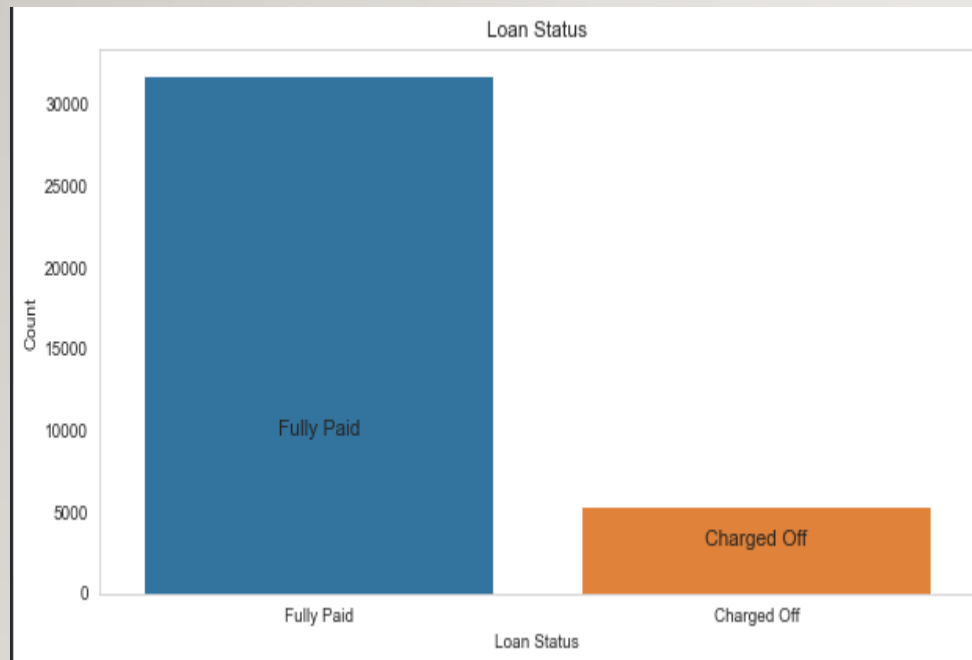
Key Benefits:

- Offers practical experience in using EDA to tackle real-world business challenges.

- Provides foundational knowledge of risk analysis within banking and financial services.

- Demonstrates how data can be leveraged to reduce financial risk in client lending.

- Enhances skills in data visualization, including selecting appropriate charts for practical data applications.

BUSINESS UNDERSTANDING

- The business objective is to decide whether to approve or reject each loan application based on specific factors.

- The dataset includes information on previous loan applicants and indicates whether they "defaulted" or not. It contains data on approved loans only, with three loan statuses: Fully Paid, Current, and Charged-Off.

Importing the Data → Removing large null value columns → Removing Duplicate Data → Removing irrelevant columns → Removing/Fixing null values → Correcting data types and deriving new columns → Filter Data for requirement. → Removing outliers

LOAN STATUS – OVERALL

- **Loan Status:** The number of charged off loan is 14.5%.

UNI-VARIATE ANALYSIS OBSERVATIONS AS BELOW

Key Insights on "Charged-Off" Loans with Higher Default Risk

- **Applicant Type**: Renters have a higher likelihood of defaulting.

- **Loan Purpose**: Loans taken for debt consolidation show a greater risk of default.

- **Verification Status**: Applications marked as "Not Verified" are more likely to default.

- **Loan Term**: Terms exceeding 36 months are associated with higher default rates.

- **Funding Range**: Funded amounts between $5,000 and $10,000 are at higher risk.

- **Loan Amount**: Loans within the $5,000 to $10,000 range have higher chances of default.

- **Installment Range**: Monthly installments between $145 and $274 show increased default risk.

- **Debt-to-Income (DTI) Ratio**: Ratios between 12% and 18% are linked to higher defaults.

Additional Observations

- **Seasonal Trends**: December shows a spike in defaults for disbursed loans.

- **Economic Impact**: Financial crises, such as in 2011, correlate with increased charged-off loans.

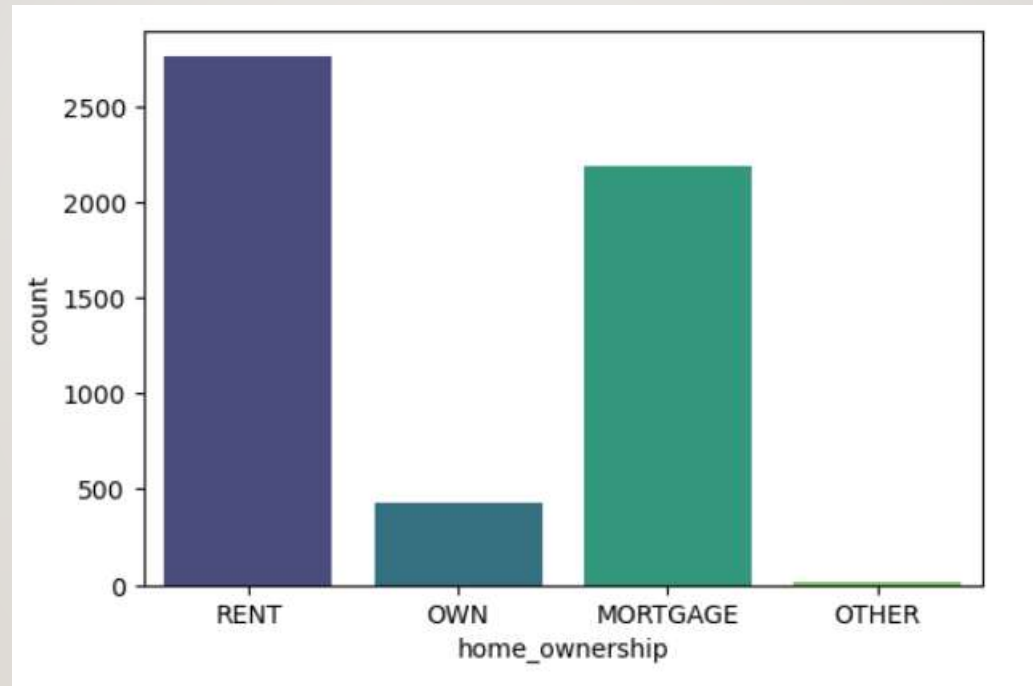# BI-VARIATE ANALYSIS OBSERVATIONS AS BELOW

Based on Bi-Variate Analysis of "Charged-Off" Loans, the Following Applicant Categories Show the Highest Default Risk:

• Applicants taking loans for **home improvement** with an income between **$60k - $70k**

• Applicants with **MORTGAGE** home ownership and an income between **$60k - $70k**

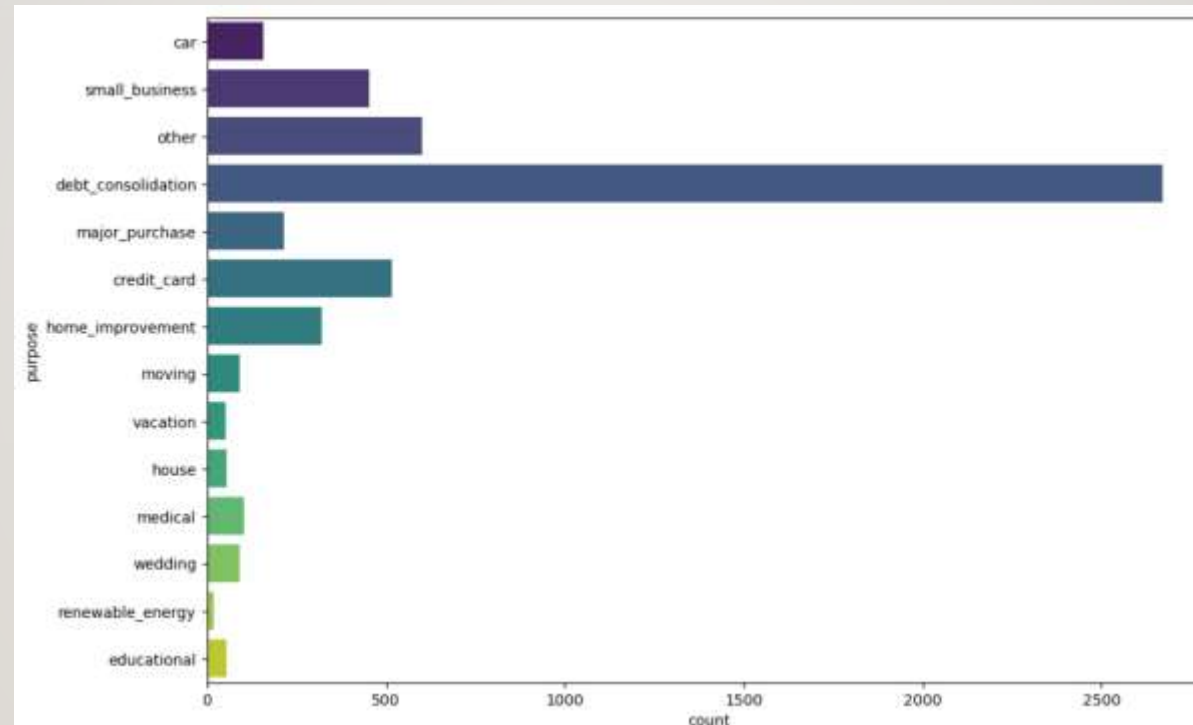• Applicants with loan amounts in the range of **$30k - $35k** who are charged an interest rate of **15% - 17.5%**
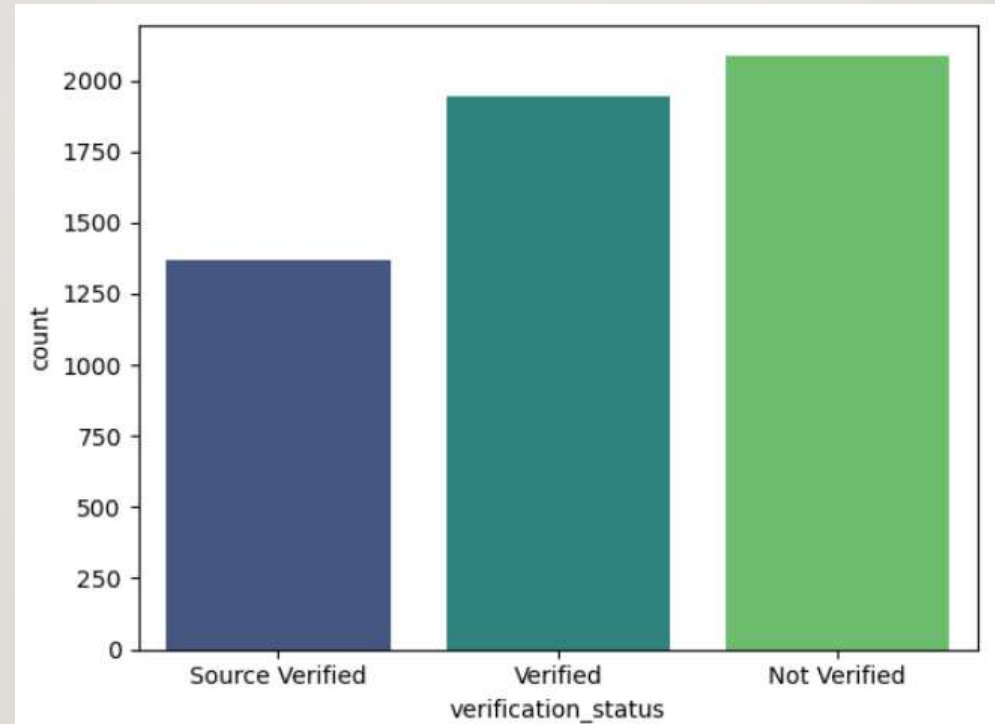
UNIVARIATE ANALYSIS

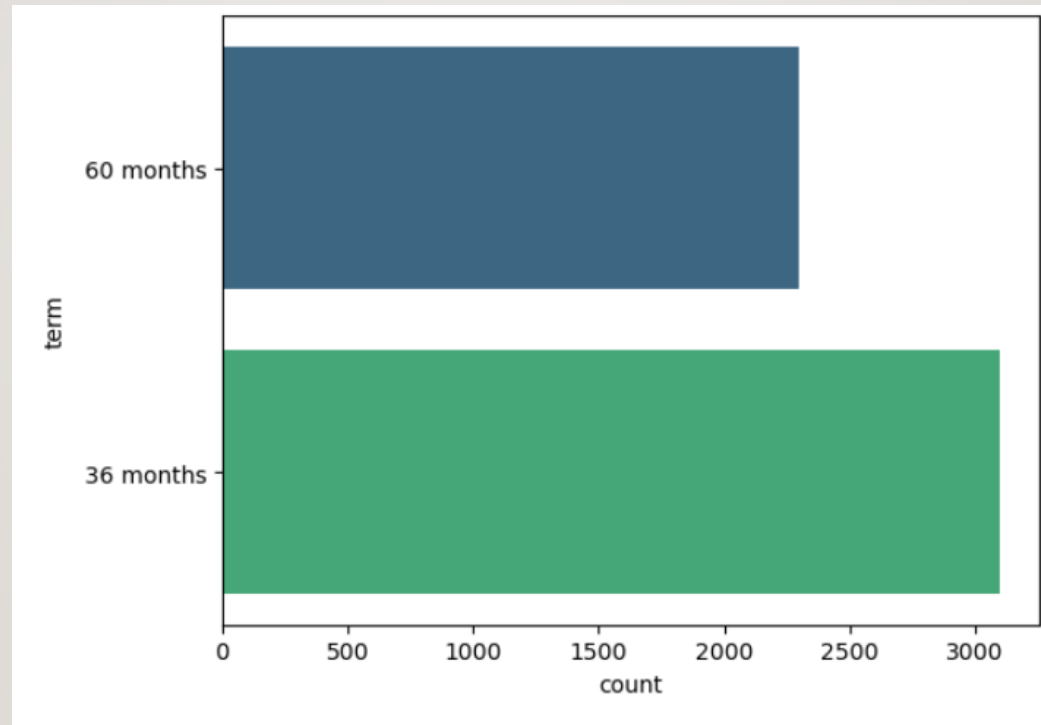# **APPLICANT TYPE**: RENTERS HAVE A HIGHER LIKELIHOOD OF DEFAULTING.

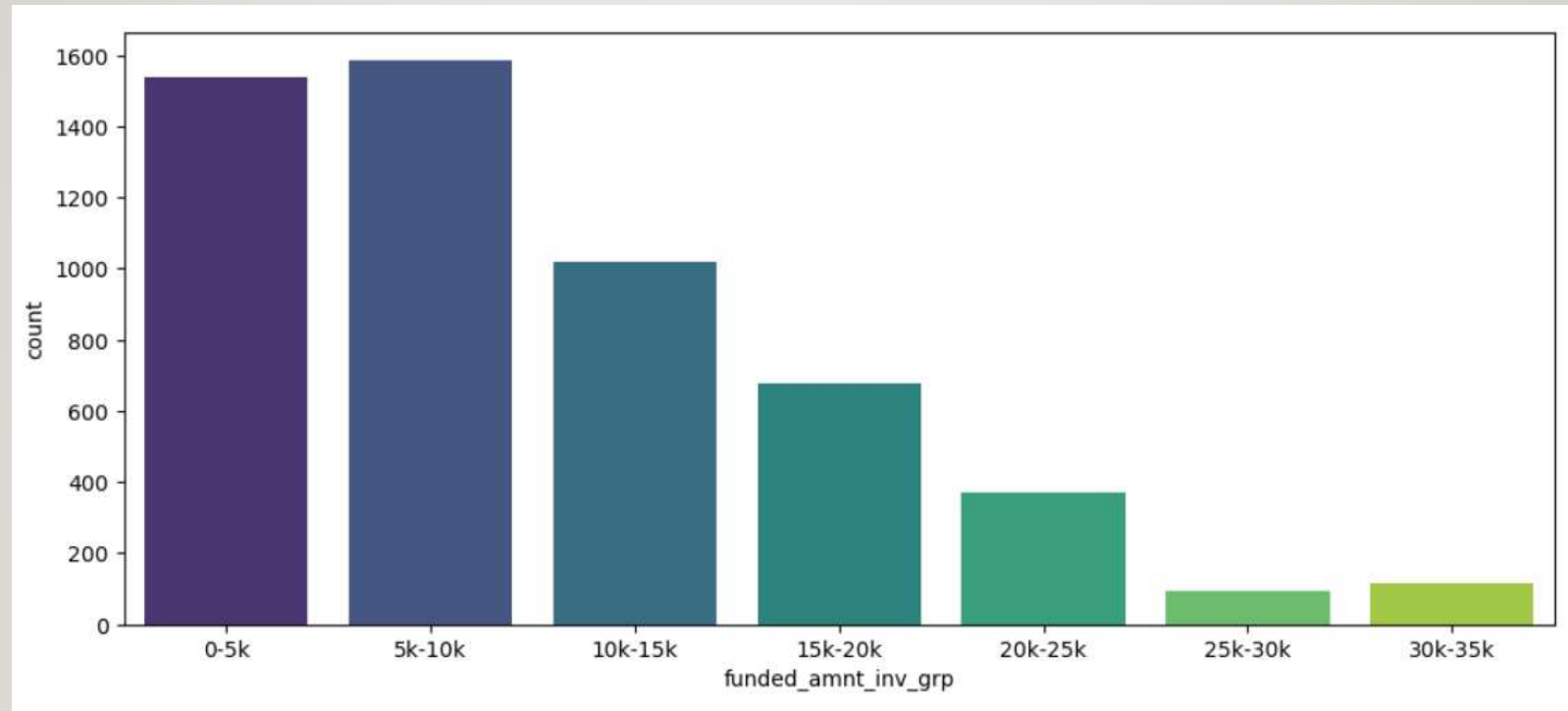# LOAN PURPOSE: LOANS TAKEN FOR DEBT CONSOLIDATION SHOW A GREATER RISK OF DEFAULT.

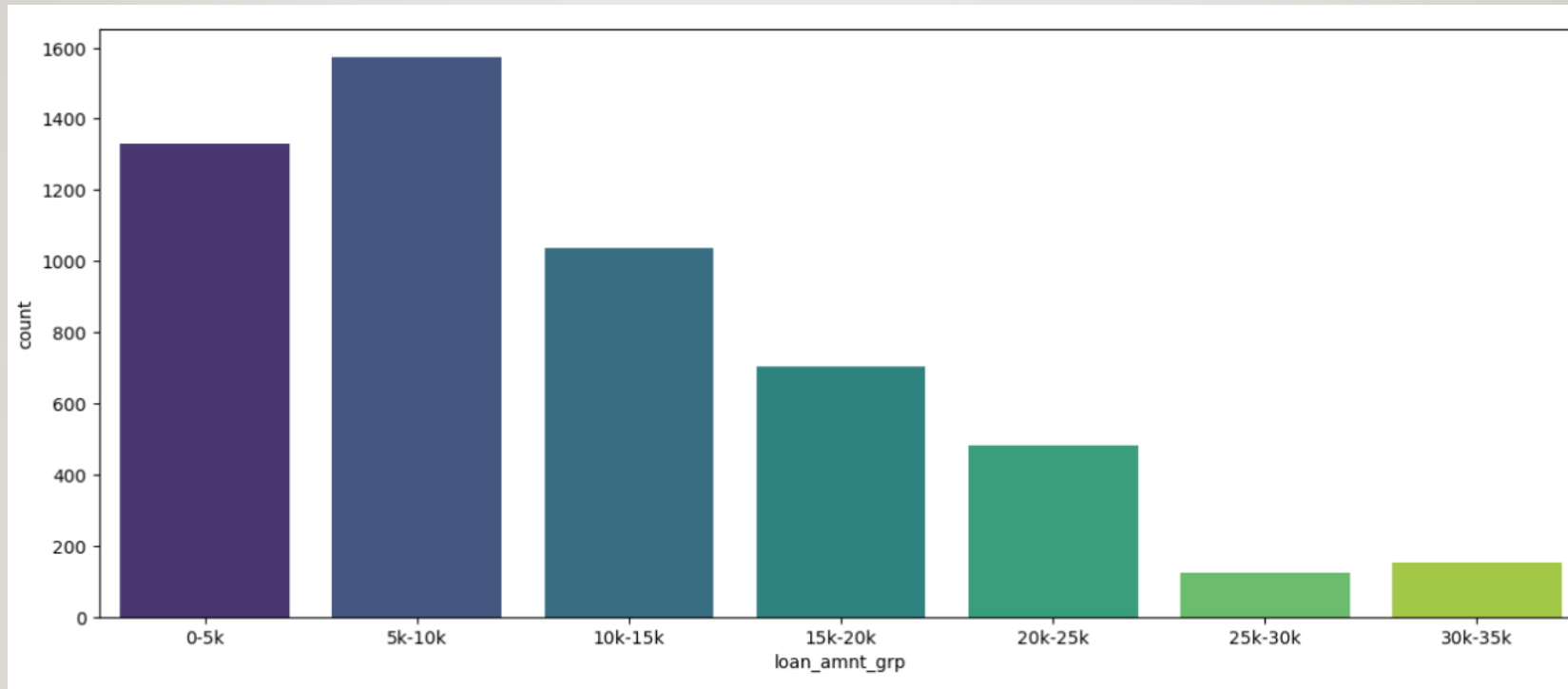# VERIFICATION STATUS: APPLICATIONS MARKED AS "NOT VERIFIED" ARE MORE LIKELY TO DEFAULT.

LOAN TERM: TERMS EXCEEDING 36 MONTHS ARE ASSOCIATED WITH HIGHER DEFAULT RATES.
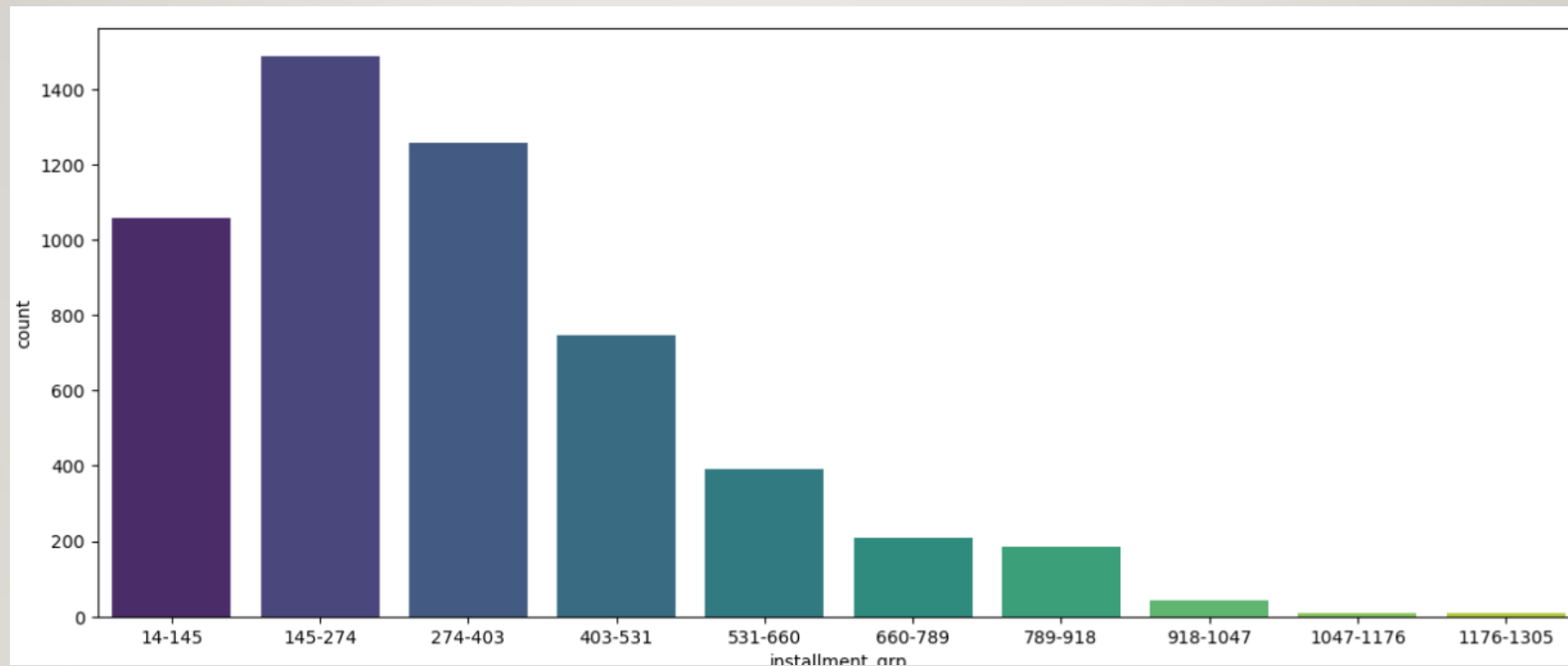
FUNDING RANGE: FUNDED AMOUNTS BETWEEN $5,000 AND $10,000 ARE AT HIGHER RISK.
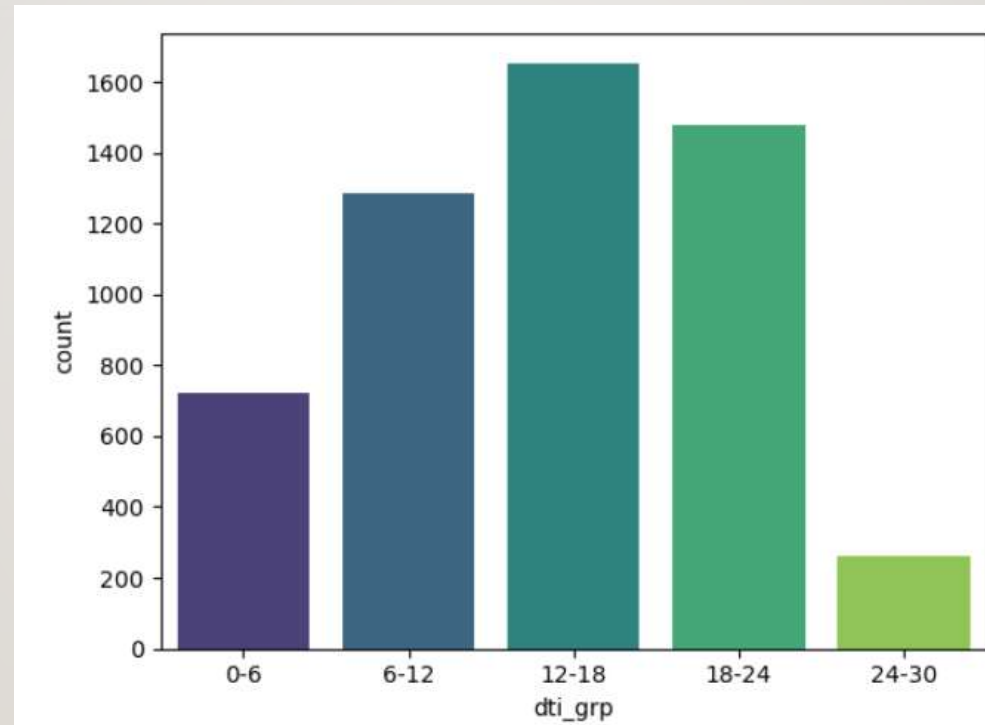
LOAN AMOUNT: LOANS WITHIN THE $5,000 TO $10,000 RANGE HAVE HIGHER CHANCES OF DEFAULT.

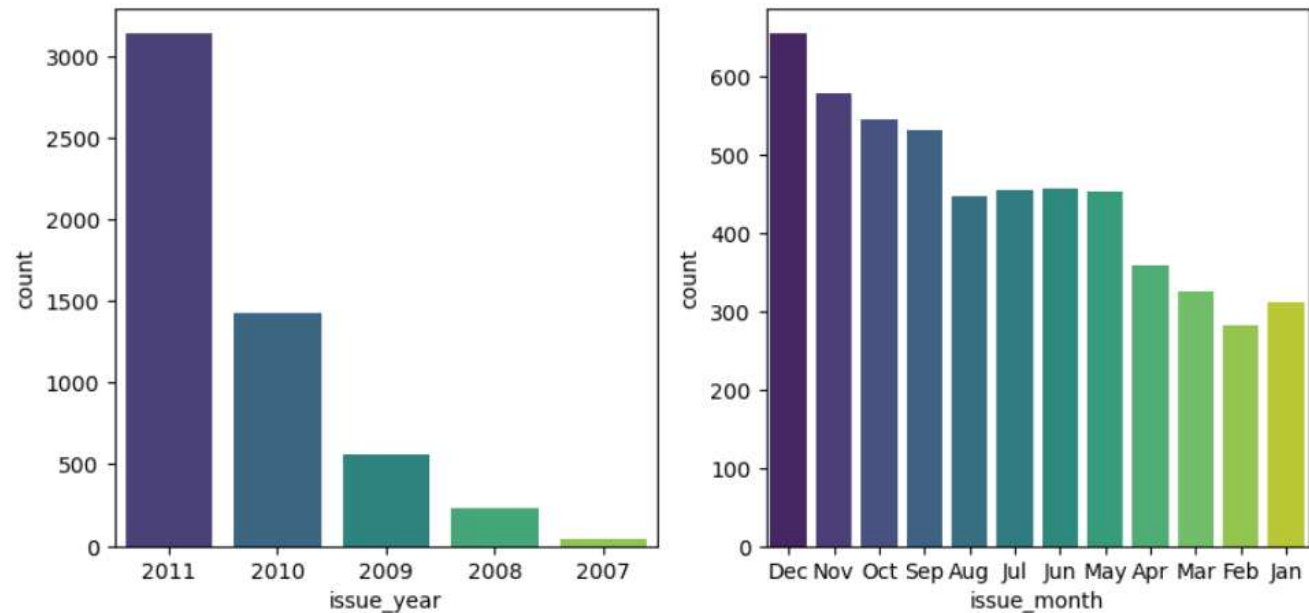# **INSTALLMENT RANGE**: MONTHLY INSTALLMENTS BETWEEN $145 AND $274 SHOW INCREASED DEFAULT RISK.

DEBT-TO-INCOME (DTI) RATIO: RATIOS BETWEEN 12% AND 18% ARE LINKED TO HIGHER DEFAULTS.

ADDITIONAL OBSERVATIONS
SEASONAL TRENDS: DECEMBER SHOWS A SPIKE IN DEFAULTS FOR DISBURSED LOANS.
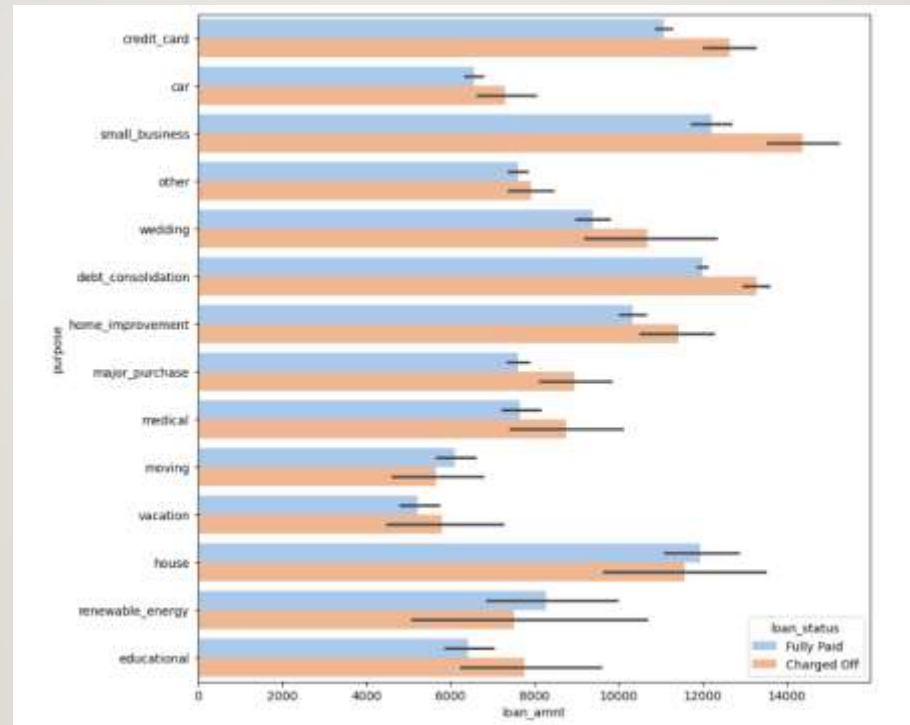**ECONOMIC IMPACT**: FINANCIAL CRISES, SUCH AS IN 2011, CORRELATE WITH INCREASED CHARGED-OFF LOANS.

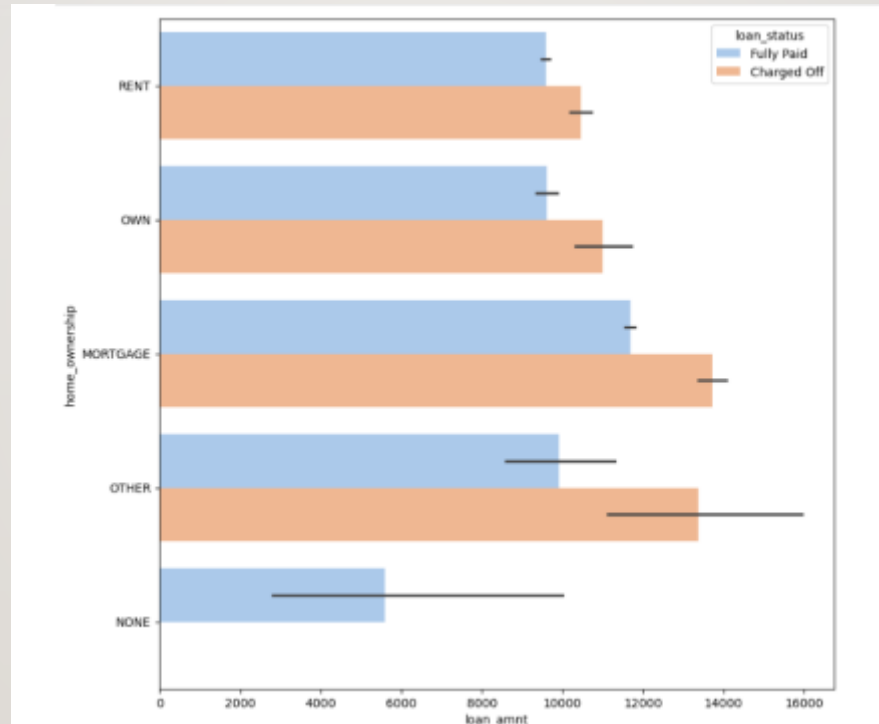**"Maximum number of Defaults occured for loan given in 2011 and in Dec Month"**

BI-VARIATE ANALYSIS

APPLICANTS TAKING LOANS FOR **HOME IMPROVEMENT** WITH AN INCOME BETWEEN **$60K - $70K**

APPLICANTS WITH **MORTGAGE** HOME OWNERSHIP AND AN INCOME BETWEEN **$60K - $70K**

APPLICANTS WITH LOAN AMOUNTS IN THE RANGE OF **$30K - $35K** WHO ARE CHARGED AN INTEREST RATE OF **15% - 17.5%**