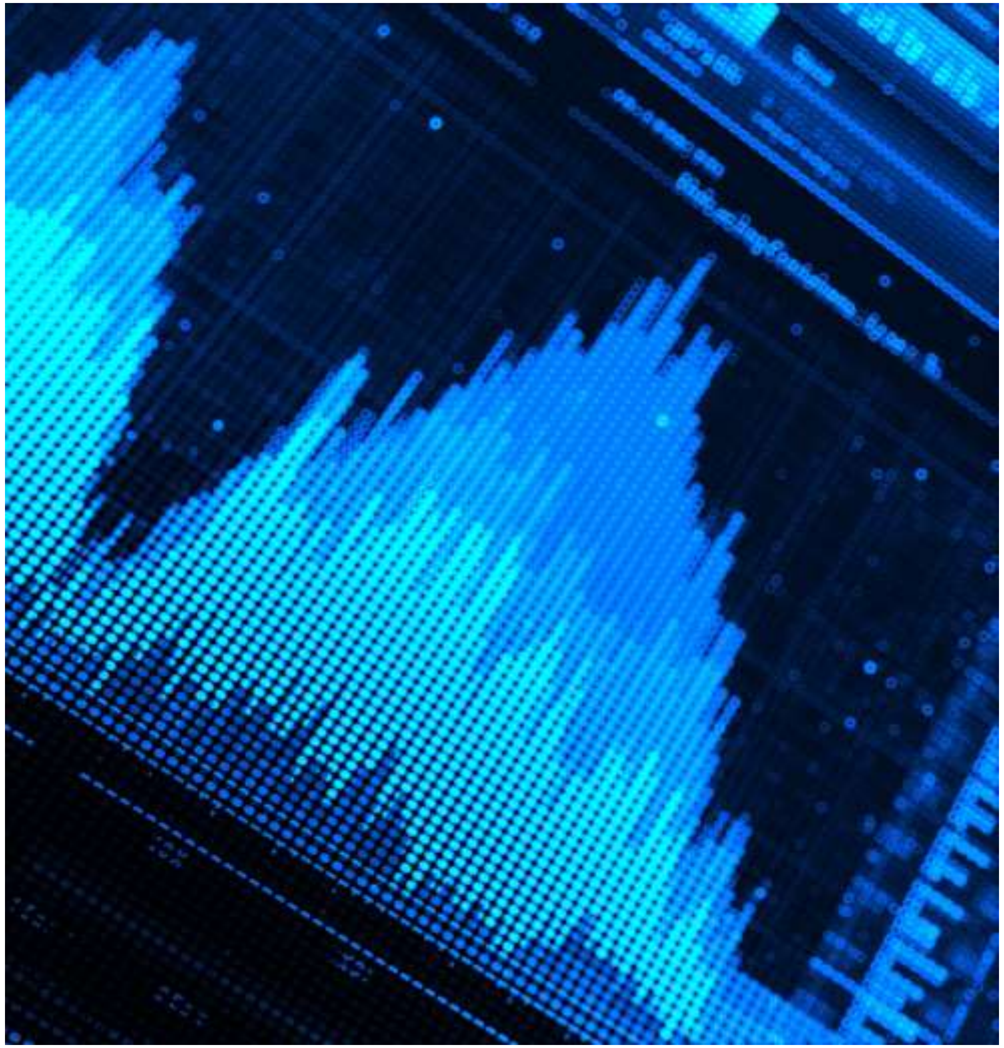
Lending Club Case Study

- Identifying Risky Borrowers to Optimize Lending Strategies

- *Akash Apoorv Yadav*
- *Anoop Oduvil*



Contents

Business Objectives & Analysis Focus

Company	The largest online loan marketplace offering personal loans, business loans, and financing for medical procedures. Borrowers benefit from easy access to lower-interest loans through a fast online interface.
Problem:	**Credit Loss**: Lending to risky applicants causes the largest financial loss (credit loss), where defaulters are customers labeled as ‘charged-off’.
Analysis Goal:	**Identify Risky Borrowers**: Use Exploratory Data Analysis (EDA) to identify patterns and driver variables that indicate the likelihood of loan default. **Business Impact:** By identifying risky applicants, the company can reduce loan amounts, deny loans, or adjust interest rates to mitigate financial loss.
Objective:	Understand the driving factors behind loan default and use this knowledge for better portfolio and risk assessment.

Analysis Approach

EDA Techniques

- **Data Cleaning & filtering:**
  - Identified key consumer and loan attributes
  - Removed insignificant columns (e.g., null and non-unique values)
  - Standardized values for easier analysis

- **Data Analysis:**
  - **Univariate Analysis:** Examined individual variable distributions.
  - **Bivariate Analysis:** Investigated relationships between variables and loan status.
  - **Segmented Analysis:** Analyzed insights across consumer demographics and loan statuses

- **Insights and Recommendations**

Tools

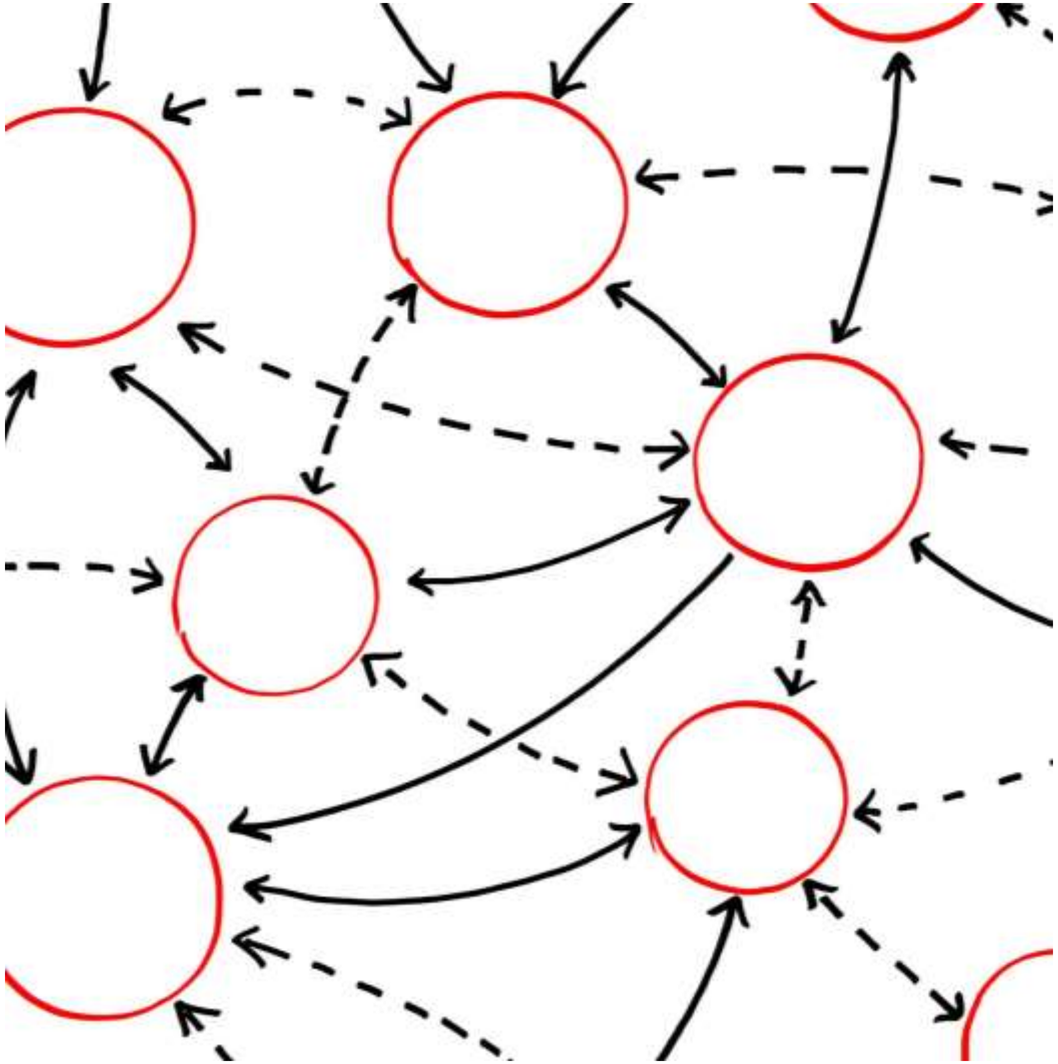
- Python: Utilizing libraries such as Pandas, Seaborn, and Matplotlib

Dataset Overview

Scope: 39,717 records and 111 variables.

Key Features:

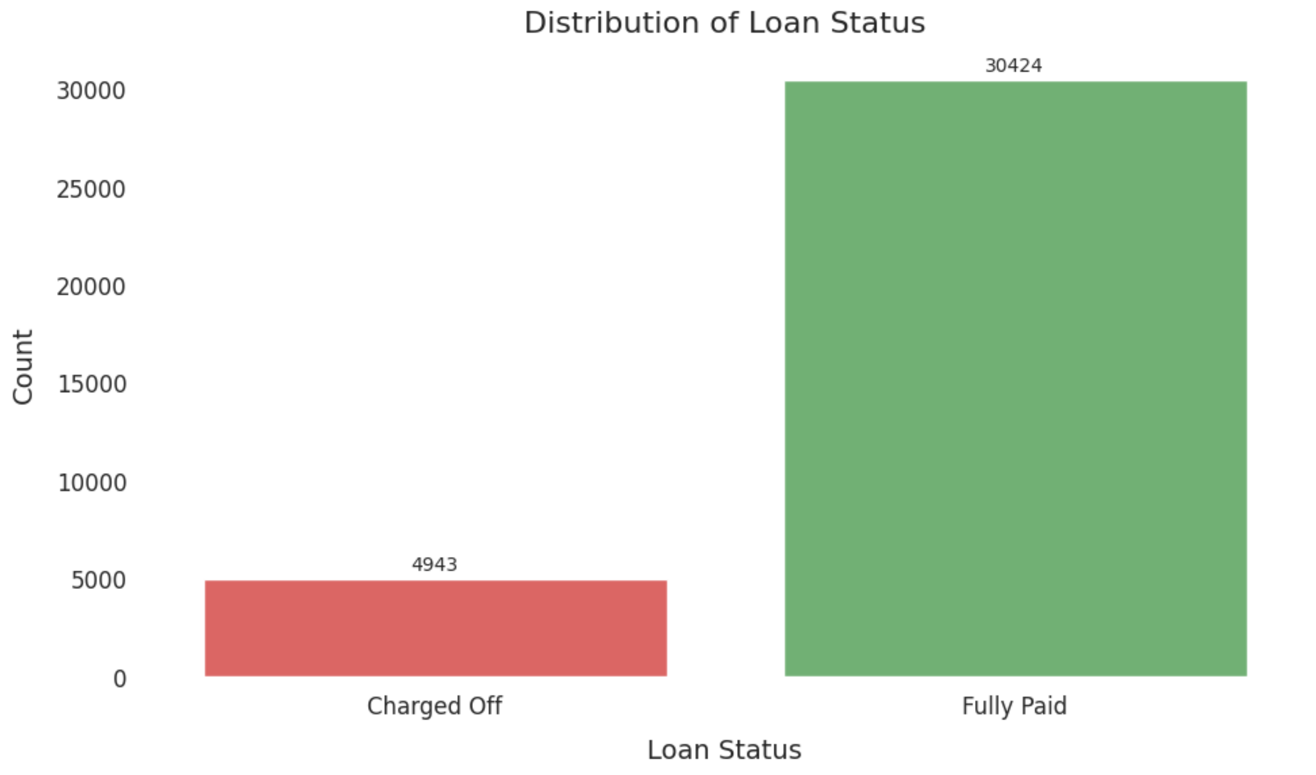
- **Consumer Attributes**: home ownership, annual income, employment duration etc
- **Loan Attributes:** Loan Amount, Term, Interest rate, Purpose of the loan etc**.**
- **Target Variable:** Loan Status (Charged off vs fully paid)



Big Picture: How Loans Are Performing

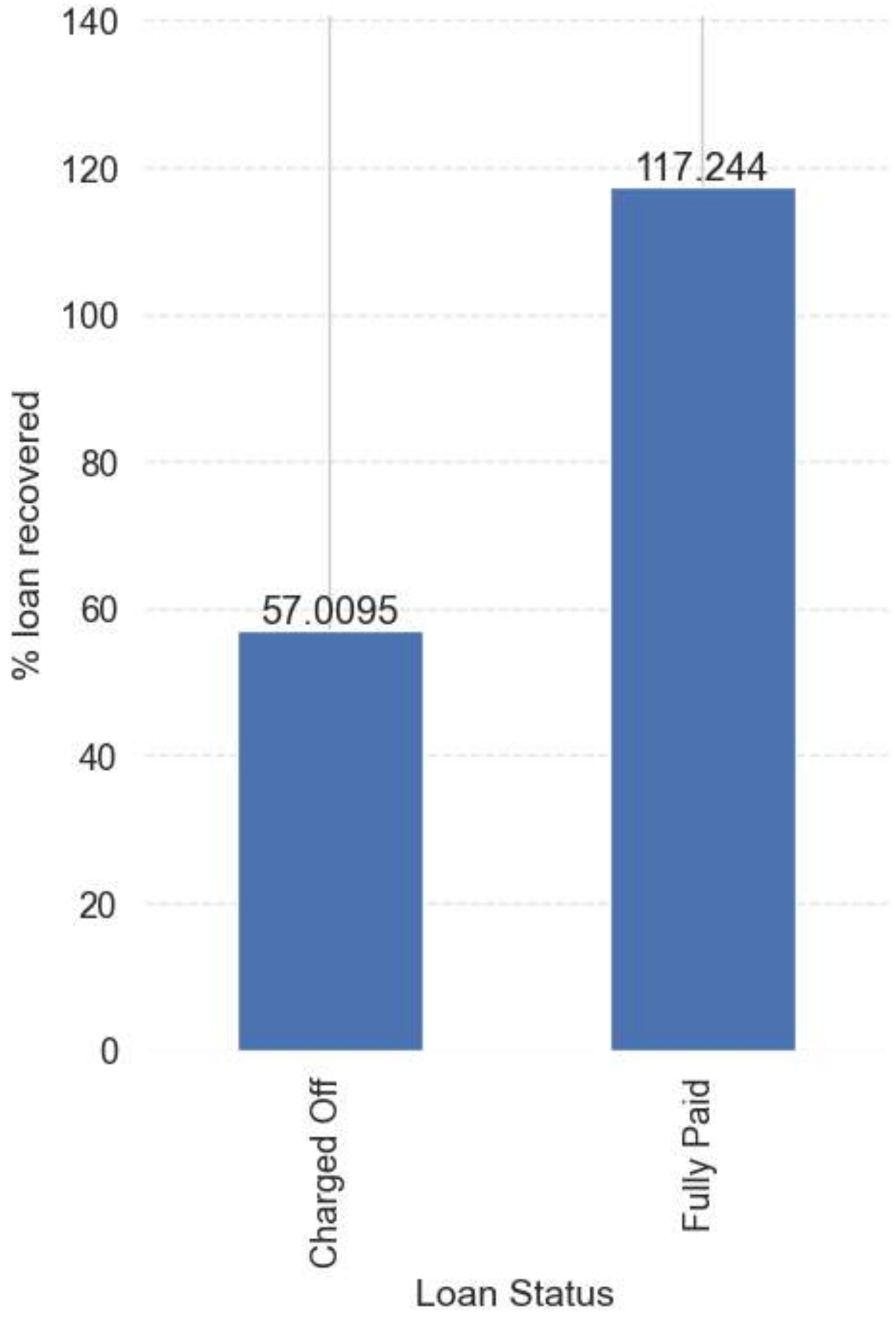
About 13.98% of the total loans are defaulted or charged-off on average.

To pinpoint key risk factors, we'll focus on categories where the default rate goes over 20%. In particular, we'll take a closer look at variables that lead to a 16.78% or higher jump in the proportion of charged-off loans.



Big Picture: Loan Recovery

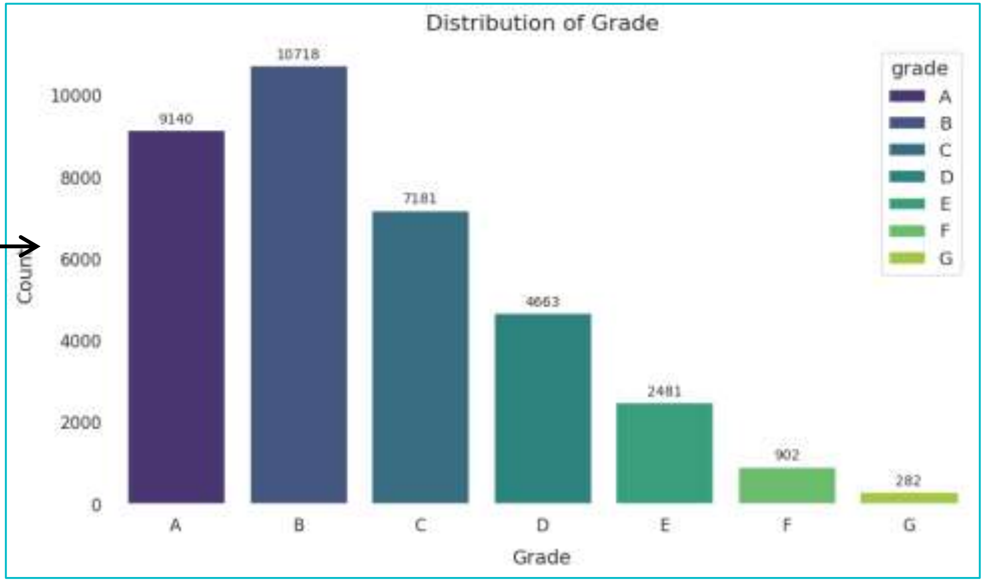
Lending Club is only able to **recover 57%** of all charged off loans, and from fully paid loans it is able to make a profit of **only 17%**

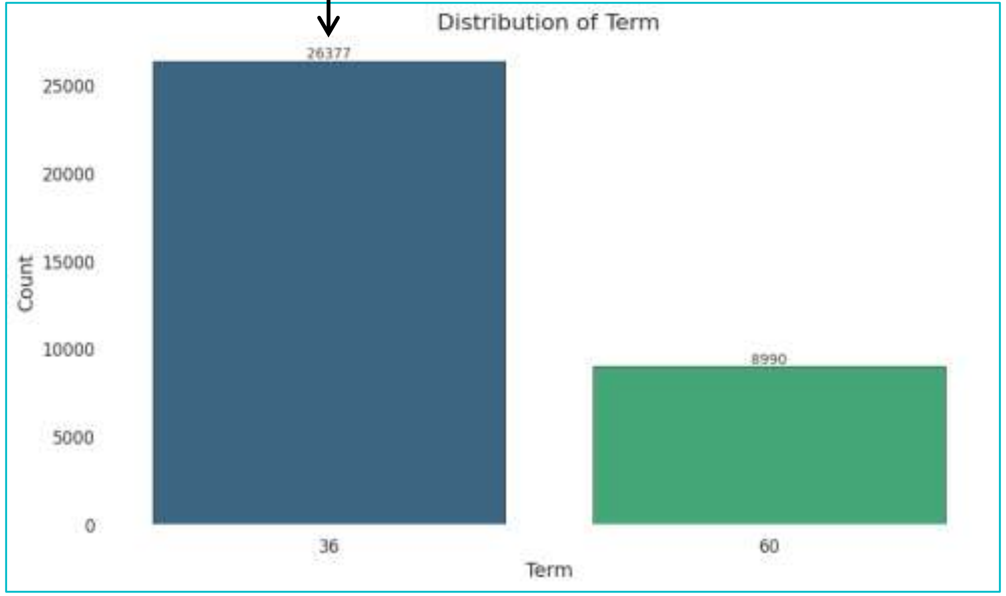


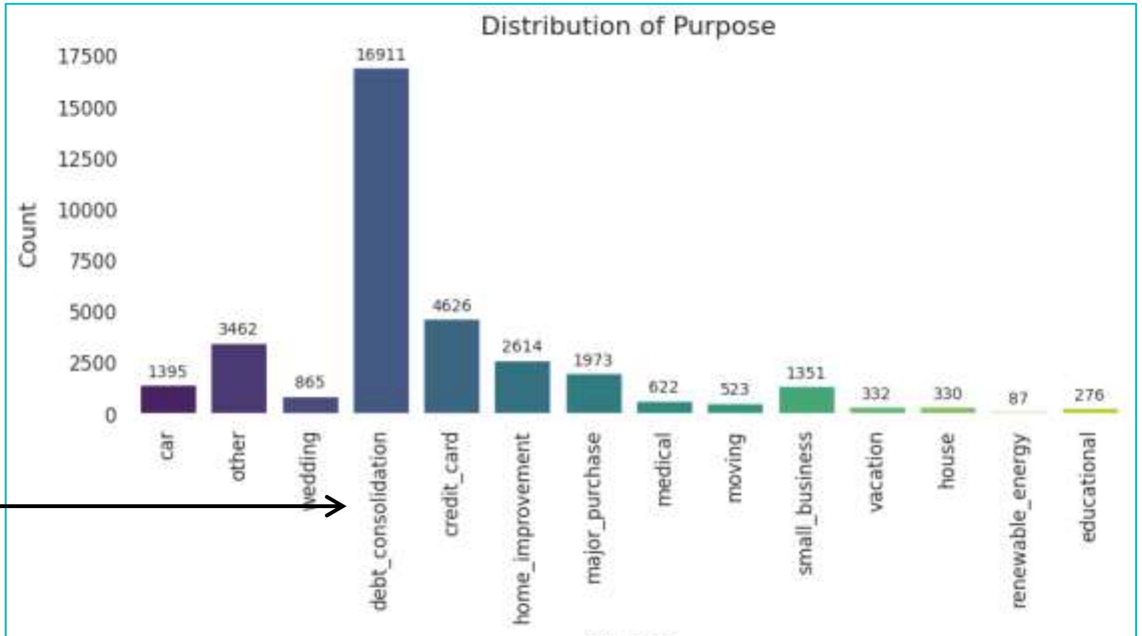
Digging Into Loan Patterns

- 56 % of loans under highest grade, with low interest -> more sales

- 75% of short term loans, ensuring faster recovery





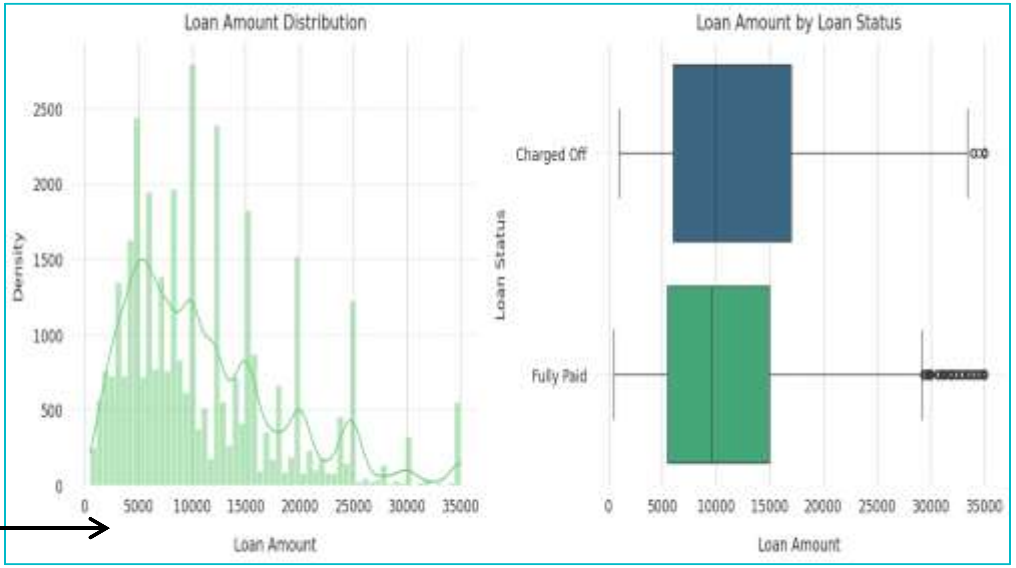


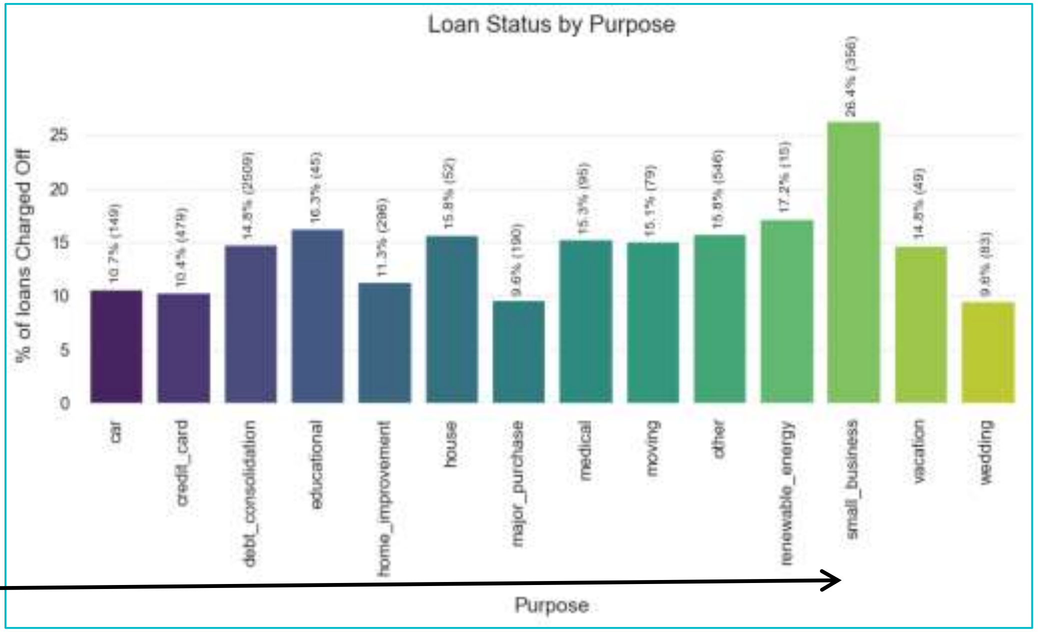
RISK!! More loans for debt consolidation

Default Risk - Loan Amount and Purpose

- **Loan Distribution:**
  - Most loans are between **$5,000** and **$15,000**
  - Loans **>$20,000** are less frequent

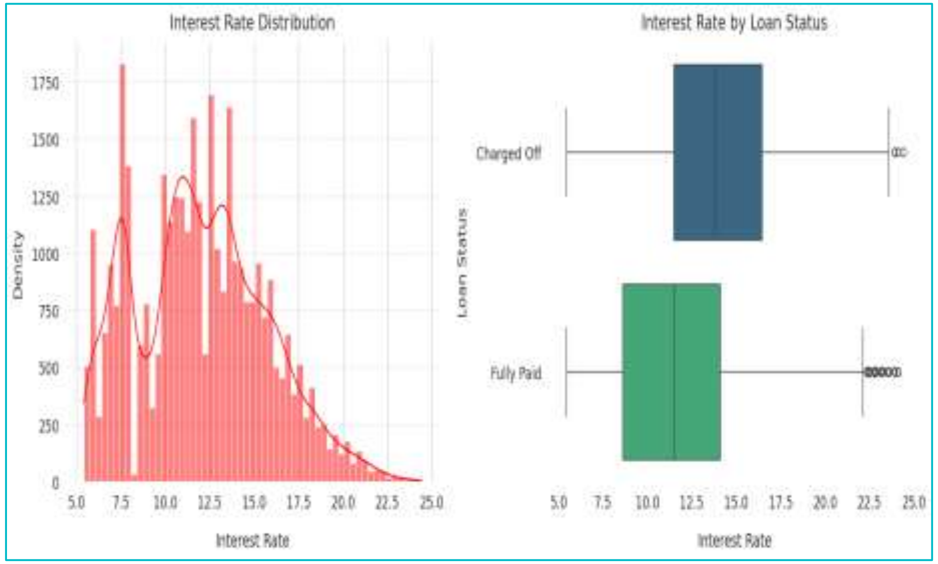
- **Default Risk:**
  - Loans between **$20,000–$35,000** show a higher likelihood of being **charged-off**, likely due to investment or business use.
  - As seen in Illustration – 2, around **26.5%** of loans taken for the purpose of “Small business” has been defaulted





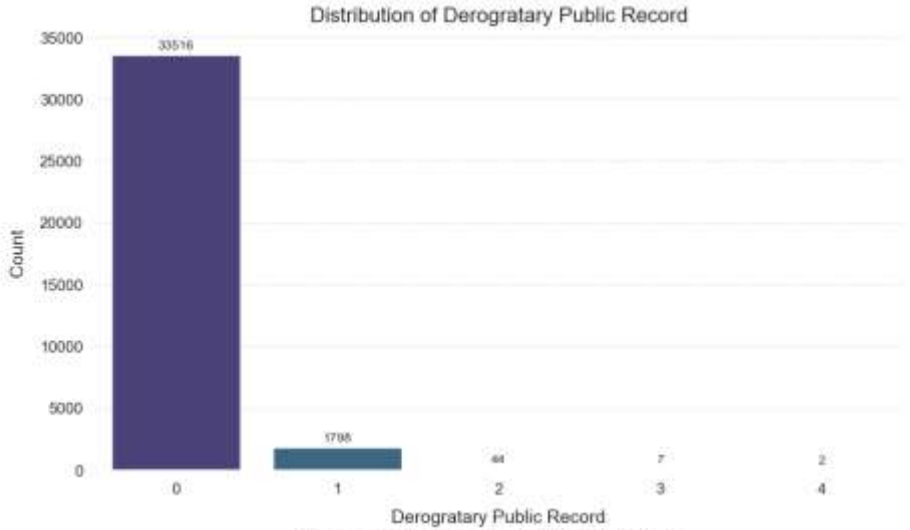
Default Risk - Interest Rate

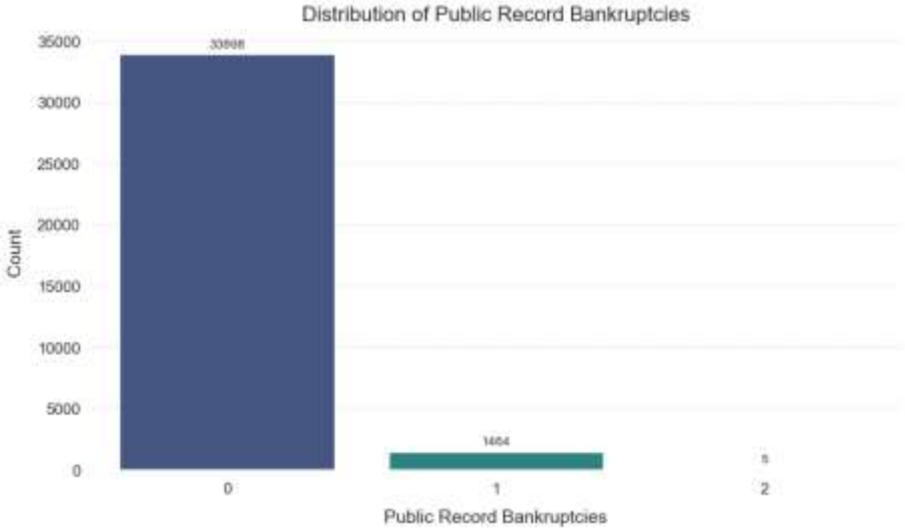
- **Loan Distribution:**
  - The interest rate on loans ranges from 5.42% to 24.4%, with an average of 11.8%.
  - Charged-off loans tend to have higher interest rates compared to fully paid loans



Default Risk by Customer Records

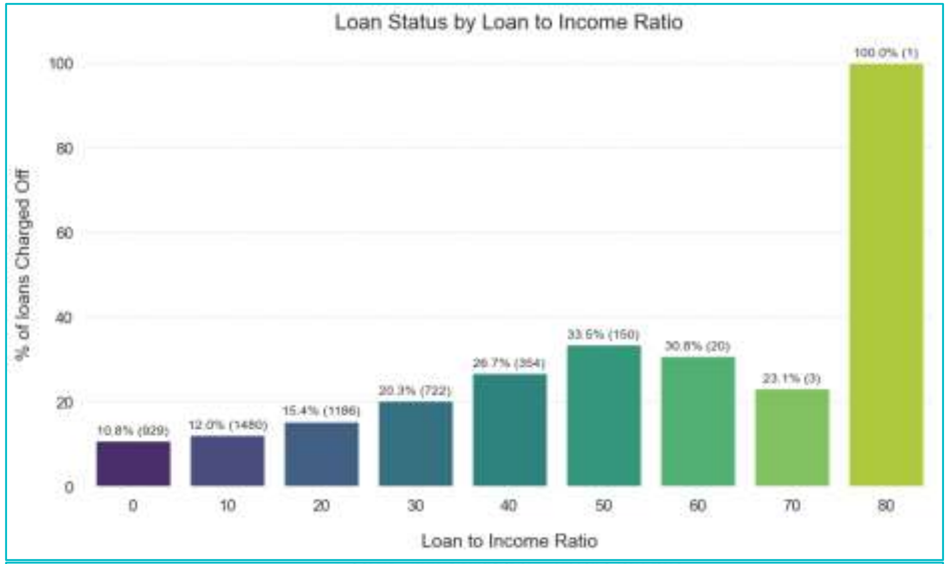
- **Loan Distribution**
  - Around **95%** of the loans were given to the customers with 0 Public derogatory records or public bankruptcy records
- **Default Risk:**
  - Records show Charged-off loans > **20%** for such customers
  - This should be considered strictly while disbursing the loan

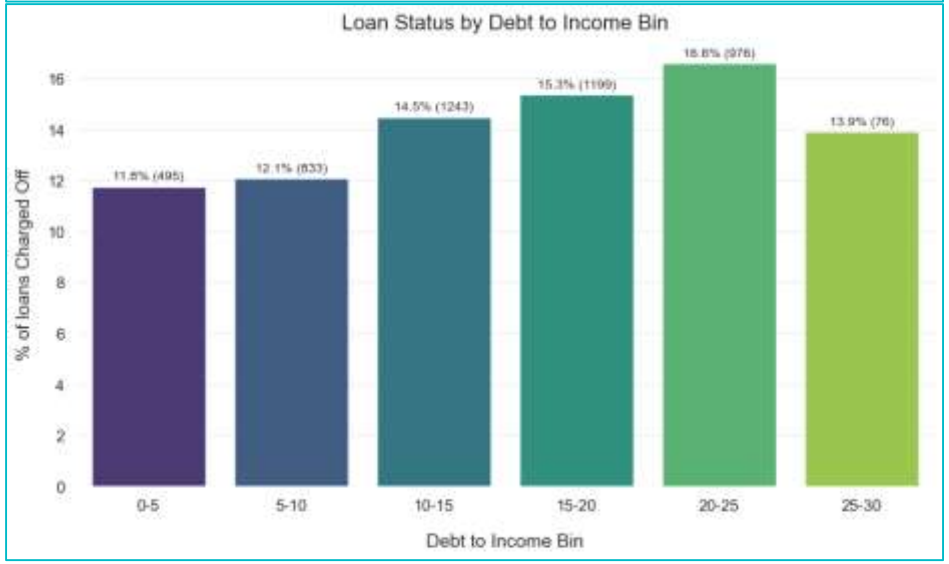




Default Risk Analysis Based on Customer Financials

- **Loan Distribution:**
  - Customer financials is an important aspect to be validated before the loan approval
  - Key parameters are the Loan Amount to Income ratio which will ensure the proper recovery of the loan
  - Another aspect is the customer debt to income ratio that shows the customer's capability to repay
- **Default Risks:**
  - Loan amounts of **30%** of annual income or higher see a high rate of default
  - Higher charge off trends for a dti of **20 or higher**





Risk mitigation strategies

Based on Loan Parameters:

- **Minimize** the loans approved on small business
- **Link** the loan interest rate to the customer financials like debt-to-income ratio
- **Encourage** short term loans (**36 months**) to reduce the charge-off

Based on Customer Parameters:

- **Customers** with public records of derogatory remarks or bankruptcy should be **excluded**.
- **Enforce stricter checks** on financial metrics such as Loan-to-Income ratio and Debt-to-Income ratio
- **Restrict** loans for customers with more than 3 credit inquiries in the last 6 months
- **Reduce loan approvals** for customers with revolving credit utilization above 13%.

Implications for Lenders

Informed Lending Practices

These findings can guide lenders in refining their lending practices to minimize risk and improve outcomes.

Understanding Risk Factors

By analyzing risk factors associated with defaults, lenders can enhance their decision-making processes and strategies.

Policy Development

Policymakers can use these insights to create effective policies that promote responsible lending and financial stability.