Credit Risk Analysis

Lending Case Study
Group Study
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Problem Statement

- **Challenge**: The lending industry faces a persistent challenge with loan defaults, which can result in financial losses and impact credit decisions.
- **Impact**: High loan default rates have substantial financial implications for lenders and investors, making it crucial to understand the factors driving these defaults.
- **Objective**: This analysis aims to identify the key drivers of loan defaults and uncover trends that can assist in mitigating risks.
- **Context**: In a dynamic financial landscape, where lending decisions have far-reaching consequences, a deeper understanding of the root causes of loan defaults is essential for making informed and proactive choices.

Data Overview and Analysis Methods

1. Data Sourcing: The dataset used: loan.csv
2. Data Cleaning: It involves
    a. Dropping missing values
    b. Dropping consistent values
    c. Formating data
    d. Handling outliers
3. Data Analysis: Following analysis were performed:
    a. Univariate Analysis
    b. Segmented Univariate Analysis
    c. Bivariate Analysis
    d. Derived Metrics
        i. Type-driven
        ii. Business-driven
        iii. Data-driven

Key Observations

Applicants are more likely to default when:

- Home ownership is 'RENT'
- Loan purpose is to clear other debts
- Interest rate falls in the range of 13-17%
- Annual income is between 31,201 - 58,402
- Number of open accounts is 20-37
- Employment length is 10 years
- Funded amount by investors is between 5,000 - 10,000
- Loan amount falls in the range of 5,429 - 10,357
- Debt-to-income ratio (DTI) is between 12-18

Key Observations (Contd.)

Applicants are more likely to default when:

- Monthly installments are between 145-274
- Loan term is 36 months
- Verification status is 'Not Verified'
- Number of inquiries in the last 6 months is 0
- Number of derogatory public records is 0
- Loan purpose is 'debt_consolidation'
- Grade is 'B'
- Sub-grade is 'B5'

Key Observations (Contd.)

Applicants are more likely to default when:

- Loan purpose is 'home improvement' with an income of 60k-70k
- Home ownership is 'MORTGAGE' with an income of 60k-70k
- Interest rate falls in the range of 21-24% with an income of 70k-80k
- Loan amount is between 30k - 35k with an interest rate of 15-17.5%
- Number of derogatory public records is 0
- Loan purpose is 'small business' and the loan amount is greater than 14k
- Home ownership is 'MORTGAGE' with a loan of 14k-16k

Key Observations (Contd.)

Applicants are more likely to default when:

- Grade is 'F' with a loan amount between 15k-20k
- Employment length is 10 years with a loan amount of 12k-14k
- Loan is verified with a loan amount above 16k
- Grade is 'G' and interest rate is above 20%

Recommendations and Conclusion

Recommendation:

- Based on the analysis, the following recommendations can be made:
  - Lenders should exercise caution when providing loans for 'debt consolidation' and 'small business' purposes.
  - Particular attention should be given to applicants with 'RENT' as their home ownership status.
  - Loans with higher interest rates (21-24% and above 20%) may warrant additional risk assessment.
  - Special considerations should be made for applicants with lower income ranges (e.g., 60k-70k).

Recommendations and Conclusion (Contd.)

Conclusion:

- In conclusion, our analysis has shed light on key factors affecting loan default probability. By implementing these recommendations, lenders can make more informed decisions and potentially reduce default rates, resulting in a more sustainable lending portfolio.