



 FINANCIAL ANALYTICS

Bank Loan Analysis

Transforming 38,000+ loan records into actionable insights for smarter lending decisions

Project Overview

This comprehensive analysis evaluates lending performance, customer profiles, credit risk, and repayment behavior across **38,576 loan records**.

The project transforms raw financial data into strategic insights, helping institutions understand borrower characteristics, loan distribution patterns, and overall portfolio health.

Analysis covers loan amounts, interest rates, income levels, credit grades, and repayment trends to optimize lending operations.



Purpose & Objectives



Monitor Trends

Track loan disbursement patterns over time



Analyze Borrowers

Evaluate income and employment patterns



Assess Risk

Evaluate credit grades and risk levels



Interest Rates

Understand rate distribution across segments



Track Performance

Assess repayment and loan outcomes

Key Features

1

Borrower Profiling

Comprehensive analysis based on income, employment length, and home ownership status

2

Credit Risk Assessment

Evaluation using loan grades and sub-grades for precise risk classification

3

Performance Evaluation

Loan performance tracking through total payment analysis and repayment trends

4

Distribution Analysis

Interest rate and loan amount patterns across borrower segments

5

Time-Based Insights

Temporal analysis using loan issue dates to identify seasonal trends

 TECHNOLOGY STACK

Tools & Technologies



Python

Core language for data analysis and processing workflows



Jupyter Notebook

Interactive analysis environment for iterative exploration



Pandas & NumPy

Data cleaning, aggregation, and numerical computations



Matplotlib & Seaborn

Advanced data visualization and statistical graphics



Excel Dataset

Source data repository with 38,576 loan records

DATA	MAX	MEAN	STD. DEV.	SUM
Interest	\$3,500	17,660	\$,950	05,0000
Debt	\$,050	\$,900	\$,990	\$15,500

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General	\$1,750	\$,000	\$,650	\$1,550
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Dataset Summary

Dataset Size

- **38,576 rows** of loan records
- **24 columns** of attributes

Key Attributes

- Loan ID, Address State, Application Type
- Employment Length & Title
- Loan Grade & Sub-grade
- Issue Date, Term (36 or 60 months)
- Annual Income, DTI Ratio
- Interest Rate, Loan Amount, Total Payment

Data Preparation

- Removed duplicate records
- Handled missing values in employment and income
- Standardized categorical variables
- Converted date columns for time analysis
- Ensured numeric consistency across metrics

KEY METRICS

Key Performance Indicators

\$435M

Total Loan Amount

Total value of loans disbursed, indicating portfolio size and capital deployment scale

\$11,296

Average Loan

Typical loan size per borrower, reflecting moderate lending exposure

12.05%

Average Interest Rate

Overall cost of borrowing, correlating with credit risk grades

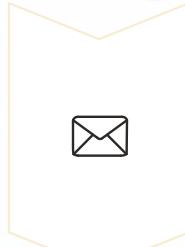
\$69,644

Average Income

Borrower income level, indicating middle-income target segment



Visual Analysis Insights



Loan Grade Distribution

Majority of loans fall under Grade B and C with limited exposure to high-risk grades F and G, maintaining balanced risk profile



Employment Length

Highest borrowers have 10+ years employment. Preference toward financially stable and experienced borrowers



Home Ownership

RENT and MORTGAGE categories dominate. Renting and mortgaged customers are primary loan seekers



Loan Amount Range

Majority between \$5,000–\$15,000. Portfolio focused on small-to-mid ticket loans

Loan Term Analysis



73% of borrowers prefer shorter 36-month terms, indicating lower long-term risk exposure and faster capital turnover.

The remaining **27% opt for 60-month terms**, typically for larger loan amounts requiring extended repayment periods.

Conclusion

Strong Portfolio

\$435.7M funded with \$473.1M repaid demonstrates excellent performance

Risk Management

Medium-grade borrowers (A-C) dominate with healthy DTI ratios

Strategic Focus

Short-term loans reduce default risk while maintaining profitability

This analysis of 38,576 loan records using Python and Excel reveals effective lending practices with well-calibrated interest rates against credit risk. The project demonstrates powerful financial data analysis capabilities that support informed, data-driven lending decisions for sustainable growth.

