

# Bank Loan Analysis

## Business Understanding

In this analysis, I'll delve into a dataset encompassing various features related to bank loan transactions. From loan application details to borrower characteristics and repayment statuses, I aim to gain insights into the bank's lending activities and performance. By examining key performance indicators (KPIs), loan classification (fully paid vs. charged off), average loan amounts across income brackets, and application trends over time, I seek to provide a comprehensive overview of the bank's lending landscape. Through this analysis, stakeholders can better understand the bank's lending practices, identify areas of improvement, and make informed decisions to optimize lending operations and mitigate risks effectively.

## Data Analysis with Visualization

- What are the overall KPI metrics?
- How is the bank doing in terms of good loans vs bad loans?
- What is the average loan amount depending on different income levels?
- How has the number of loan applications changed by month?

# What are the overall KPI metrics?

# Total Loan Applications

SELECT

COUNT(DISTINCT id) AS Total\_Applications

FROM

BankLoan

# Total Amount Funded

SELECT

SUM(loan\_amount) AS Total\_Amount\_Funded

FROM

BankLoan

# Total Amount Received

SELECT

SUM(total\_payment) AS Total\_Amount\_Received

FROM

BankLoan

# Average Interest Rate

SELECT

ROUND(AVG(int\_rate)\*100, 2) AS Avg\_Int\_Rate

FROM

BankLoan

# Avg DTI

SELECT

ROUND(AVG(dti)\*100, 2) AS Avg\_DTI

FROM

BankLoan

How is the bank doing in terms of good loans vs bad loans?

# Good Loan Applications

SELECT

COUNT(id) AS Good\_Loan\_Applications

FROM

BankLoan

WHERE

loan\_status = 'Fully Paid' OR loan\_status = 'Current'

# Good Loan Percentage

SELECT

(COUNT(CASE WHEN loan\_status = 'Fully Paid' OR loan\_status = 'Current' THEN id END) \*  
100.0) /

COUNT(id) AS Good\_Loan\_Percentage

FROM

BankLoan

# Good Loan Funded Amount

SELECT

SUM(loan\_amount) AS Good\_Loan\_Amount\_Funded

FROM

BankLoan

WHERE

loan\_status = 'Fully Paid' OR loan\_status = 'Current'

# Good Loan Amount Received

SELECT

SUM(total\_payment) AS Good\_Loan\_Amount\_Received

FROM

BankLoan

WHERE

loan\_status = 'Fully Paid' OR loan\_status = 'Current'

# Bad Loan Applications

SELECT

COUNT(id) AS Bad\_Loan\_Applications

FROM

BankLoan

WHERE

loan\_status = 'Charged Off'

# Bad Loan Percentage

SELECT

(COUNT(CASE WHEN loan\_status = 'Charged Off' THEN id END) \* 100.0) /

COUNT(id) AS Bad\_Loan\_Percentage

FROM

BankLoan

# Bad Loan Amount Funded

SELECT

SUM(loan\_amount) AS Bad\_Loan\_Amount\_Funded

FROM

BankLoan

WHERE

loan\_status = 'Charged Off'

# Bad Loan Amount Received

SELECT

SUM(total\_payment) AS Bad\_Loan\_Amount\_Received

FROM

BankLoan

WHERE

loan\_status = 'Charged Off'

# What is the average loan amount depending on different income levels?

WITH IncomeCTE AS (

SELECT

CASE

WHEN annual\_income < 5350.86 THEN 'Low Income'

WHEN annual\_income >= 5350.86 AND annual\_income < 134939.22 THEN 'Medium Income'

WHEN annual\_income >= 134939.22 THEN 'High Income'

ELSE 'Unknown'

END AS IncomeBracket,

loan\_amount

FROM

BankLoan)

SELECT

IncomeBracket,

AVG(loan\_amount) AS AverageLoanAmount

FROM

IncomeCTE

GROUP BY

IncomeBracket;

# How has the number of loan applications changed by month?

SELECT

MONTH(issue\_date) AS Month\_Munber,

DATENAME(MONTH, issue\_date) AS Month\_name,

COUNT(id) AS Total\_Loan\_Applications

FROM

BankLoan

GROUP BY

MONTH(issue\_date),

DATENAME(MONTH, issue\_date)

ORDER BY

MONTH(issue\_date)

## Conclusion

- **Loan Classification:** A significant portion of loans issued (86.2%) were classified as good loans, with 33K applications, 370M funded, and 436M received. Conversely, bad loans accounted for 13.8% of issued loans, with 5K applications, 66M funded, and 37M received. This highlights the importance of robust risk assessment and credit evaluation processes to minimize loan defaults.
- **Average Loan Amount by Income Bracket:** Analysis by income brackets revealed that borrowers with higher incomes tended to apply for and receive larger loan amounts. Specifically, average loan amounts were around 2K for low-income borrowers, 11K for medium-income borrowers, and 18K for high-income borrowers, underscoring income disparities in borrowing behavior. Develop targeted marketing strategies to attract borrowers across different income brackets, ensuring equitable access to lending opportunities while optimizing loan profitability.
- **Application Trends:** The number of loan applications demonstrated a gradual increase over the months, with January recording the lowest volume (2K applications) and December the highest (4K applications). Understanding these seasonal trends can inform resource allocation and staffing decisions to manage fluctuating application volumes effectively.
- **Continuous Monitoring and Evaluation:** Establish regular monitoring and evaluation processes to track lending performance metrics and identify emerging trends or areas requiring intervention, facilitating proactive decision-making and risk management.