

Milestone – IV

Bank Loan Analysis

Name: Keerthana M

Project Title: Bank Loan Analysis

Domain: Finance

Tools Used: Power BI, Excel, DAX

Skills: Data Visualization, Data Modeling, Analytical Thinking, Report Customization

Objective:

The objective of this project is to analyze and visualize bank loan data to uncover trends, assess risk, and support data-driven decision-making. The report focuses on understanding loan distribution across various categories such as purpose, grade, state, and borrower demographics. It highlights key metrics like total funded amounts, average interest rates, and DTI to evaluate funding efficiency and borrower profiles. By examining loan statuses and repayment trends, the report identifies high-risk segments and profitable opportunities. Additionally, it tracks year-to-date funding and regional performance to provide actionable insights for strategic planning. Borrower preferences, such as loan terms and homeownership, are analyzed to enhance loan approval strategies. This comprehensive analysis supports risk mitigation, performance optimization, and improved financial decision-making.

Page 1: Overview

Purpose:

This page provides a high-level summary of the loan dataset, with key performance indicators (KPIs), filters, and visuals to help users understand overall trends.

Components:

1. KPI Metrics:

- **Total Loan Applications:** Displays the count of all loan applications.

Total Loan Applications = COUNT(financial_loan[id])

- **Total Funded Amount:** The total value of loans funded.

$$\text{Total Funded Amount} = \text{SUM}(\text{financial_loan}[\text{loan_amount}])$$

- **Total Amount Received:** Total repayments received.

$$\text{Total Amount Received} = \text{SUM}(\text{financial_loan}[\text{Total_payment}])$$

- **Average Interest Rate:** The mean interest rate across all loans.

$$\text{Average Interest Rate} = \text{AVERAGE}(\text{financial_loan}[\text{Int_rate}])$$

- **Average DTI (Debt-to-Income Ratio):** The average DTI of borrowers.

$$\text{Average DTI} = \text{AVERAGE}(\text{financial_loan}[\text{DTI}])$$

2. Navigation Buttons:

Buttons to navigate to **Insights** and **Performance** pages.

3. Filters:

- State
- Amount Category (e.g., Low, Medium, High)
- Purpose (e.g., car, credit card, etc.)

4. Visuals:

- **Count of ID by Verification Status (Pie Chart):** Visualizes the proportion of loan applications categorized by their verification status (e.g., Verified, Source Verified, Not Verified).
- **Loan Status by Grade (Stacked Bar Chart):** Shows the distribution of loans across different grades (A, B, C, etc.) and their statuses (Charged Off, Current, Fully Paid).
- **Loan Amount by Term (Stacked Column Chart):** Compares loan amounts between 36-month and 60-month terms. Determine which term type (short-term or long-term) has higher funding amounts.

- **Loan Amount Category Distribution (Donut Chart):** Visualizes the distribution of loans across amount categories (Low, Medium, High, Very High). It Identify the most common loan amount categories.

```

Loan Amount Category =
SWITCH(
    TRUE(),
    financial_loan[Loan_amount] <= 10000, "Small",
    financial_loan[Loan_amount] <= 50000, "Medium",
    financial_loan[Loan_amount] > 50000, "Large",
    "Unknown"
)

```

- **Loan Amount by Home Ownership (Clustered Column Chart):** Displays loan amounts based on borrowers' homeownership status (e.g., Rent, Own, Mortgage). It Identify any trends in loan amounts based on housing situations.
- **Loan Amount by DTI Category (Clustered Bar Chart):** Shows the distribution of loan amounts across different DTI (Debt-to-Income) categories (Low, Medium, High, Very High).

```

DTI Category =
SWITCH(
    TRUE(),
    financial_loan[DTI] < 20, "Low",
    financial_loan[DTI] <= 35, "Medium",
    "High"
)

```

Page 2: Insights

1. Filters

- State
- Grade (e.g., A, B, C, etc.)
- Purpose (e.g., car, credit card, etc.)

2. Metrics Shown:

1. Total Loan Applications
2. Total Funded Amount
3. Total Amount Received

3. Visuals:

- **Monthly trends by Issue Date (Area Chart):** To identify seasonality and long-term trends in lending activities.
- **Regional Analysis by State (Filled Map):** To identify regions with significant lending activity and assess regional disparities.
- **Loan Term Analysis (Donut Chart):** To understand the distribution of loans across various term insights.
- **Employee Length Analysis (Bar Chart):** How lending metrics are distributed among borrowers with different employment lengths, helping us assess the impact of employment history of loan applications.
- **Loan Purpose Breakdown (Bar Chart):** It provides the visual breakdown of loan metrics based on the stated purposes of loans, aiding in the understanding of the primary reasons borrowers seek financing.

Page 3: Performance

1. Filters:

- State
- Amount Category (e.g., Low, Medium, High)
- Grade (e.g., A, B, C, etc.)

- Sub-Grade (e.g., A1, A2, A3, etc.,)
- Purpose (e.g., car, credit card, etc.)
- Term (e.g., 36 months, 60 months)

2. Visuals:

- **YTD Funded Amount by Month (Line Chart):** Tracks the cumulative funded amounts on a year-to-date (YTD) basis across months. It Identify funding trends throughout the year.

YTD Funded Amount =
TOTALYTD(
 [Total Funded Amount],
 Date Table[Date]
)

- **Average Interest Rate by Loan Purpose Group (Stacked Bar Chart):** Displays the average interest rates charged across different loan purposes. It Identify loan purposes associated with higher or lower interest rates.

Loan Purpose Group =
SWITCH(
 TRUE(),
 financial_loan[Purpose] IN
 {i“car”, “home improvement”, “major purchase”}, “Personal “,
 financial_loan[Purpose] IN
 {i“debt consolidation”, “credit card”}, “Financial”,
 financial_loan[Purpose] IN
 {i“educational”, “renewable_energy”}, “ Education & Energy”,
 “Other”
)

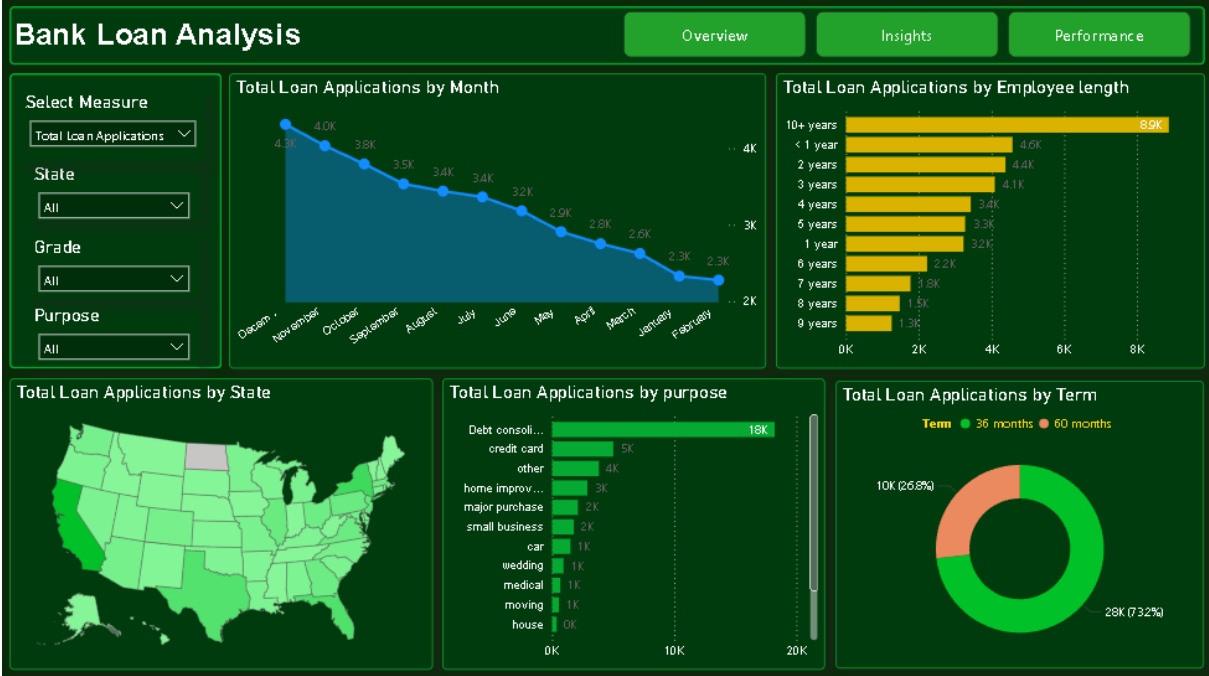
- **Total Funded Amount by Quarter (Area Chart):** Highlights quarterly trends in loan funding amounts. It Understand the growth or decline in funding over quarters.
- **Average Interest Rate by Sub-Grade (Clustered Column Chart):** Compares average interest rates across sub-grades (e.g., A1, A2, B1). Identify sub-grades associated with higher risks (and higher interest rates).

Dashboards:

Page 1: Overview



Page 2: Insights



Page 3: Performance



Conclusion:

This bank loan analysis project provides a comprehensive understanding of loan data through detailed visualizations and actionable insights. By leveraging interactive dashboards, key metrics such as total funded amounts, average interest rates, and DTI were analyzed to evaluate loan performance and borrower profiles. The visualizations highlight significant trends, including loan purpose preferences, state-wise funding patterns, and the impact of borrower attributes like homeownership and employment length. Risk assessment through loan status and grade distributions has enabled the identification of high-risk segments, aiding in better decision-making for loan approvals. Additionally, time-based analyses, such as YTD funding and quarterly performance, reveal patterns that can guide strategic planning. Overall, this report empowers stakeholders to optimize financial strategies, mitigate risks, and enhance lending efficiency for sustainable growth.