

FINANCIAL BANK LOAN INSIGHTS

Milestone 4 – Infosys Internship

TOPIC: Financial Bank Loan Insights using Power BI

Introduction:

Bank loans are a crucial financial tool that enables individuals and businesses to achieve their goals and manage financial needs. However, it's essential for borrowers to understand the terms, costs, and responsibilities associated with loans to make informed financial decisions. A financial bank loan is a formal agreement where a bank provides funds to an individual or organization, typically for a specific purpose such as personal needs, business expansion, education, or purchasing assets.

Data Preprocessing:

1. **Loading Data:** Import from sources like Excel, SQL Server, or CSV using **Get Data**.

2. **Data Cleaning:**

- Remove duplicates.
- Handle missing values (replace or remove).
- **Trim spaces, standardize** text, and correct errors.

3. **Data Transformation:**

- Rename columns/tables and change data types.
- Split/merge columns and reshape data with pivot/unpivot.

4. **Data Filtering:** Include/exclude rows or columns based on conditions.

5. **Data Enrichment:**

- Add calculated columns.
- Combine datasets using joins or append.

6. **Grouping & Aggregation:** Summarize data using sums, averages, or counts.

7. **Remove Unnecessary Data:** Delete irrelevant rows/columns for efficiency.

DAX Measures and Calculations:

1. Annual_Income by Grade:

Annual_Income by Grade = AVERAGE(financial_loan[annual_income])

It calculates the average annual income from the annual income column in the financial loan table.

2. Average Installment:

Average Installment = AVERAGE(financial_loan[installment])

It calculates the average installment from the installment column in the financial loan table.

3. Avg Loan_Amount:

Avg Loan_Amount = AVERAGE(financial_loan[loan_amount])

It calculates the average loan_amount from the loan_amount column in the financial loan table.

4. Interest_Rate by Term:

Interest_RatebyTerm= =

AVERAGEX(VALUES(financial_loan[term]),CALCULATE(AVERAGE(financial_loan[int_rate])))

It calculates the average interest rate for each unique loan term (term) in the financial_loan dataset. It evaluates the average interest rate for each term and then computes the overall average of those values. This helps analyze how interest rates differ across various loan terms.

5. Loan Amount By Purpose:

Loan Amount By Purpose = SUM(financial_loan[loan_amount])

It calculates sum of loan_amount by purpose from the loan_amount column in the financial loan table.

6. Total Loan_Amount:

Total Loan_Amount = SUM(financial_loan[loan_amount])

It calculates the Total Loan Amount from the loan amount column in the financial loan table.

7. Total Payment_Collected:

Total Payment_Collected = SUM(financial_loan[total_payment])

It calculates the total payment collected by summing up all the values in the total_payment column of the financial_loan dataset.

8. High Debt-to-Income:

High Debt-to-Income = IF(financial_loan[debt-income_ratio] > 0.4, 1, 0)

It identifies loans with a high debt-to-income ratio. It assigns a value of 1 if the debt-income_ratio exceeds 0.4, indicating a high financial burden, and 0 otherwise. This helps flag borrowers who may have higher financial risk due to significant debt compared to their income.

9. Loan Status Category:

Loan Status Category =

```
SWITCH(  
    TRUE(),  
    financial_loan[loan_status] IN {"Fully Paid", "Current"}, "Active",  
    financial_loan[loan_status] IN {"Charged Off", "Default"}, "Defaulted",  
    "Unknown"  
)
```

It categorizes loan statuses using the SWITCH function. If the loan_status is "Fully Paid" or "Current," it is labeled as "Active." If it is "Charged Off" or "Default," it is categorized as "Defaulted." Any other status is marked as "Unknown."

10. Loan_Status_Flag:

Loan_Status_Flag =

```
IF(financial_loan[loan_status] = "Fully Paid", "Paid",  
    IF(financial_loan[loan_status] = "Charged Off", "Defaulted", "Other"))
```

If the loan_status is "Fully Paid," it is labeled as "Paid." If the status is "Charged Off," it is marked as "Defaulted." For all other statuses, it is categorized as "Other." This helps in simplifying and standardizing loan status reporting.

11. Monthly Income:

Monthly Income = DIVIDE(financial_loan[annual_income],12,0)

It calculates the monthly income by dividing the annual income (annual_income) by 12. If the annual income is unavailable or zero, the result defaults to 0.

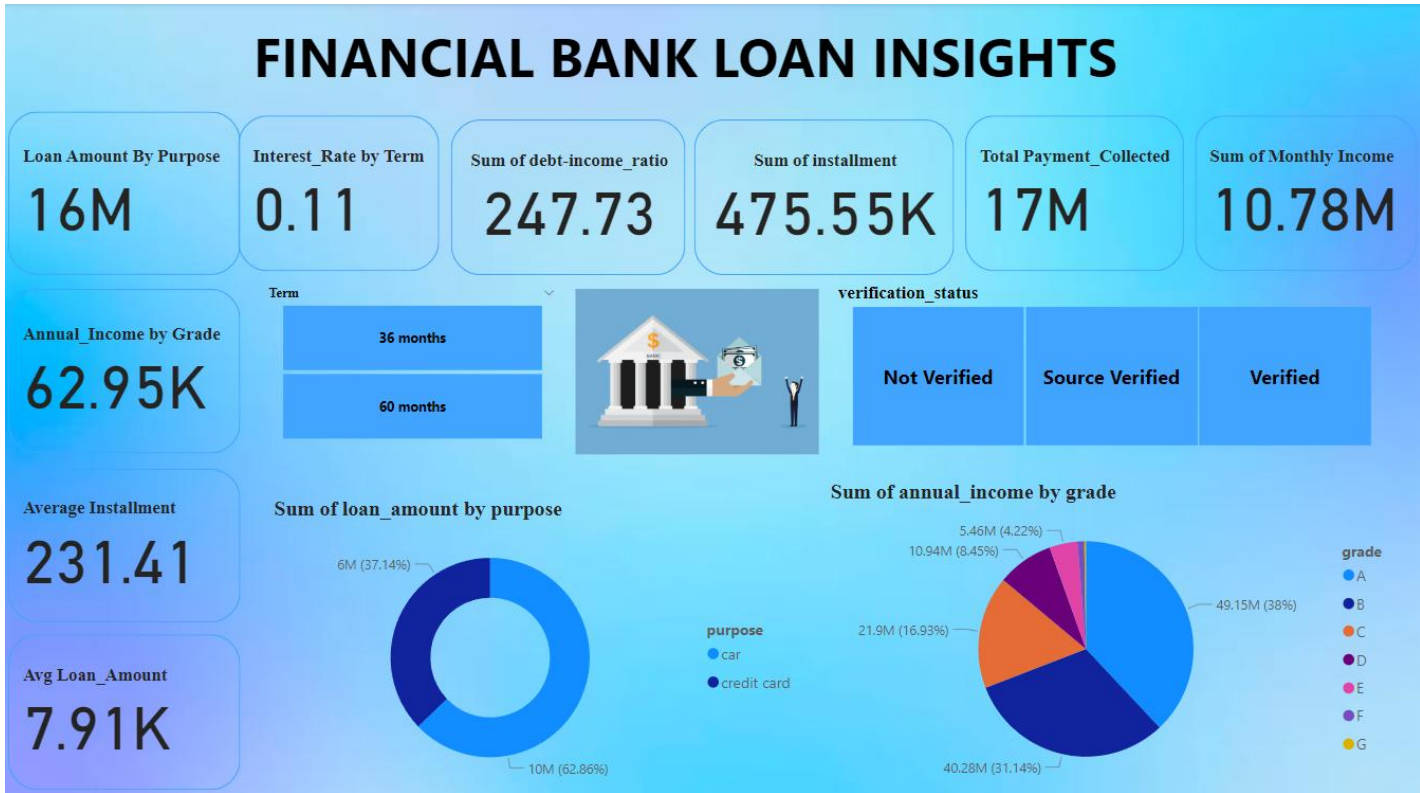
12. Sub-Grade Parent Category:

Sub-Grade Parent Category = LEFT(financial_loan[sub_grade], 1)

It extracts the first character of the sub_grade field in the financial_loan dataset. This groups the sub-grades into their parent grade categories.

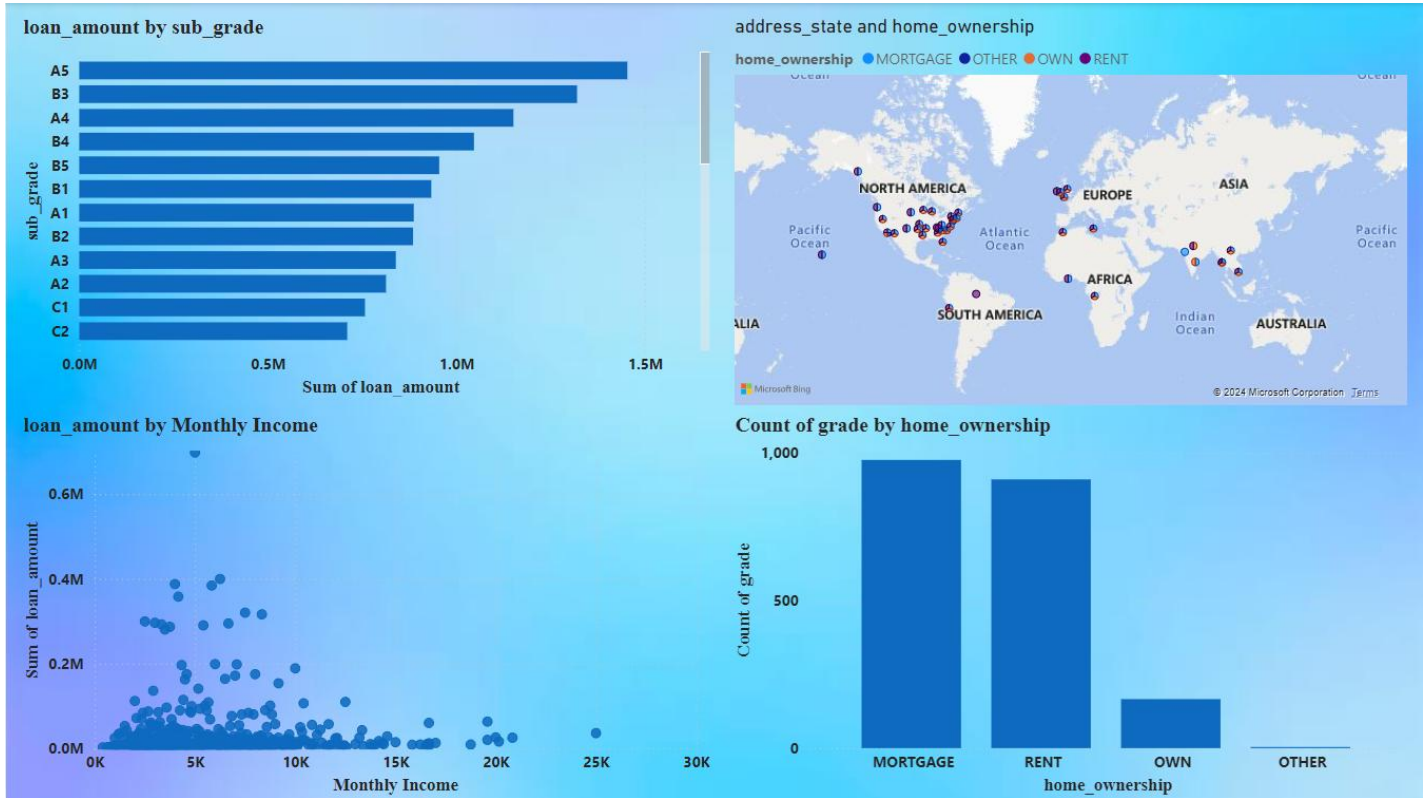
Report View:

Report Image-1:



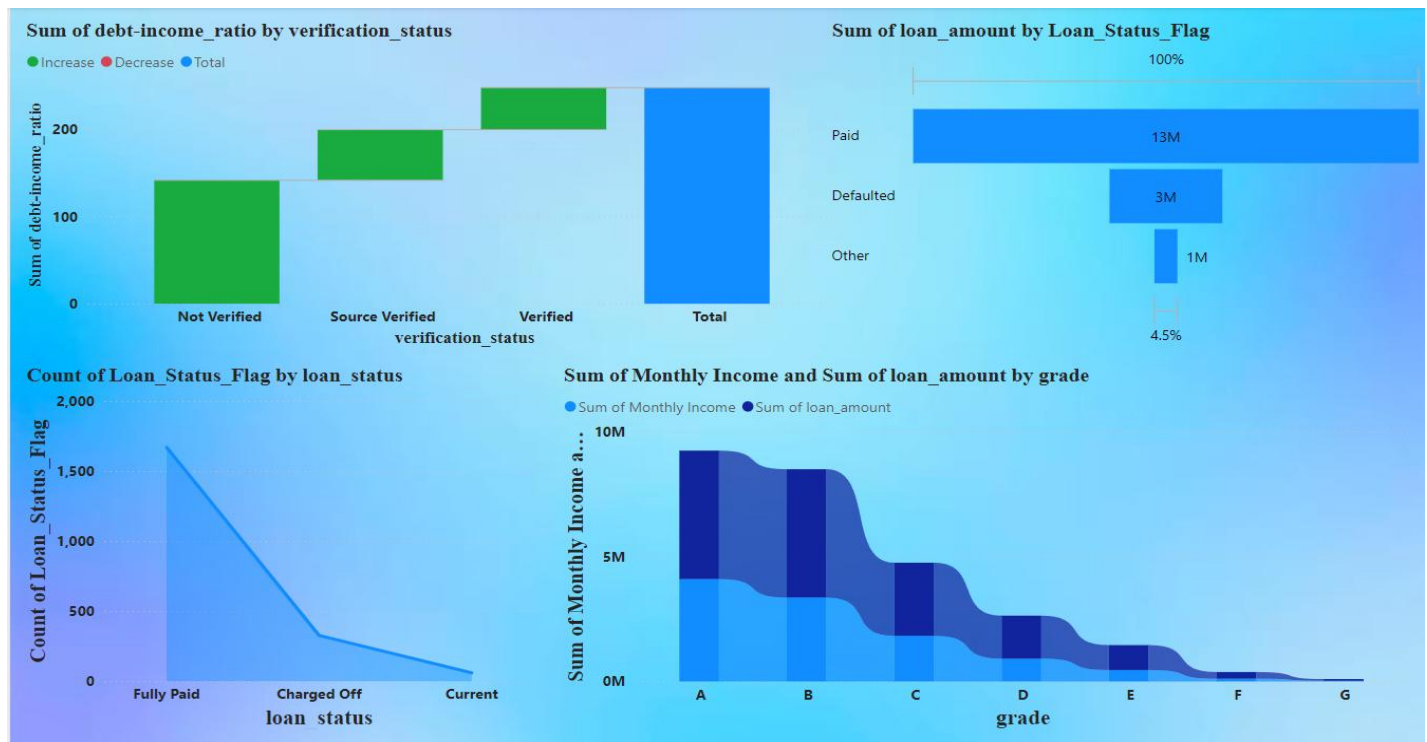
This dashboard provides insights into a financial bank's loan data, breaking down various metrics like loan amount, income, and installment. The "Loan Amount By Purpose" shows a total of \$16 million, primarily allocated to car and credit card loans, with car loans making up 62.86%. The average loan amount is \$7.91K, while the average installment stands at \$231.41. Interest rates average 0.11, with most loans set for either 36 or 60 months. The total payment collected amounts to \$17 million, while the monthly income sum is \$10.78 million. Annual income distribution by grade shows Grade A borrowers earning the most (38% of the total income), and the verification status is categorized into "Not Verified," "Source Verified," and "Verified." This visualization helps highlight lending patterns, customer income profiles, and loan purposes.

Report Image - 2:



This dashboard provides insights into loan distribution based on sub-grades, home ownership, and income levels. The "Loan Amount by Sub-Grade" chart shows that sub-grades like A5 and B3 have the highest loan amounts, each exceeding 1 million. The scatter plot of "Loan Amount by Monthly Income" indicates that higher loan amounts are generally associated with lower income brackets, though there are exceptions. The world map displays loan distribution by location and home ownership types, with most loans in North America. The "Count of Grade by Home Ownership" bar chart reveals that "Mortgage" and "Rent" are the most common home ownership statuses among borrowers, with fewer loans associated with "Own" and "Other" categories. This data helps identify patterns in loan distribution relative to income and home ownership.

Report Image - 3:



This dashboard provides an analysis of debt-to-income ratios, loan status, and income distribution by loan grade. The "Sum of Debt-Income Ratio by Verification Status" shows that unverified loans have higher debt-to-income ratios, while verified loans are lower. The "Sum of Loan Amount by Loan Status Flag" highlights that most loans are paid (\$13M), with smaller amounts in default (\$3M) or other statuses. The "Count of Loan Status Flag by Loan Status" reveals that most loans are fully paid, with fewer charged off or current. Lastly, the "Sum of Monthly Income and Sum of Loan Amount by Grade" illustrates that higher loan grades (A and B) have higher incomes and loan amounts, which taper off in lower grades. This provides insight into the financial health and repayment trends across different loan verification and grade levels.

Conclusion:

The financial bank loan insights reveal key trends in loan financial analysis, borrower insights, and risk analysis. Higher loan amounts are generally associated with borrowers of higher grades and verified incomes, while lower grades correspond with smaller loans and lower incomes. The majority of loans are fully paid, with a smaller proportion defaulted, reflecting a stable repayment pattern overall. Debt-to-income ratios are notably higher among unverified loans, suggesting a higher risk for loans without verification.