

FINANCIAL BANK LOAN ANALYSIS

Milestone 4 – Infosys Internship

TOPIC: Financial Bank Loan Analysis 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. Average Interest Rate:

Average Interest Rate = `AVERAGE('financial_loan(1)'[int_rate])`

It calculates the average interest rate from the average interest rate column in the financial loan table.

2. Average Installment:

Average Installment = `AVERAGE('financial_loan(1)'[installment])`

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

3. Default Rate:

Default Rate =

```
DIVIDE(
    CALCULATE(COUNTROWS('financial_loan(1)', 'financial_loan(1)'[loan_status] = "Charged Off"),
    COUNTROWS('financial_loan(1)')
)
```

It calculates the default rate by this financial loan analysis table. By using the CALCULATE function and Divide Function

4. payment percentage:

Payment Percentage =

```
DIVIDE(
    SUM('financial_loan(1)'[total_payment]),
    SUM('financial_loan(1)'[loan_amount]),
    0
)
```

It calculates the **Payment Percentage** by determining the ratio of the total payments (total_payment) the total loan amount (loan_amount) from the financial_loan(1) table. It uses the DIVIDE function to perform the division safely, ensuring that if the denominator (sum of loan_amount) is zero, the result will default 0 instead of causing an error. The SUM function aggregates the values of total_payment and loan_amount, ensuring that the calculation considers all relevant rows in the context of the query or report..

5. Loan Amount By Purpose:

Loan Amount By Purpose = SUM('financial_loan(1)'[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(1)'[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(1)'[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(1)'[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:

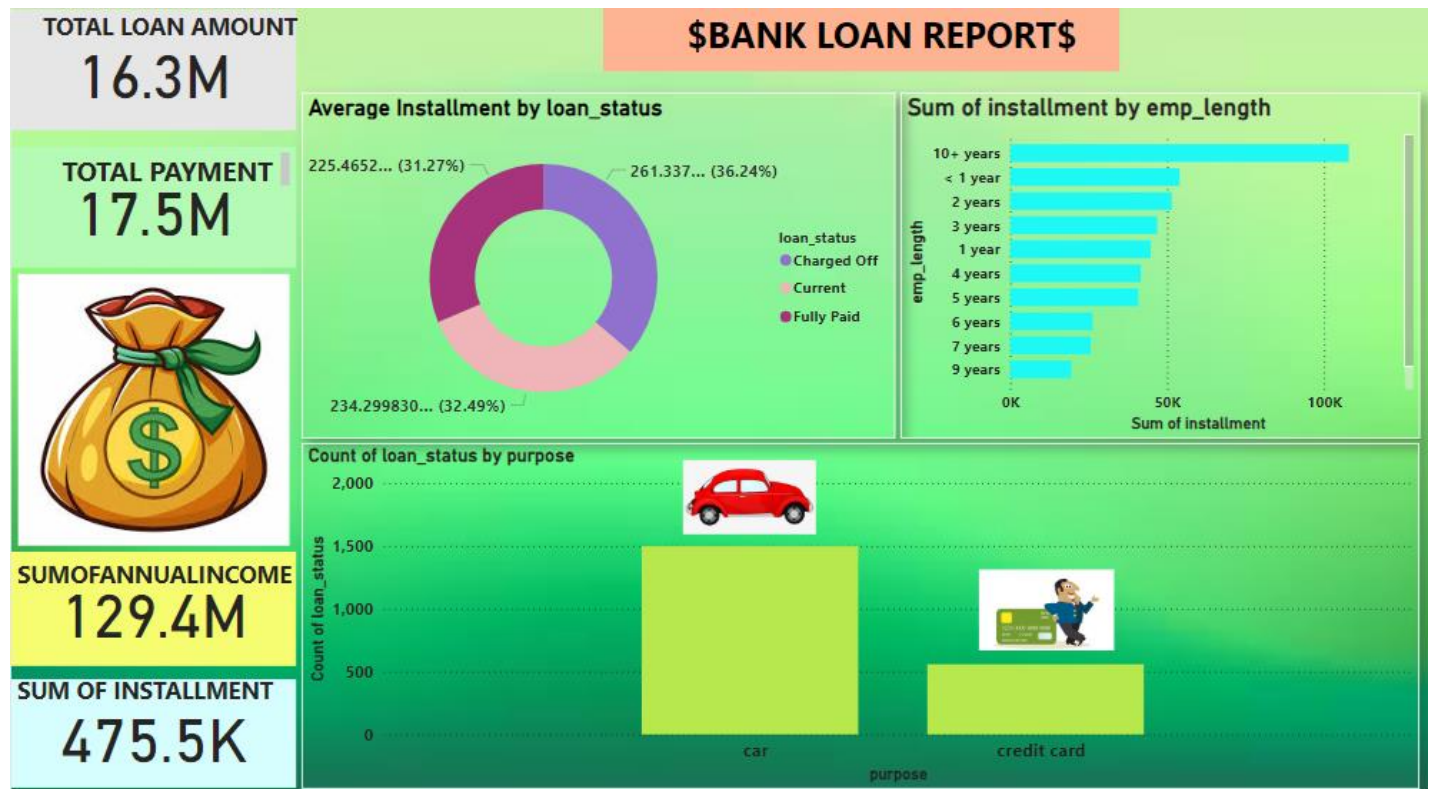
Loan Status Category =

```
SWITCH(  
    TRUE(),  
    'financial_loan(1)'[loan_status] IN {"Fully Paid", "Current"}, "Active",  
    'financial_loan(1)'[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."

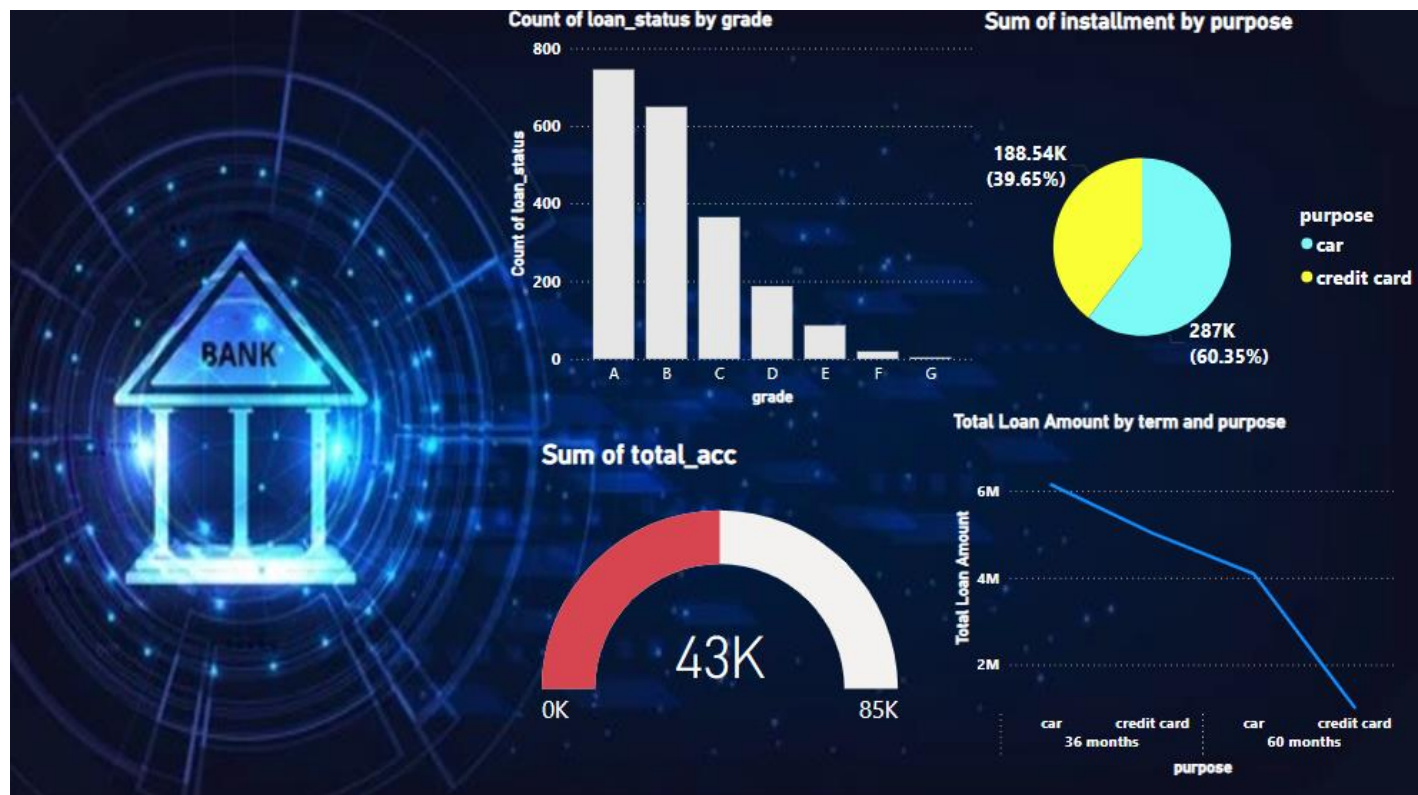
Report View:

Report Image-1:



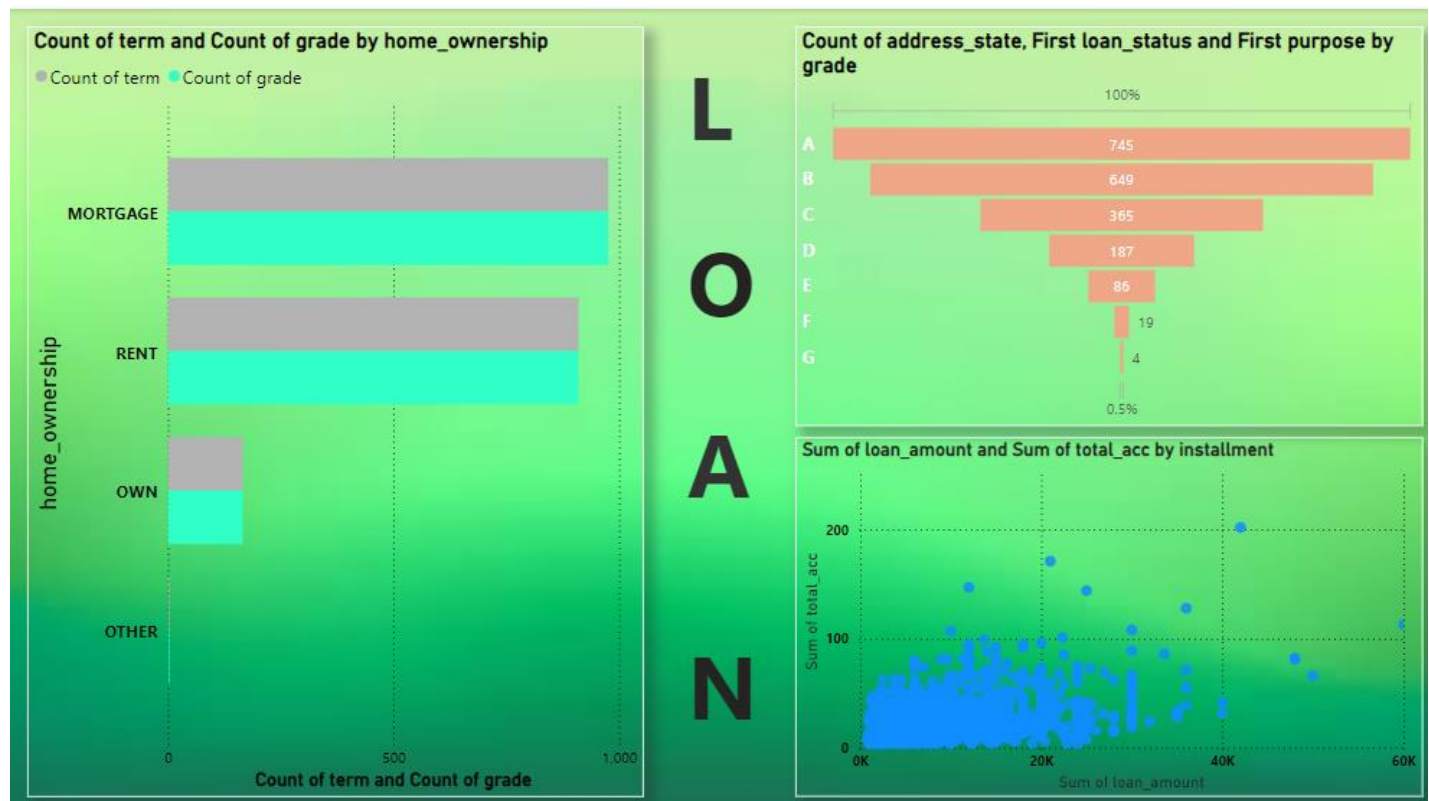
This dashboard provides insights into a financial bank's loan data, breaking down various metrics like loan amount, income, and installment. The "Total Loan Amount" shows a total of \$16.3 million, primarily allocated to car and credit card loans. The total payment is 17.5 million, next comes to the sum of Annual income is 129.4 million, and the sum of installment is 475.5 thousands. The donut chart represents the average installment by the loan status contains three legends like charge off, current, fully paid. the clustered bar chart represents the sum of installments by emp_length. the stacked column chart represents the count of loan status by purpose like car and credit. As car having highest count of loan status while compared to the credit loan. 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 term and purpose" line chart shows that the time duration of 36 months and 60 months by the purposes car, credit, and tell us that the car in 33 months duration having nearly highest loan amount when compared with remaining. And the pie chart Represents the sum of installments by purpose and car is having highest installment price than compared to credit. The Gauge meter tell us about the sum of total account that is 43K. And the bar Chart represents the count of loan Status by the grade. And the grades we are having A-G. It represents the grade a is having the count of loan status high while compared to all other grades. This data helps identify patterns in loan distribution relative to income and home ownership.

Report Image - 3:



This dashboard provides an analysis of count of term and count of product by home ownership and it consists of Mortgage, rent, own, other by the representation of a bar chart. and it represents that the mortgage is having high count of grade and high count of term according to the visualization they have been represented and the terms like count of term and count of grade is represented on the X axis of the graph. Coming to the next visualization that it is a funnel chart that provides us a lot of information about the grades and count of address states, first loan states and purpose by grade.

Among all the grades, the grade A has the highest count of address_state and as represented in the funnel chart at the top while compared to the other grades. This provides insight into the financial 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.