



BANK LOAN PERFORMANCE ANALYSIS

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I. Introduction

The ability to retain customers effectively is crucial for businesses aiming to maintain a competitive edge in today's market. This project explores customer retention strategies by leveraging predictive analytics to identify key factors influencing customer loyalty. Through advanced data analysis techniques, we will examine customer behavior patterns and preferences to develop actionable insights. Our goal is to improve customer retention rates and optimize marketing strategies, ultimately leading to increased customer satisfaction and business growth. This project promises to enhance our understanding of customer dynamics and provide valuable recommendations for strategic decisionmaking.

II. Objective

The main objective of this project is to analyze the loan and borrower data to:

- Identify factors that influence loan performance.
- Understand borrower profiles and their impact on loan repayment.
- Provide insights that can assist in improving loan approval processes and risk assessment.

III. Data Overview

Component	Description
Dataset	Bank Loan Performance Data
Data Size	Borrower Details Table: 466,286 rows Loan Details Table: 466,286 rows
Data Sources	Internal bank systems, loan application databases, borrower records
Table	Key Columns
LoanDetails	Loan ID: Identifier for each loan record Loan Amount: Total amount of the loan issued Term: Length of the loan in months Interest Rate: Annual interest rate charged Issue Date: Date when the loan was initiated Last Payment Date: Date of the most recent payment Total Payment: Cumulative amount paid by the borrower Principal Outstanding: Remaining balance of the loan Loan Status: Status of the loan (e.g., Fully Paid, Charged Off, Late)
BorrowerDetails	Borrower ID: Identifier for each borrower Employment Length: Duration of borrower's employment in years Annual Income: Yearly income of the borrower DebttoIncome Ratio: Ratio of total debt to income Home Ownership: Status of home ownership (e.g., Own, Rent) Purpose: Purpose of the loan (e.g., Debt Consolidation, Home Improvement) Verification Status: Indicator of whether income was verified

IV. Data Cleaning

Objective: Clean the data by handling missing values, removing duplicates, and correcting inconsistencies.

a. Handling Missing Values

Steps:

- ▶ Open Power Query Editor by selecting **Transform Data**.
- ▶ For the "BorrowerDetails" table, replace missing values in the 'emp_length' column with '0 year':
 - ▶ Right-click on the 'emp_length' column → **Replace Values**.
 - ▶ Set "**Value to Find**" as null and "**Replace With**" as 0 year.

Example:

The screenshot shows the Microsoft Power Query Editor interface. The 'BorrowerDetails' table is selected. The 'emp_length' column header is highlighted. The 'Applied Steps' pane on the right shows the step 'Replaced Null Value to 0 years'.

loan_id	emp_length	home_ownership	annual_inc	verified
1296599	10+ years	RENT	24000	Verified
1314167	< 1 year	RENT	30000	Source \
1313524	10+ years	RENT	12252	Not Veri
1277178	10+ years	RENT	49200	Source \
1311748	1 year	RENT	80000	Source \
1311441	3 years	RENT	36000	Source \
1304742	8 years	RENT	47004	Not Veri
1288686	9 years	RENT	48000	Source \
1306957	4 years	OWN	40000	Source \
1306721	< 1 year	RENT	15000	Verified
1305201	5 years	OWN	72000	Not Veri
1305008	10+ years	OWN	75000	Source \
1298717	< 1 year	RENT	30000	Source \
1304956	3 years	RENT	15000	Source \
1303503	3 years	RENT	100000	Source \
1304871	< 1 year	RENT	28000	Not Veri
1299699	4 years	RENT	42000	Not Veri
1304884	10+ years	MORTGAGE	110000	Not Veri
1294539	1 year	MORTGAGE	84000	Verified
1304855	6 years	RENT	77385.19	Not Veri
1284848	3 years	RENT	43370	Verified

b. Handling Missing Rows

- 💡 Remove rows with missing values in the 'last_pymnt_d' and 'delinq_2yrs' columns:
- 💡 Select both columns → **Remove Rows** → **Remove Rows with Missing Values**.

The screenshot shows the Microsoft Power Query Editor interface. The main area displays a table named 'BorrowerDetails' with four columns: 'id', 'delinq_2yrs', 'last_pymnt_d', and 'total_pymnt'. The 'last_pymnt_d' column contains numerous null values. To the right, the 'APPLIED STEPS' pane is open, showing a list of steps taken during the data transformation process. The 'Filtered Rows1' step is highlighted with a red box, indicating it was used to remove rows with missing values from the 'last_pymnt_d' column.

c. Removing Duplicates

Steps:

- 💡 Identify duplicates in the 'id' column of the "LoanDetails" table:
- 💡 Select the 'id' column → **Remove Duplicates**.

Example:

Bank Loan Performance Analysis

Power Query Editor - Untitled - Bank Loan Performance Analysis

APPLIED STEPS

- Removed Duplicates

	Id	loan_amnt	funded_amnt	term	int_rate
1	1077501	5000	4975	36 months	1.2
2	1077430	2500	2500	60 months	1.2
3	1077175	2400	2400	36 months	1.2
4	1076863	10000	10000	36 months	1.2
5	1075358	3000	3000	60 months	1.2
6	1075269	5000	5000	36 months	1.2
7	1069639	7000	7000	60 months	1.2
8	1072053	3000	3000	36 months	1.2
9	1071795	5600	5600	60 months	1.2
10	1072150	5375	5350	60 months	1.2
11	1070078	6500	6500	60 months	1.2
12	1069908	12000	12000	36 months	1.2
13	1064687	9000	9000	36 months	1.2
14	1069866	3000	3000	36 months	1.2
15	1068057	10000	10000	36 months	1.2
16	1069759	1000	1000	36 months	1.2
17	1065575	10000	10000	36 months	1.2
18	1069971	3600	3600	36 months	1.2
19	1062474	6000	6000	36 months	1.2
20	1069742	9200	9200	36 months	1.2
21	1069740	20250	19142.16108	60 months	1.2

d. Dealing with Inconsistencies:

- Ensure words in the 'purpose' column are separated by spaces instead of underscores (e.g., "credit card" instead of "credit_card").

Power Query Editor - Untitled - Bank Loan Performance Analysis

APPLIED STEPS

- Replaced " " to " "

	sub_grade	issue_d	loan_status	purpose
1	B2	12/01/2018	Fully Paid	credit card
2	C4	12/01/2018	Charged Off	car
3	C5	12/01/2018	Fully Paid	small business
4	C1	12/01/2018	Fully Paid	other
5	B5	12/01/2018	Current	other
6	A4	12/01/2018	Fully Paid	wedding
7	C5	12/01/2018	Current	debt consolidation
8	E1	12/01/2018	Fully Paid	car
9	F2	12/01/2018	Charged Off	small business
10	B5	12/01/2018	Charged Off	other
11	C3	12/01/2018	Fully Paid	debt consolidation
12	B5	12/01/2018	Fully Paid	debt consolidation
13	C1	12/01/2018	Charged Off	debt consolidation
14	B1	12/01/2018	Fully Paid	credit card
15	B2	12/01/2018	Charged Off	other
16	D1	12/01/2018	Fully Paid	debt consolidation
17	C4	12/01/2018	Fully Paid	home improvement
18	A1	12/01/2018	Fully Paid	major purchase
19	B3	12/01/2018	Fully Paid	medical
20	A1	12/01/2018	Fully Paid	debt consolidation
21	C4	12/01/2018	Fully Paid	debt consolidation

- Format the 'purpose' column to proper case.

Bank Loan Performance Analysis

The screenshot shows the Microsoft Power Query Editor interface. The ribbon at the top includes File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The left sidebar lists 'Queries [2]' with 'BorrowerDetails' and 'LoanDetails' selected. The main area displays a table titled '#Replaced " " _ " " to " " values' with columns: sub_grade, issue_d, loan_status, and purpose. The 'Transform' ribbon tab is active, showing various tools like Close & Apply, New Source, Refresh, Manage Parameters, Properties, Advanced Editor, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Sort, Split Column By, Group By, Replace Values, Merge Queries, Append Queries, Combine Files, and Text Analytics. A 'Query Settings' pane on the right shows properties for 'LoanDetails' and applied steps including 'Replaced " " _ " " values' and 'Capitalized Each Word in Pur...'. The bottom status bar indicates '11 COLUMNS, 999+ ROWS' and 'Column profiling based on top 1000 rows'.

💡 Format the 'home_ownership' columns proper case.

The screenshot shows the Microsoft Power Query Editor interface. The ribbon menu includes File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The ribbon also features sections for Data source settings, Manage Parameters, Refresh, Properties, Advanced Editor, and a large set of transformation tools like Choose Columns, Remove Rows, Sort, Split Column, Group By, and Replace Values.

The main workspace displays a table titled "BorrowerDetails" with 11 columns and 999+ rows. The columns are labeled: member_id, loan_id, emp_length, home_ownership, and annual_inc. The data shows various employment lengths (e.g., < 1 year, 3 years) and home ownership types (e.g., Rent, Own). The "annual_inc" column contains null values.

On the right side, the "Query Settings" pane is open, showing "PROPERTIES" for the "BorrowerDetails" query and "APPLIED STEPS" which include steps like "Capitalized Each Word in Ho...".

At the bottom, a status bar indicates "11 COLUMNS, 999+ ROWS" and "Column profiling based on top 1000 rows". A preview message "PREVIEW DOWNLOADED ON SUNDAY" is also visible.

20-Aug-24

V. Data Transformation

Objective: Transform the data to prepare it for analysis by changing data types, renaming columns, and creating new calculated columns.

a. Column Transformation

Steps:

- 💡 Change the data type of the 'total_pymnt' column in the "LoanDetails" table to 'Fixed decimal number':
- 💡 Right-click on 'total_pymnt' column → **Change Type** → **Fixed Decimal Number**.

Example:

The screenshot shows the Power Query Editor interface with the 'BorrowerDetails' and 'LoanDetails' queries selected. In the 'Applied Steps' pane, the 'Changed Type' step is highlighted, indicating the transformation of the 'total_pymnt' column from its original type to a 'Fixed decimal number'. The main table view shows the transformed data.

- 💡 Round off the 'funded_amnt' column to two decimal places:
- 💡 Use the **Round** function in Power Query or DAX.

Example:

The screenshot shows the Power Query Editor interface with the 'BorrowerDetails' and 'LoanDetails' queries selected. In the 'Applied Steps' pane, the 'Rounded Off 2 Decimal Places' step is highlighted, indicating the rounding of the 'funded_amnt' column. The main table view shows the rounded data.

b. Column Renaming

Steps:

- 💡 Rename 'issue_d' to 'issue_date' and 'last_pymnt_d' to 'last_pymnt_date':
- 💡 Right-click on the column name → **Rename**.

Example:

The screenshot shows the Power Query Editor interface with two queries: 'BorrowerDetails' and 'LoanDetails'. The 'LoanDetails' query is currently selected, displaying a table with columns: grade, A₁c_sub_grade, issue_date, A₁c_loan_status, and A₁c_purpose. The 'issue_date' column is highlighted. In the formula bar at the top, the formula is shown as = Table.RenameColumns(#"Rounded Off 2 Decimal Places", {"issue_d", "issue_date"}). The 'APPLIED STEPS' pane on the right lists the steps taken, including 'Renamed Column issue_date'.

The screenshot shows the Power Query Editor interface with two queries: 'BorrowerDetails' and 'LoanDetails'. The 'BorrowerDetails' query is currently selected, displaying a table with columns: ification_status, 12 dti, 123 delinq_2yrs, last_pymnt_date, and \$ total_pymt. The 'last_pymnt_date' column is highlighted. In the formula bar at the top, the formula is shown as = Table.RenameColumns(#"changed fixed decimal number", {"last_pymnt_d", "last_pymnt_date"}). The 'APPLIED STEPS' pane on the right lists the steps taken, including 'Renamed Column Last_pymnt...'.

c. Creating New Columns

- 💡 Create a new column named 'total_amount_paid':
- 💡 Formula: total_amount_paid = total_pymnt - out_prncp

Example:

The screenshot shows the Microsoft Power Query Editor interface. In the 'Applied Steps' pane on the right, there is a step labeled 'Added Custom Column "total_amount_paid"'. This indicates that a new column has been created. The main table view shows columns for 'mmt_date', 'total_pymnt', 'out_prncp', and the newly added 'total_amount_paid'. The data in the 'total_amount_paid' column is calculated as the difference between 'total_pymnt' and 'out_prncp' for each row.

- 💡 Create a new column named 'delinquency_status':
- 💡 Formula: if delinq_2yrs > 0 then "Delinquent" else "Not Delinquent"

Example:

This screenshot shows the Microsoft Power Query Editor with a similar setup to the previous one. The 'Applied Steps' pane shows a step for 'Filtered Rows2'. The main table now includes a new column 'delinquency_status' which uses an if-then-else formula based on the value of 'delinq_2yrs'. The formula is set to "Delinquent" if 'delinq_2yrs' is greater than 0, and "Not Delinquent" otherwise. The data in the 'delinquency_status' column reflects this logic across all rows.

d. Dropping Unnecessary Columns

- 💡 Remove the 'sub_grade' column as that does not significantly contribute to the analysis.
- 💡 Drop the 'sub_grade' column from the "LoanDetails" table:
- 💡 Right-click on 'sub_grade' column → **Remove**.

Example:

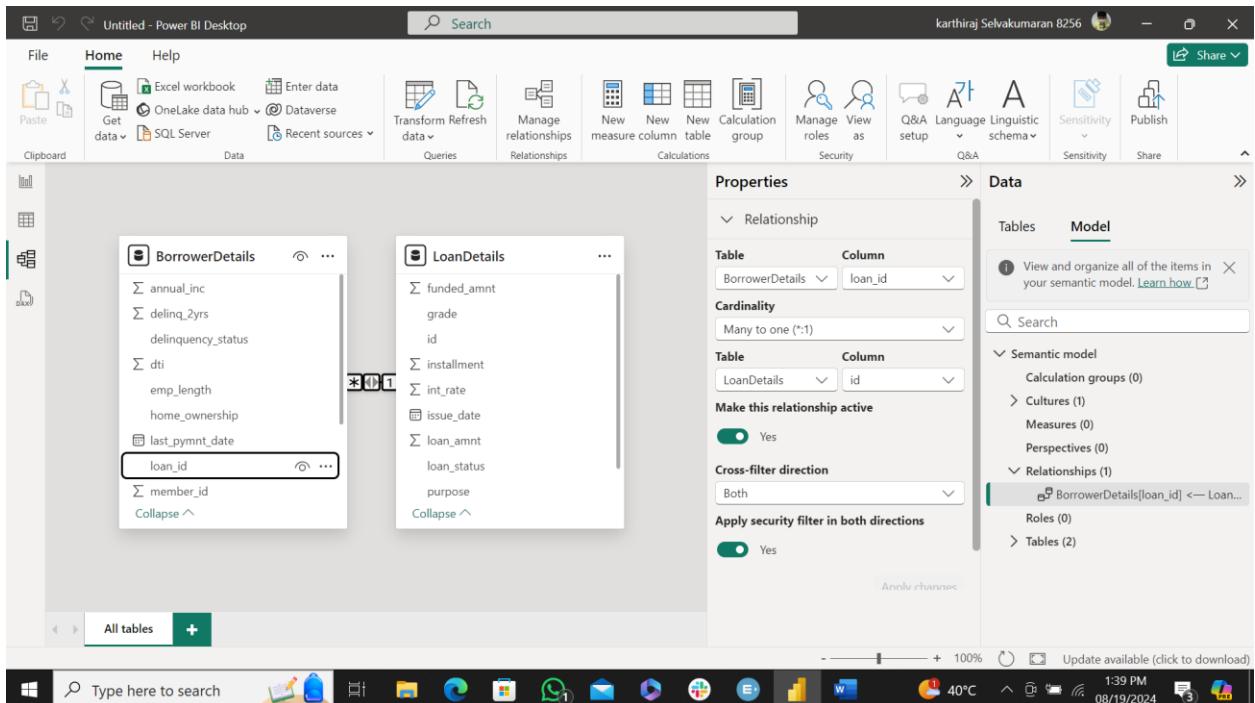
The screenshot shows the Microsoft Power Query Editor interface. The ribbon at the top includes File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The main area displays a table with columns: 'id', 'amount', 'grade', 'issue_date', 'loan_status', and 'purpose'. A tooltip above the 'grade' column indicates it has been renamed to 'sub_grade'. The 'Applied Steps' pane on the right shows the step 'Removed Sub_grade Column'.

	amount	grade	issue_date	loan_status	purpose
1	162.87	B	12/01/2018	Fully Paid	Credit Card
2	59.83	C	12/01/2018	Charged Off	Car
3	84.33	C	12/01/2018	Fully Paid	Small Business
4	339.31	C	12/01/2018	Fully Paid	Other
5	67.79	B	12/01/2018	Current	Other
6	156.46	A	12/01/2018	Fully Paid	Wedding
7	170.08	C	12/01/2018	Current	Debt Consolidation
8	109.43	E	12/01/2018	Fully Paid	Car
9	152.39	F	12/01/2018	Charged Off	Small Business
10	121.45	B	12/01/2018	Charged Off	Other
11	153.45	C	12/01/2018	Fully Paid	Debt Consolidation
12	402.54	B	12/01/2018	Fully Paid	Debt Consolidation
13	305.38	C	12/01/2018	Charged Off	Debt Consolidation
14	96.68	B	12/01/2018	Fully Paid	Credit Card
15	325.74	B	12/01/2018	Charged Off	Other
16	35.31	D	12/01/2018	Fully Paid	Debt Consolidation
17	347.98	C	12/01/2018	Fully Paid	Home Improvement
18	109.57	A	12/01/2018	Fully Paid	Major Purchase
19	198.46	B	12/01/2018	Fully Paid	Medical
20	280.01	A	12/01/2018	Fully Paid	Debt Consolidation
21	484.63	C	12/01/2018	Fully Paid	Debt Consolidation

VI. Data Modeling

Objective: Establish relationships between the "LoanDetails" and "BorrowerDetails" tables.

- 💡 Identify the common column ('id') between both tables.
- 💡 In the **Model** view, drag the 'id' column from "LoanDetails" to "BorrowerDetails" to create a relationship.
- 💡 Set the cross-filter direction to "Both" to ensure data flows in both directions.



VII. Creating Measures and Calculated Columns using DAX

Objective: Create DAX measures and calculated columns for deeper insights.

a. New Calculated Column Named Remaining Installments:

- >Create a new calculated column named 'remaining_installments' using DAX in the "BorrowerDetails" table to calculate the number of remaining installments by dividing the remaining principal amount ('out_prncp') by the monthly installment amount ('installment') and round up the result using the CEILING() function to account for any partial payments.

remaining_installments = CEILING(BorrowerDetails[out_prncp]/RELATED(LoanDetails[installment]),1)

b. New Measure Named: Non-Verified Borrowers Count:

- Create a measure named 'Non-Verified Borrowers Count' using DAX to count the number of loans that have been 'Not Verified'.

Non-Verified Borrowers Count = COUNTROWS(FILTER(BorrowerDetails, BorrowerDetails[verification_status] = "Not Verified"))

c. New Measure Named: Fully Paid Loan Percentage:

- 💡 Create a measure named 'Fully Paid Loan Percentage' to calculate the percentage of fully paid loans. Divide the number of loans with a "Fully Paid" loan status by the total number of loans and then format this measure as Percentage.

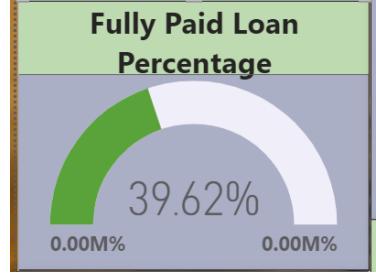
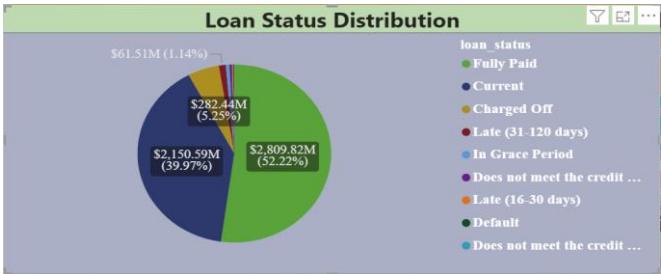
```
Fully Paid Loan Percentage = divide(COUNTROWS(FILTER(LoanDetails,
LoanDetails[loan_status]="Fully Paid")),COUNTA(LoanDetails[loan_status]))
```

The screenshot shows the Power BI Desktop interface. In the top navigation bar, 'Measure tools' is selected. A new measure named 'Fully Paid Loan Percentage' is being created, based on the formula provided in the code block above. The formula uses the 'divide' function to calculate the percentage of loans with a 'Fully Paid' status relative to the total number of loans. The preview card displays the calculated value as 39.621%. The Data pane on the right lists various columns from the 'LoanDetails' table, including 'loan_id', 'member_id', 'Non-Verified...', 'out_prncp', 'remaining_ins...', 'total_amount...', 'total_pymnt', and 'verification_st...'. The 'Fully Paid Loan Percentage' measure is also listed under the 'LoanDetails' table.

VIII. Data Analysis

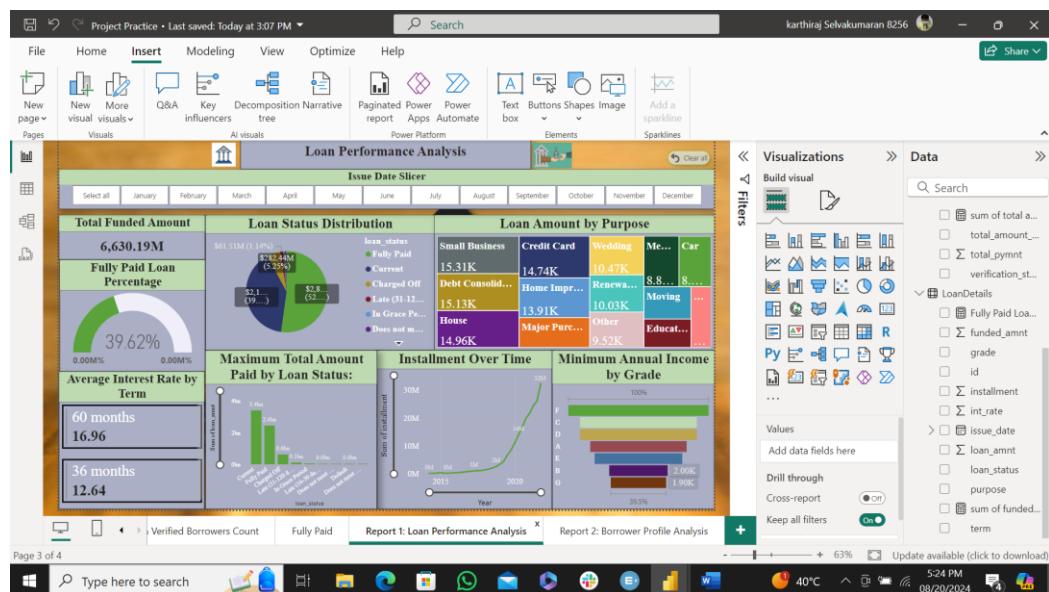
a. Loan Performance Analysis

💡 This section analyzes how various loan characteristics affect the overall loan performance.

Analysis	Chart Type	Findings
Total Funded Amount	Card Visual	The total funded amount across all loans is \$6,630.19M . 
Fully Paid Loan Percentage	Gauge Chart	The percentage of loans that are fully paid is 39.62% . 
Average Interest Rate by Term	Multi-Row Card	For 36-month terms, the average interest rate is 12.64% , and for 60-month terms, it's 16.96% . 
Loan Status Distribution	Pie Chart	52.22% of the loans are fully paid. 

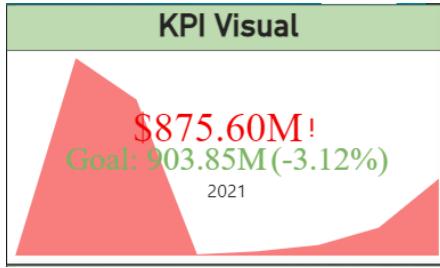
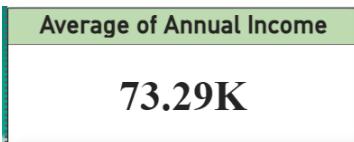
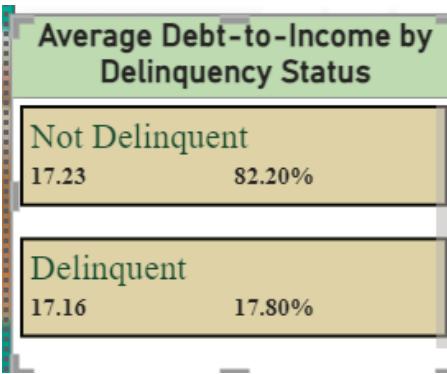
Analysis	Chart Type	Findings																														
Loan Amount by Purpose	Treemap	<p>The average loan amount for debt consolidation is \$15.13K, and for credit cards, it's \$14.74K.</p> <table border="1"> <thead> <tr> <th>Purpose</th> <th>Average Amount</th> </tr> </thead> <tbody> <tr> <td>Small Business</td> <td>15.31K</td> </tr> <tr> <td>Credit Card</td> <td>14.74K</td> </tr> <tr> <td>Wedding</td> <td>10.47K</td> </tr> <tr> <td>Medical</td> <td>8.85K</td> </tr> <tr> <td>Car</td> <td>8.12K</td> </tr> <tr> <td>Debt Consolidation</td> <td>15.13K</td> </tr> <tr> <td>Home Improvement</td> <td>13.91K</td> </tr> <tr> <td>Renewable Energy</td> <td>10.03K</td> </tr> <tr> <td>Moving</td> <td>7.54K</td> </tr> <tr> <td>Other</td> <td>9.52K</td> </tr> <tr> <td>Major Purchase</td> <td>10.49K</td> </tr> <tr> <td>Educational</td> <td>6.63K</td> </tr> <tr> <td>Vacation</td> <td>6.57K</td> </tr> <tr> <td>House</td> <td>14.96K</td> </tr> </tbody> </table>	Purpose	Average Amount	Small Business	15.31K	Credit Card	14.74K	Wedding	10.47K	Medical	8.85K	Car	8.12K	Debt Consolidation	15.13K	Home Improvement	13.91K	Renewable Energy	10.03K	Moving	7.54K	Other	9.52K	Major Purchase	10.49K	Educational	6.63K	Vacation	6.57K	House	14.96K
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Installment Over Time	Line Chart	<p>There is a significant increase in installments over time, rising from \$334,224,000 in 2015 Q1 to \$10,956,637.20 in 2020 Q4.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Sum of Installment</th> </tr> </thead> <tbody> <tr> <td>2015</td> <td>0.0M</td> </tr> <tr> <td>2016</td> <td>0.1M</td> </tr> <tr> <td>2017</td> <td>0.4M</td> </tr> <tr> <td>2018</td> <td>0.9M</td> </tr> <tr> <td>2019</td> <td>2.5M</td> </tr> <tr> <td>2020</td> <td>6.5M</td> </tr> <tr> <td>2021</td> <td>13.8M</td> </tr> <tr> <td>2022</td> <td>32.2M</td> </tr> </tbody> </table>	Year	Sum of Installment	2015	0.0M	2016	0.1M	2017	0.4M	2018	0.9M	2019	2.5M	2020	6.5M	2021	13.8M	2022	32.2M												
Year	Sum of Installment																															
2015	0.0M																															
2016	0.1M																															
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2022	32.2M																															
Max Total Amount Paid by Loan Status	Column Chart	<p>The maximum total amount paid for fully paid loans is \$2.4bn.</p> <table border="1"> <thead> <tr> <th>Loan Status</th> <th>Sum of loan_amnt</th> </tr> </thead> <tbody> <tr> <td>Current</td> <td>3.4bn</td> </tr> <tr> <td>Fully Paid</td> <td>2.4bn</td> </tr> <tr> <td>Charged Off</td> <td>0.6bn</td> </tr> <tr> <td>Late (31-120 days)</td> <td>0.1bn</td> </tr> <tr> <td>In Grace Period</td> <td>0.1bn</td> </tr> <tr> <td>Late (16-30 days)</td> <td>0.0bn</td> </tr> <tr> <td>Does not meet terms</td> <td>0.0bn</td> </tr> <tr> <td>Default</td> <td>0.0bn</td> </tr> <tr> <td>Does not meet terms</td> <td>0.0bn</td> </tr> </tbody> </table>	Loan Status	Sum of loan_amnt	Current	3.4bn	Fully Paid	2.4bn	Charged Off	0.6bn	Late (31-120 days)	0.1bn	In Grace Period	0.1bn	Late (16-30 days)	0.0bn	Does not meet terms	0.0bn	Default	0.0bn	Does not meet terms	0.0bn										
Loan Status	Sum of loan_amnt																															
Current	3.4bn																															
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Charged Off	0.6bn																															
Late (31-120 days)	0.1bn																															
In Grace Period	0.1bn																															
Late (16-30 days)	0.0bn																															
Does not meet terms	0.0bn																															
Default	0.0bn																															
Does not meet terms	0.0bn																															

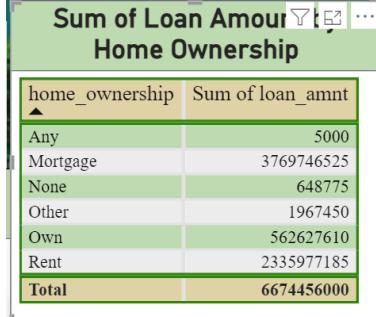
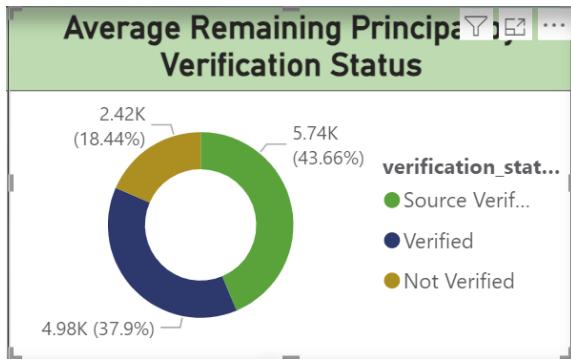
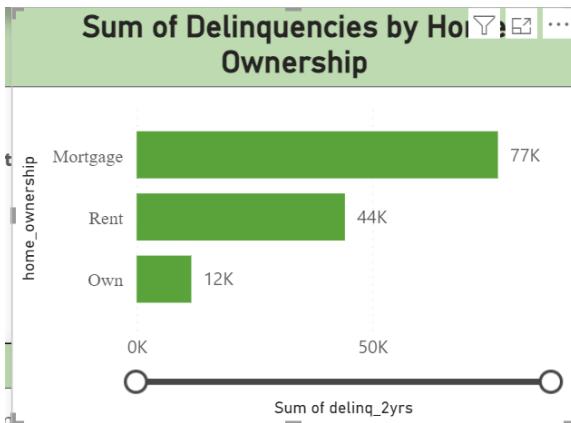
Analysis	Chart Type	Findings
Min Annual Income by Grade	Funnel Chart	The minimum annual income for Grade A loans is \$3.30K, and for Grade B, it's \$2.00K.
Issue Date Slicer:	Slicer	Allows filtering by Month of the issue date to enable dynamic data exploration.



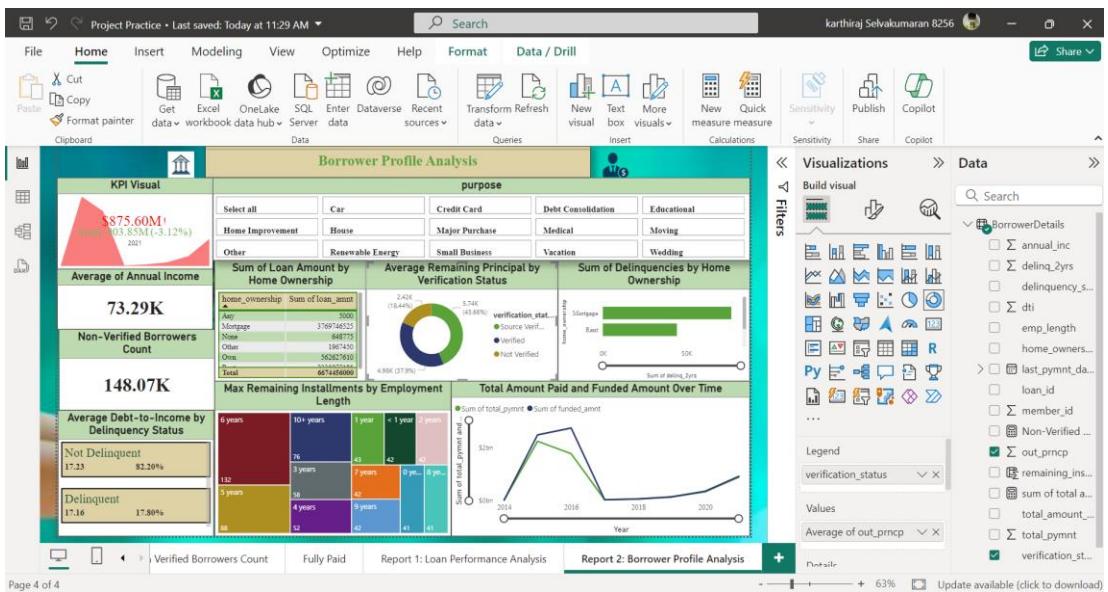
b. Borrower Profile Analysis

💡 This section focuses on analyzing borrower characteristics and their impact on loan repayment.

Analysis	Chart Type	Findings
Sum of Total Payment	KPI Visual	The sum of total payments across all borrowers is \$875.60M , with a target of \$903.85M .
		
Average Annual Income	Card Visual	The average annual income of borrowers is \$73.29K .
		
Non-Verified Borrowers Count	Card Visual	There are 148.07K borrowers whose income was not verified.
		
Average Debt-to-Income by Delinquency Status	Multi-Row Card	The average debt-to-income ratio is 17.80% for delinquent borrowers and 82.20% for non-delinquent borrowers.
		

Analysis	Chart Type	Findings																
Loan Amount by Home Ownership	Table	<p>The total loan amount for borrowers with mortgages is \$3,76,974,525, and for those renting, it's \$2,335,977,185.</p>  <table border="1"> <thead> <tr> <th>home_ownership</th> <th>Sum of loan_amnt</th> </tr> </thead> <tbody> <tr> <td>Any</td> <td>5000</td> </tr> <tr> <td>Mortgage</td> <td>3769746525</td> </tr> <tr> <td>None</td> <td>648775</td> </tr> <tr> <td>Other</td> <td>1967450</td> </tr> <tr> <td>Own</td> <td>562627610</td> </tr> <tr> <td>Rent</td> <td>2335977185</td> </tr> <tr> <td>Total</td> <td>6674456000</td> </tr> </tbody> </table>	home_ownership	Sum of loan_amnt	Any	5000	Mortgage	3769746525	None	648775	Other	1967450	Own	562627610	Rent	2335977185	Total	6674456000
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Total	6674456000																	
Avg. Remaining Principal by Verification Status	Donut Chart	<p>Verified borrowers have an average remaining principal of \$4.98K, while non-verified borrowers have \$2.42K.</p>  <table border="1"> <thead> <tr> <th>verification_status</th> <th>Avg. Remaining Principal</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Source Verified</td> <td>4.98K</td> <td>(37.9%)</td> </tr> <tr> <td>Verified</td> <td>5.74K</td> <td>(43.66%)</td> </tr> <tr> <td>Not Verified</td> <td>2.42K</td> <td>(18.44%)</td> </tr> </tbody> </table>	verification_status	Avg. Remaining Principal	Percentage	Source Verified	4.98K	(37.9%)	Verified	5.74K	(43.66%)	Not Verified	2.42K	(18.44%)				
verification_status	Avg. Remaining Principal	Percentage																
Source Verified	4.98K	(37.9%)																
Verified	5.74K	(43.66%)																
Not Verified	2.42K	(18.44%)																
Delinquencies by Home Ownership	Bar Chart	<p>Mortgage borrowers have 77K delinquencies, renters have 44K, and homeowners have 12K.</p>  <table border="1"> <thead> <tr> <th>home_ownership</th> <th>Sum of delinq_2yrs</th> </tr> </thead> <tbody> <tr> <td>Mortgage</td> <td>77K</td> </tr> <tr> <td>Rent</td> <td>44K</td> </tr> <tr> <td>Own</td> <td>12K</td> </tr> <tr> <td>0K</td> <td>50K</td> </tr> </tbody> </table>	home_ownership	Sum of delinq_2yrs	Mortgage	77K	Rent	44K	Own	12K	0K	50K						
home_ownership	Sum of delinq_2yrs																	
Mortgage	77K																	
Rent	44K																	
Own	12K																	
0K	50K																	

Analysis	Chart Type	Findings
Max Remaining Installments by Employment Length	Treemap	<p>Borrowers with 1-5 years of employment have a maximum of 40 remaining installments.</p>
Total Amount Paid and Funded Amount Over Time	Line/Stacked Column Chart	<p>The total amount paid and funded amount have both increased steadily over time.</p>
Purpose Slicer	Slicer	<p>slicer for loan purpose to enable dynamic data exploration</p>



IX. Summary and Key Insights

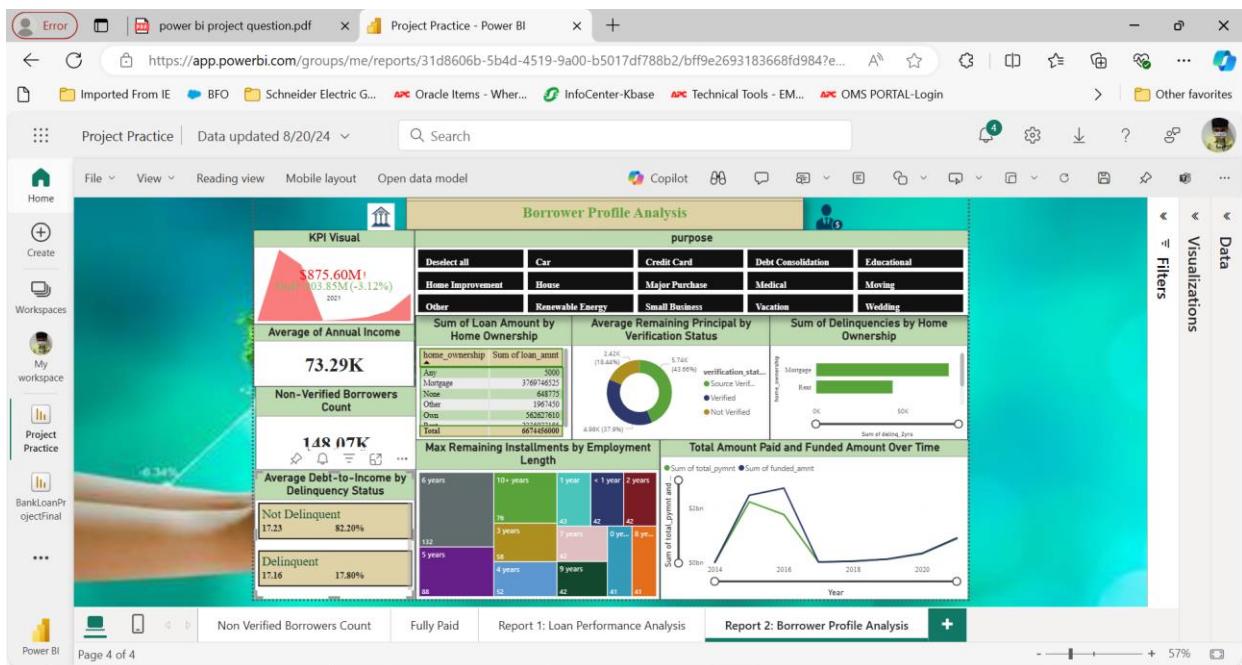
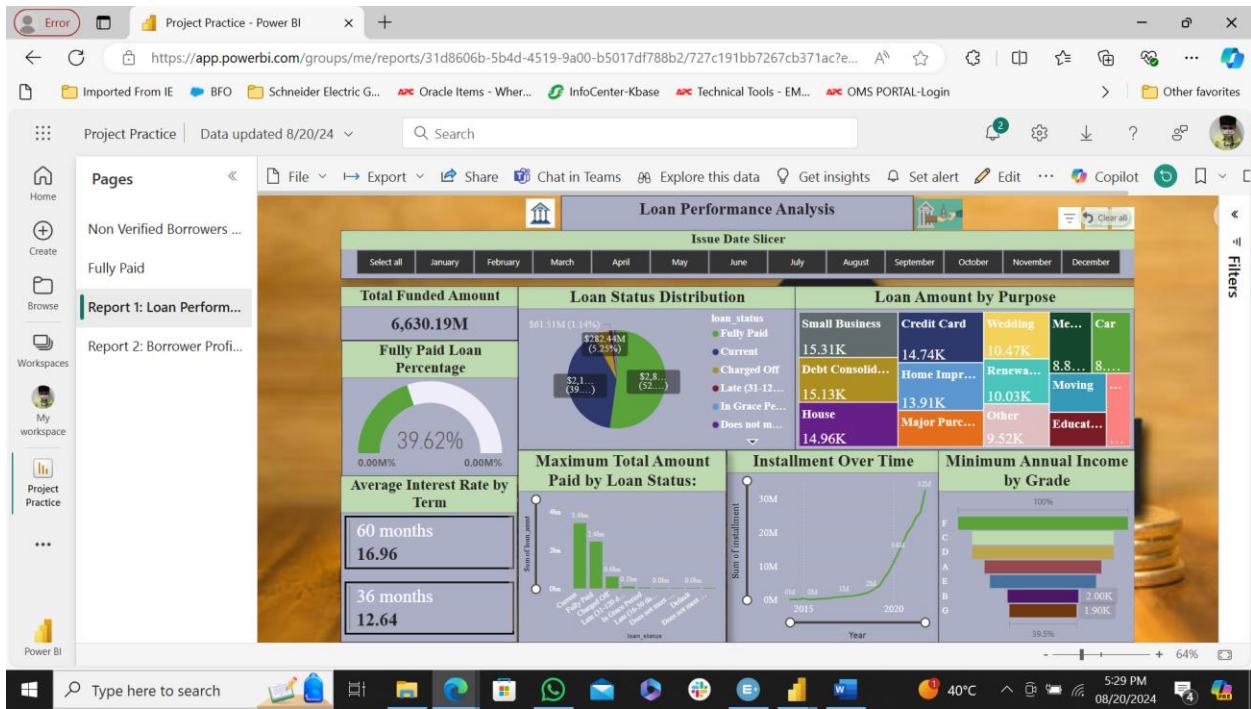
- Summary:**
 - Loan Performance Analysis:**
 - The analysis aimed to understand loan performance by examining key metrics such as funded amounts, loan statuses, and payment behaviors. The data was cleaned and transformed, and DAX measures were used to derive key performance indicators.
 - Borrower Profile Analysis:**
 - This analysis focused on borrower profiles, identifying trends in income levels, verification statuses, and delinquency rates. The "BorrowerDetails" data was meticulously cleaned and transformed to ensure accurate insights.

- b. Key Insights:
 - i. Loan Performance Analysis:
 - 💡 **High Percentage of Fully Paid Loans:** 40% of the loans are fully paid, indicating effective lending strategies.
 - 💡 **Loan Amounts vs. Loan Status:** Higher loan amounts correlate with higher delinquency rates.
 - 💡 **Installment Trends:** Lower installment amounts lead to better loan performance.
 - ii. Borrower Profile Analysis:
 - 💡 **Income Disparities:** Lower-income borrowers are more prone to default.
 - 💡 **Non-Verified Borrowers:** A higher delinquency rate is observed among non-verified borrowers.
 - 💡 **Home Ownership:** Borrowers who own homes are more likely to repay their loans fully.

X. Publishing the Dashboard

1. Sign in to Power BI Service:
 - 💡 Make sure you're signed into your Power BI account.
2. Publish the Report:
 - 💡 Go to the Home tab and click Publish.
 - 💡 Choose the workspace where you want to publish the report. If you don't have a specific workspace, you can publish it to "My Workspace".
3. Access the Dashboard Online:
 - 💡 After publishing, go to the Power BI Service (app.powerbi.com) and navigate to the chosen workspace to view your report.

Bank Loan Performance Analysis



20-Aug-24

XI. Conclusion

This analysis reveals that both loan characteristics and borrower profiles significantly impact loan performance. Banking institutions can leverage these insights to refine their lending strategies, improve risk management, and enhance overall portfolio health.

XII. Appendix

- ❑ **Data Sources:** Provide details on the dataset and its source.
- ❑ **Data Dictionary:** Include a brief description of key columns used in the analysis.
- ❑ **Methodology:** Outline the steps taken for data cleaning, transformation, and analysis.