

Project Title: Bank Loan Performance Analysis

Problem Statement:

In today's data-driven world, understanding how borrower details and loan characteristics impact loan performance is very important for banking institutions. This project seeks to delve deep into a lending loan dataset to uncover the relationship between borrower behavior (such as employment length, income, and debt-to-income ratio) and loan characteristics (including amount, term, and interest rate) to unearth critical insights into loan performance metrics. By examining patterns in loan statuses such as fully paid, charged off, or late payments, this analysis aims to empower banking institutions with actionable insights to optimize loan lending strategies, mitigate credit risk, and enhance overall portfolio performance.

Project Steps and Objectives:

1) Importing Data

- Import the "LoanDetails" and "BorrowerDetails" sheets from the "bank loan.xlsx" file into Power BI.

The screenshot shows the Power Query Editor interface with the 'BorrowerDetails' query selected. The 'Transform' tab is active. In the main area, a table is displayed with columns: member_id, loan_id, emp_length, home_ownership, and annual_inc. The 'emp_length' column has a dropdown menu open, showing 'Data Type: Decimal Number' as the current selection. The 'Properties' pane on the right shows the 'Name' is set to 'BorrowerDetails'. The 'Applied Steps' pane at the bottom shows the last step taken was 'Changed Type'.

2) Transformation Using Power Query

Data Cleaning:

Handling Missing Values and Duplicates:

- Replace missing values (null) in the 'emp_length' column of the "BorrowerDetails" table with '0 year'.

Emp_length (null values change to 0 year by replace values option

Power Query Editor Screenshot showing the transformation of the 'emp_length' column. The formula bar displays the code: = Table.ReplaceValue(#"Changed Type", null, "0 year", Replacer.ReplaceValue, {"emp_length"}). The table preview shows 21 rows of data with the 'emp_length' column now containing '0 year' for all null values.

- Remove rows with missing values in the 'last_pymnt_d' and 'delinq_2yrs' columns.

Power Query Editor Screenshot showing the removal of rows with missing values in the 'last_pymnt_d' and 'delinq_2yrs' columns. The formula bar displays the code: = Table.SelectRows(#"last_pymnt_d(null and blank value)", each [delinq_2yrs] <> null and [delinq_2yrs]). The table preview shows 21 rows of data with rows containing null or blank values in either column removed.

- Remove duplicate rows in the 'id' column of the "LoanDetails" table.

Power Query Editor window showing the 'LoanDetails' table. The table contains 21 rows of data. The columns are: id, loan_amnt, funded_amnt, term, and int_rate. A formula bar at the top of the editor shows the command = Table.Distinct(#"Changed Type", {"id"}). The 'APPLIED STEPS' pane on the right side of the interface lists the step 'Removed Duplicates'.

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 window showing the 'LoanDetails' table. The table contains 21 rows of data. The columns are: grade, sub_grade, issue_d, loan_status, and purpose. A formula bar at the top of the editor shows the command = Table.ReplaceValue(#"Removed Duplicates", "_", " ", Replacer.ReplaceText, {"purpose"}). The 'APPLIED STEPS' pane on the right side of the interface lists the step 'Replaced Value _ by space'.

- Format the 'purpose' and 'home_ownership' columns to proper case.

Purpose column format by Capitalize each word

The screenshot shows the Power Query Editor interface with the 'Transform' tab selected. In the 'Applied Steps' pane, a step named 'Capitalized Each Word' is highlighted. The preview pane shows a table with columns: 'id', 'loan_amnt', 'funded_amnt', 'term', and 'int_rate'. The 'purpose' column has been transformed to proper case. The 'Properties' pane shows the query name is 'LoanDetails'.

i ² 3 id	\$ loan_amnt	\$ funded_amnt	% term	% int_rate
1	1077501	5,000.00	4,975.00 36 months	1C
2	1077430	2,500.00	2,500.00 60 months	15
3	1077175	2,400.00	2,400.00 36 months	15
4	1076863	10,000.00	10,000.00 36 months	13
5	1075358	3,000.00	3,000.00 60 months	12
6	1075269	5,000.00	5,000.00 36 months	1C
7	1069639	7,000.00	7,000.00 60 months	15
8	1072053	3,000.00	3,000.00 36 months	18
9	1071795	5,600.00	5,600.00 60 months	21
10	1071570	5,375.00	5,350.00 60 months	12
11	1070078	6,500.00	6,500.00 60 months	14
12	1069908	12,000.00	12,000.00 36 months	12
13	1064687	9,000.00	9,000.00 36 months	13
14	1069866	3,000.00	3,000.00 36 months	5
15	1069057	10,000.00	10,000.00 36 months	1C
16	1069759	1,000.00	1,000.00 36 months	16
17	1065775	10,000.00	10,000.00 36 months	15
18	1069971	3,600.00	3,600.00 36 months	6
19	1062474	6,000.00	6,000.00 36 months	11
20	1069742	9,200.00	9,200.00 36 months	1C
21				

Home_ownership column format by Capitalize each word

The screenshot shows the Power Query Editor interface with the 'Transform' tab selected. In the 'Applied Steps' pane, a step named 'Capitalized Each Word' is highlighted. The preview pane shows a table with columns: 'member_id', 'loan_id', 'emp_length', 'home_ownership', and 'annual_inc'. The 'home_ownership' column has been transformed to proper case. The 'Properties' pane shows the query name is 'BorrowerDetails'.

i ² 3 member_id	i ² 3 loan_id	#P _C emp_length	#P _C home_ownership	1.2 annual_inc
1	1296599	1077501 10+ years	Rent	24i
2	1314167	1077430 < 1 year	Rent	30i
3	1313524	1077175 10+ years	Rent	12
4	1277178	1076863 10+ years	Rent	49
5	1311748	1075358 1 year	Rent	80
6	1311441	1075269 3 years	Rent	36
7	1304742	1069639 8 years	Rent	47
8	1288686	1072053 9 years	Rent	48
9	1306957	1071795 4 years	Own	40
10	1306721	1071570 < 1 year	Rent	15i
11	1305201	1070078 5 years	Own	72
12	1305008	1069908 10+ years	Own	75i
13	1298717	1064687 < 1 year	Rent	30
14	1304956	1069866 3 years	Rent	15i
15	1303503	1069057 3 years	Rent	100
16	1304871	1069759 < 1 year	Rent	28
17	1299699	1065775 4 years	Rent	42i
18	1304884	1069971 10+ years	Mortgage	110
19	1294539	1062474 1 year	Mortgage	84i
20	1304855	1069742 6 years	Rent	77385
21				

Data Transformation:

Column Transformation:

- Change the data type of the 'total_pymnt' column to 'Fixed decimal number'.

The screenshot shows the Power Query Editor interface with the 'Transform' tab selected. In the 'Applied Steps' pane, a step named 'Changed Type1' is highlighted, showing the transformation from 'Text' to 'Fixed decimal number'. The main table view displays a sample of 21 rows from the 'BorrowerDetails' query, with the 'total_pymnt' column now showing numerical values like 5,861.07 and 1,008.71.

	1.2 dti	1.2 deling_2yrs	1.2 last_pymnt_d	\$ total_pymnt	1.2 out_prncp
1	27.65	0	01-01-2015	5,861.07	
2	1	0	01-04-2020	1,008.71	
3	8.72	0	01-06-2021	3,003.65	
4	20	0	01-01-2015	12,226.30	
5	17.94	0	01-01-2016	3,242.17	
6	11.2	0	01-01-2015	5,631.38	
7	23.51	0	01-01-2016	8,136.84	186
8	5.35	0	01-01-2015	3,938.14	
9	5.55	0	01-04-2019	646.02	
10	18.08	0	01-11-2019	1,476.19	
11	16.12	0	01-06-2020	7,677.52	
12	10.78	0	01-09-2020	13,943.08	
13	10.08	0	01-07-2019	2,270.70	
14	12.56	0	01-01-2015	3,478.98	
15	7.06	0	01-10-2020	7,471.99	
16	20.31	0	01-01-2015	1,270.17	
17	18.6	0	01-01-2015	12,519.26	
18	10.52	0	01-05-2020	3,785.02	
19	18.44	2	01-02-2015	7,164.50	
20	9.86	0	01-07-2019	9,459.96	
21	--	--	--	--	--

- Round off the numbers in the 'funded_amnt' column to 2 decimal places.

The screenshot shows the Power Query Editor interface with the 'Transform' tab selected. In the 'Applied Steps' pane, a step named 'Rounded Off' is highlighted, showing the use of the 'Number.Round' function. The main table view displays a sample of 21 rows from the 'LoanDetails' query, with the 'funded_amnt' column values rounded to two decimal places, such as 5,000.00 and 4,975.00.

	1.2 id	\$ loan_amnt	\$ funded_amnt	2.2 term	2.2 int_rate
1	1077501	5,000.00	4,975.00	36 months	1%
2	1077430	2,500.00	2,500.00	60 months	15%
3	1077175	2,400.00	2,400.00	36 months	15%
4	1076863	10,000.00	10,000.00	36 months	13%
5	1075358	3,000.00	3,000.00	60 months	12%
6	1075269	5,000.00	5,000.00	36 months	15%
7	1069639	7,000.00	7,000.00	60 months	15%
8	1072053	3,000.00	3,000.00	36 months	18%
9	1071795	5,600.00	5,600.00	60 months	21%
10	1071570	5,375.00	5,350.00	60 months	12%
11	1070078	6,500.00	6,500.00	60 months	14%
12	1069908	12,000.00	12,000.00	36 months	12%
13	1064687	9,000.00	9,000.00	36 months	13%
14	1069866	3,000.00	3,000.00	36 months	5%
15	1069057	10,000.00	10,000.00	36 months	16%
16	1069759	1,000.00	1,000.00	36 months	16%
17	1065775	10,000.00	10,000.00	36 months	15%
18	1069971	3,600.00	3,600.00	36 months	6%
19	1062474	6,000.00	6,000.00	36 months	11%
20	1069742	9,200.00	9,200.00	36 months	6%
21	--	--	--	--	--

Column Renaming:

➤ Rename the column 'issue_d' to 'issue_date'.

The screenshot shows the Power Query Editor interface with the 'Home' tab selected. In the 'Applied Steps' pane on the right, the 'Renamed Columns' step is highlighted. The query formula bar at the top shows the command: `= Table.RenameColumns(#"Rounded Off", {"issue_d", "issue_date"})`. The main table preview shows the 'issue_d' column being renamed to 'issue_date'. The table contains 21 rows of loan details, including columns like 'grade', 'sub_grade', 'issue_date', 'loan_status', and 'purpose'.

➤ Rename the column 'last_pymnt_d' to 'last_pymnt_date'.

The screenshot shows the Power Query Editor interface with the 'Home' tab selected. In the 'Applied Steps' pane on the right, the 'Renamed Columns' step is highlighted. The query formula bar at the top shows the command: `= Table.RenameColumns(#"Changed Type1", {"last_pymnt_d", "last_pymnt_date"})`. The main table preview shows the 'last_pymnt_d' column being renamed to 'last_pymnt_date'. The table contains 21 rows of borrower details, including columns like 'dti', 'delinq_2yrs', 'last_pymnt_date', 'total_pymnt', and 'out_prncp'.

Creating New Columns:

- Create a new custom column named 'total_amount_paid' to calculate the total amount paid by each borrower by subtracting 'out_prncp' from 'total_pymnt'.

Queries [2]

= Table.TransformColumnTypes(total_amount_paid,{{"total_amount_paid", currency.Type}})

	delinq_2yrs	last_pymnt_date	\$ total_pymnt	1.2 out_prncp	\$ total_amount_paid
1	0	01-01-2015	5,861.07	0	5,861.07
2	0	01-04-2020	1,008.71	0	1,008.71
3	0	01-06-2021	3,003.65	0	3,003.65
4	0	01-01-2015	12,226.30	0	12,226.30
5	0	01-01-2016	3,242.17	766.9	2,475.27
6	0	01-01-2015	5,631.38	0	5,631.38
7	0	01-01-2016	8,136.84	1889.15	6,247.69
8	0	01-01-2015	3,938.14	0	3,938.14
9	0	01-04-2019	646.02	0	646.02
10	0	01-11-2019	1,476.19	0	1,476.19
11	0	01-06-2020	7,677.52	0	7,677.52
12	0	01-09-2020	13,943.08	0	13,943.08
13	0	01-07-2019	2,270.70	0	2,270.70
14	0	01-01-2015	3,478.98	0	3,478.98
15	0	01-10-2020	7,471.99	0	7,471.99
16	0	01-01-2015	1,270.17	0	1,270.17
17	0	01-01-2015	12,519.26	0	12,519.26
18	0	01-05-2020	3,785.02	0	3,785.02
19	2	01-02-2015	7,164.50	0	7,164.50
20	0	01-07-2019	9,459.96	0	9,459.96
21					

12 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

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- Add a new conditional column named 'delinquency_status' to identify if the borrower has any delinquencies. If the number of delinquencies in 'delinq_2yrs' is greater than 0, the status should be "Delinquent", otherwise "Not Delinquent".

Queries [2]

= Table.AddColumn(#"Changed Type2", "delinquency_status", each if [delinq_2yrs] > 0 then "Delinquent" else "Not Delinquent")

	last_pymnt_date	\$ total_pymnt	1.2 out_prncp	\$ total_amount_paid	delinquency_status
1	01-01-2015	5,861.07	0	5,861.07	Not Delinquent
2	01-04-2020	1,008.71	0	1,008.71	Not Delinquent
3	01-06-2021	3,003.65	0	3,003.65	Not Delinquent
4	01-01-2015	12,226.30	0	12,226.30	Not Delinquent
5	01-01-2016	3,242.17	766.9	2,475.27	Not Delinquent
6	01-01-2015	5,631.38	0	5,631.38	Not Delinquent
7	01-01-2016	8,136.84	1889.15	6,247.69	Not Delinquent
8	01-01-2015	3,938.14	0	3,938.14	Not Delinquent
9	01-04-2019	646.02	0	646.02	Not Delinquent
10	01-11-2019	1,476.19	0	1,476.19	Not Delinquent
11	01-06-2020	7,677.52	0	7,677.52	Not Delinquent
12	01-09-2020	13,943.08	0	13,943.08	Not Delinquent
13	01-07-2019	2,270.70	0	2,270.70	Not Delinquent
14	01-01-2015	3,478.98	0	3,478.98	Not Delinquent
15	01-10-2020	7,471.99	0	7,471.99	Not Delinquent
16	01-01-2015	1,270.17	0	1,270.17	Not Delinquent
17	01-01-2015	12,519.26	0	12,519.26	Not Delinquent
18	01-05-2020	3,785.02	0	3,785.02	Not Delinquent
19	01-02-2015	7,164.50	0	7,164.50	Delinquent
20	01-07-2019	9,459.96	0	9,459.96	Not Delinquent
21					

13 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

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Column Dropping:

- Remove the 'sub_grade' column as that does not significantly contribute to the analysis.

The screenshot shows the Power Query Editor interface with the following details:

- File** tab selected.
- Transform** ribbon tab selected.
- Queries [2]**:
 - LoanDetails**: Contains columns: installment, sub_grade, issue_date, loan_status, purpose.
 - BorrowerDetails**: Contains columns: installment, sub_grade, issue_date, loan_status, purpose.
- Applied Steps** pane:
 - Removed Columns (highlighted)
 - Source
 - Navigation
 - Promoted Headers
 - Changed Type
 - Removed Duplicates
 - Replaced Value _ by space
 - Capitalized Each Word
 - Rounded Off
 - Renamed Columns
- Properties** pane: Name is set to LoanDetails.
- Preview**: Shows the top 1000 rows of the data.

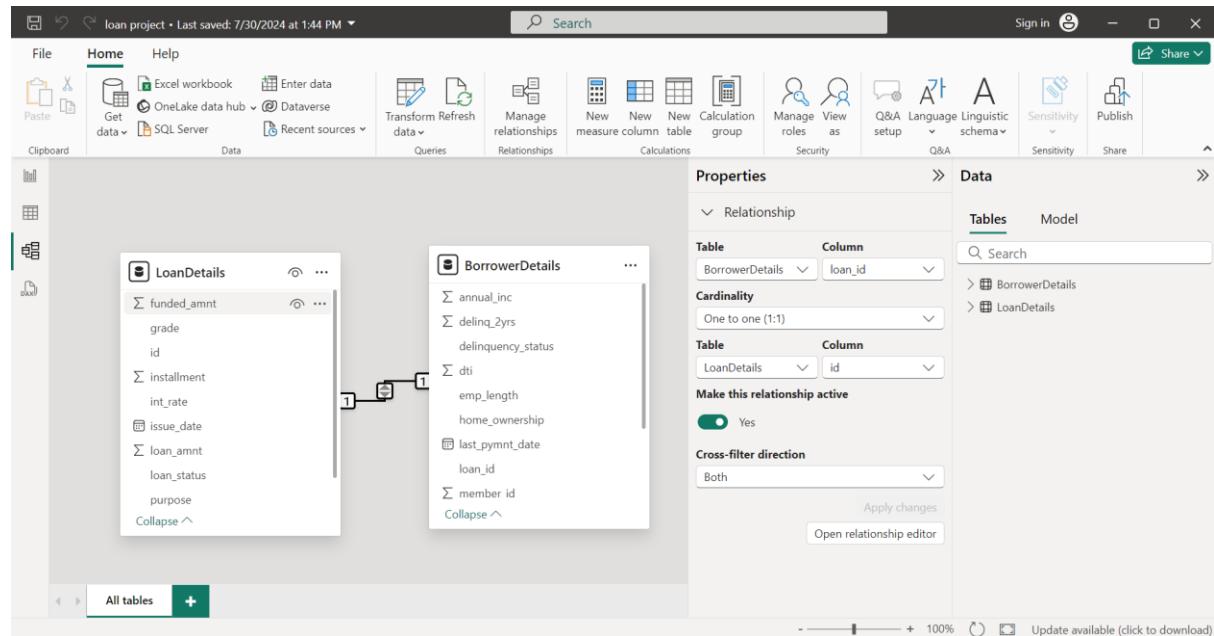
The code in the formula bar is: `= Table.RemoveColumns("Renamed Columns", {"sub_grade"})`

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

3) Data Modeling

➤ Identify the common column between both the tables and establish relationships between the two tables. Ensure the cross-filter direction is set to "Both". This step is crucial for enabling cross-table analysis and ensuring data integrity within the dataset.

id and loan_id has the relationship between the two tables



4) Creating Measures and Calculated Columns using DAX

➤ 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.

The screenshot shows the Power BI Desktop interface with the 'Table tools' tab selected. In the 'Structure' pane, a new column 'remaining_installments' is being defined with the DAX formula: `CEILING(BorrowerDetails[out_prncp] / RELATED(LoanDetails[installment]), 1)`. The 'Format' dropdown is set to 'Currency'. The 'Data type' is 'Whole number'. The 'Summarization' dropdown is set to 'Sum'. The 'Data category' is 'Uncategorized'. The 'Properties' pane shows the column's name and data type. The main data grid displays rows of data from the BorrowerDetails table, including columns like 'cation_status', 'dti', 'delinq_2yrs', 'last_pymnt_date', 'total_pymnt', 'out_prncp', 'total_amount_paid', 'delinquency_status', and the newly created 'remaining_installments' column. The 'Data' pane on the right lists various measures and columns, including 'remaining_installments' which is highlighted.

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

The screenshot shows the Power BI Desktop interface with the 'Measure tools' tab selected. A new measure 'Non-Verified Borrowers Count' is being defined with the DAX formula: `COUNTROWS(FILTER(BorrowerDetails, BorrowerDetails[verification_status] = "Not Verified"))`. The 'Format' dropdown is set to 'Whole number'. The 'Home table' is set to 'BorrowerDetails'. The 'Data category' is 'Uncategorized'. The 'Properties' pane shows the measure's name and data type. The main data grid displays rows of data from the BorrowerDetails table, including columns like 'member_id', 'loan_id', 'emp_length', 'home_ownership', 'annual_inc', 'verification_status', 'dti', 'delinq_2yrs', 'last_pymnt_date', 'total_pymnt', and the newly created 'Non-Verified Borrowers Count' measure. The 'Data' pane on the right lists various measures and columns, including 'Non-Verified Borrowers Count' which is highlighted.

- 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.

The screenshot shows the Power BI desktop interface with the 'Table tools' tab selected. A new measure named 'Fully Paid Loan Percentage' is being created. The formula is:

```
1 Fully Paid Loan Percentage = DIVIDE(CALCULATE(COUNTROWS(LoanDetails), LoanDetails[loan_status] = "Fully Paid"), COUNTROWS(LoanDetails))
```

The measure is formatted as a percentage. The table view shows several rows of loan data. On the right, the 'Quick measure' pane lists various measures and their components, including the newly created 'Fully Paid Loan Percentage'.

5) Creating Comprehensive Reports

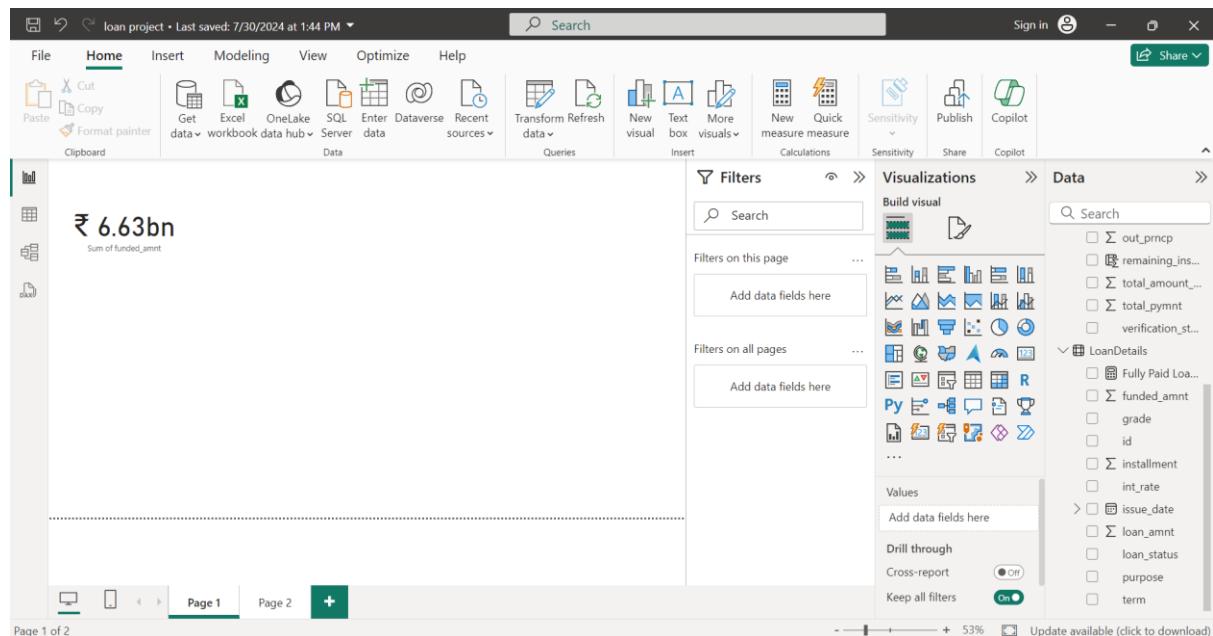
General Instructions for Report:

- Create two insightful reports:
 - ★ ***Report 1: Loan Performance Analysis***
 - ★ ***Report 2: Borrower Profile Analysis***
- Ensure each report and its charts are titled appropriately for easy identification.
- Maintain a clean and professional layout throughout both reports.
- Format and customize the charts to enhance visual appeal and comprehension.
- Utilize slicers for dynamic data exploration and filtering.
- Add tooltips to provide additional context and details for data points when hovered over.
- Include a summary or key insights section in each report to highlight main findings and observations.

Report 1: Loan Performance Analysis

The Loan Performance Analysis report aims to provide insights into the performance of loans based on various factors such as loan amount, loan status, term, interest rate, and purpose.

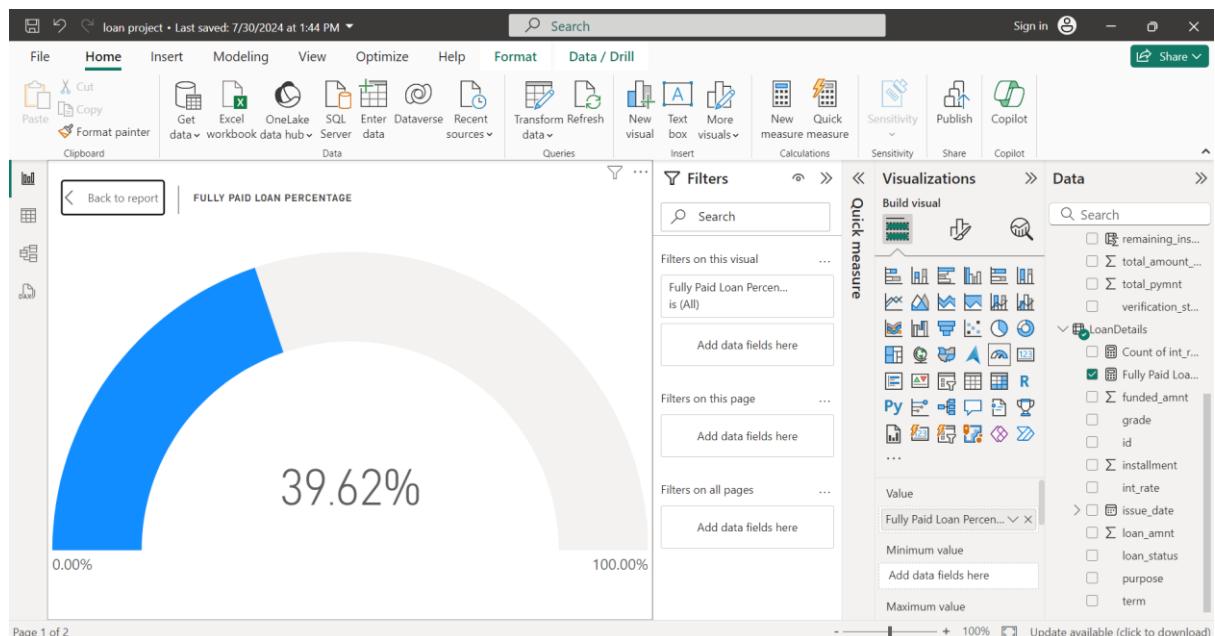
➤ **Total Funded Amount:** Create a card visual to display the total funded amount.



The screenshot shows the Power BI desktop interface with the following details:

- File**, **Home** (selected), **Insert**, **Modeling**, **View**, **Optimize**, **Help** menu bar.
- Clipboard** ribbon tab.
- Data** ribbon tab.
- Queries** ribbon tab.
- Insert** ribbon tab.
- Visualizations** ribbon tab.
- Data** ribbon tab.
- Filters** pane: "Filters on this page" section with "Add data fields here".
- Visualizations** pane: "Build visual" section with various chart icons.
- Data** pane: "Search" field, "Values" section with "Add data fields here", "Drill through", "Cross-report", and "Keep all filters" buttons.
- Card Visual Content:** A card visual displays the value "₹ 6.63bn" with the subtitle "Sum of funded_amnt".
- Page Navigation:** "Page 1" (selected) and "Page 2" buttons.
- Page Footer:** "Page 1 of 2", "53%", "Update available (click to download)".

➤ **Fully Paid Loan Percentage:** Create a gauge chart to display the 'Fully Paid Loan Percentage' measure.



The screenshot shows the Power BI desktop interface with the following details:

- File**, **Home** (selected), **Insert**, **Modeling**, **View**, **Optimize**, **Help** menu bar.
- Format** ribbon tab.
- Data / Drill** ribbon tab.
- Clipboard** ribbon tab.
- Data** ribbon tab.
- Queries** ribbon tab.
- Insert** ribbon tab.
- Visualizations** ribbon tab.
- Data** ribbon tab.
- Filters** pane: "Filters on this visual" section with "Fully Paid Loan Percen... is (All)" and "Add data fields here".
- Visualizations** pane: "Build visual" section with various chart icons.
- Data** pane: "Search" field, "Value" section with "Fully Paid Loan Percen... X", "Minimum value", "Add data fields here", and "Maximum value".
- Gauge Chart Content:** A gauge chart titled "FULLY PAID LOAN PERCENTAGE" shows the value "39.62%" with scale markers at "0.00%" and "100.00%".
- Page Navigation:** "Back to report" button and "Page 1 of 2" button.
- Page Footer:** "100%", "Update available (click to download)".

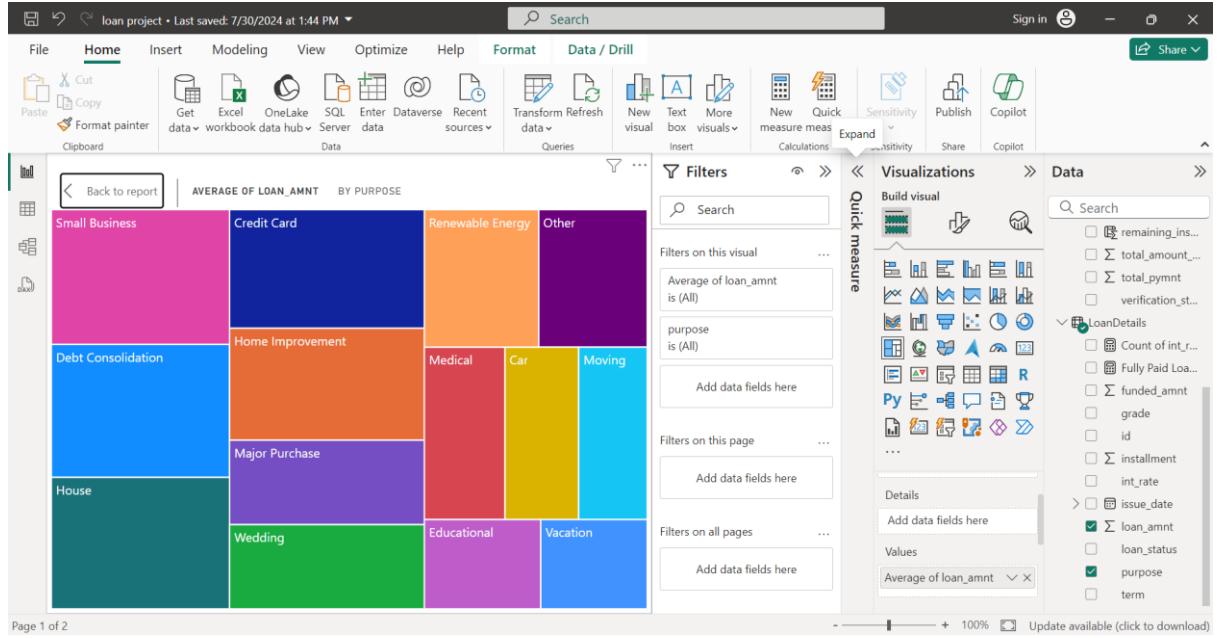
➤ **Average Interest Rate by Term:** Create a multi-row card to show the average interest rate for each term.

The screenshot shows a Power BI report titled "loan project". The ribbon is visible with tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. On the left, there's a card with three rows of data: "60 months" with value "₹ 19,770.3845" and "Average of funded_amnt"; "36 months" with value "₹ 12,115.489" and "Average of funded_amnt"; and "36 months" with value "36 months". The right side of the screen displays the Power BI visualizations pane, which includes sections for Filters, Visualizations, and Data. The Data section shows a list of fields such as "remaining_ins...", "total_amount_...", "total_pymnt", "verification_st...", "funded_amnt", "grade", "id", "installment", "int_rate", "issue_date", "loan_amnt", "loan_status", "purpose", and "term". The "term" field is checked under the "Fields" section.

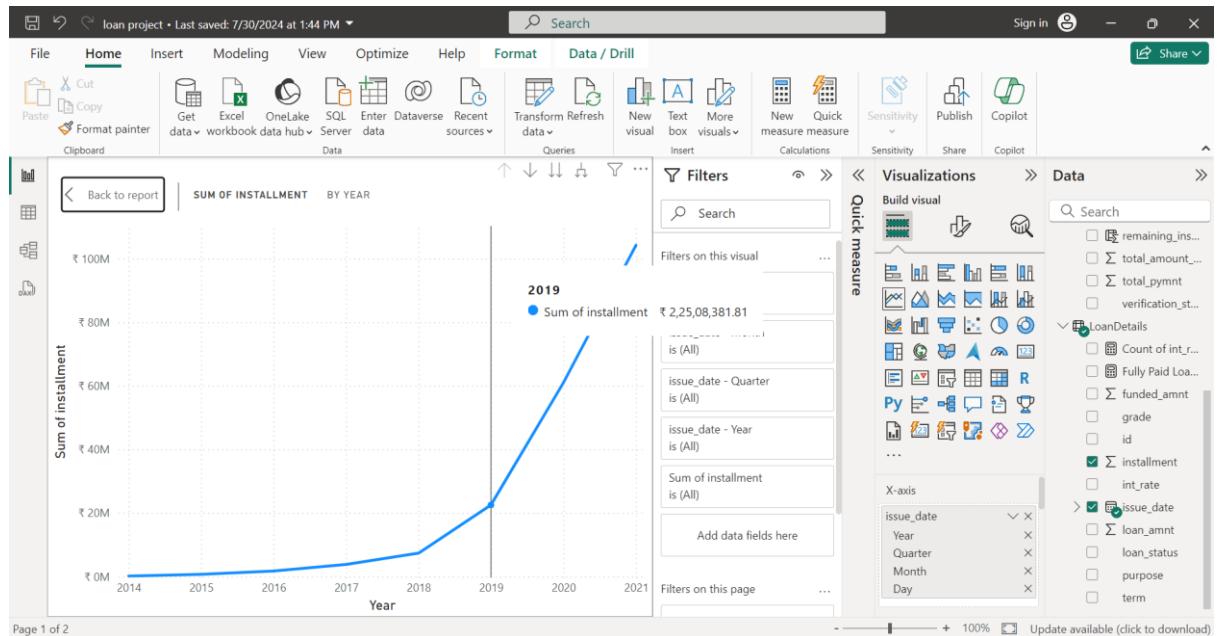
➤ **Loan Status Distribution:** Create a pie chart to visualize the sum of total payments by loan status.

The screenshot shows a Power BI report titled "loan project". The ribbon is visible with tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. The main area features a pie chart titled "SUM OF TOTAL_PYMNT BY LOAN_STATUS". The chart has three segments: a large blue segment labeled "₹ 2.81bn (52.22%)", a smaller orange segment labeled "₹ 0.28bn (5.25%)", and a very small purple segment labeled "₹ 0.01bn (0.23%)". To the right of the chart is a legend titled "loan_status" with the following items: Fully Paid (blue), Current (dark blue), Charged Off (orange), Late (31-120 days) (purple), In Grace Period (pink), Does not meet the credit ... (yellow), Late (16-30 days) (red), Default (dark red), and Does not meet the credit ... (green). The right side of the screen displays the Power BI visualizations pane, which includes sections for Filters, Visualizations, and Data. The Data section shows a list of fields such as "remaining_ins...", "total_amount_...", "total_pymnt", "verification_st...", "funded_amnt", "grade", "id", "installment", "int_rate", "issue_date", "loan_amnt", "loan_status", "purpose", and "term". The "loan_status" field is checked under the "Values" section.

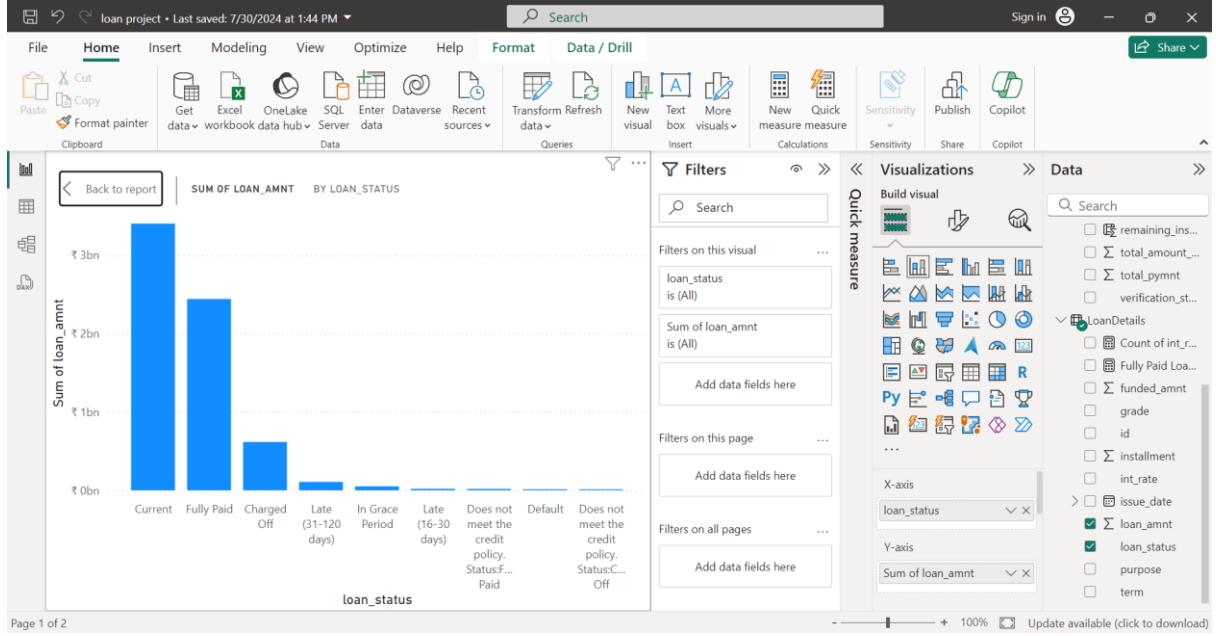
➤ **Loan Amount by Purpose:** Create a treemap to show the average loan amount by purpose.



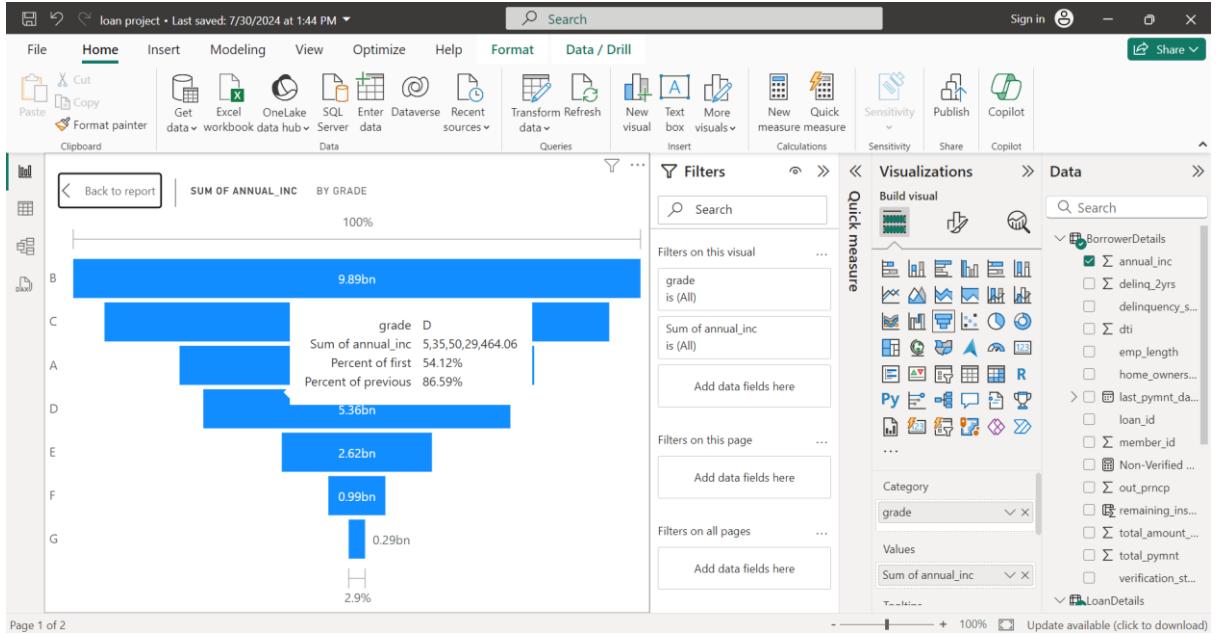
➤ **Installment Over Time:** Create a line chart to visualize the sum of installments by Year and Quarter of the issue date.



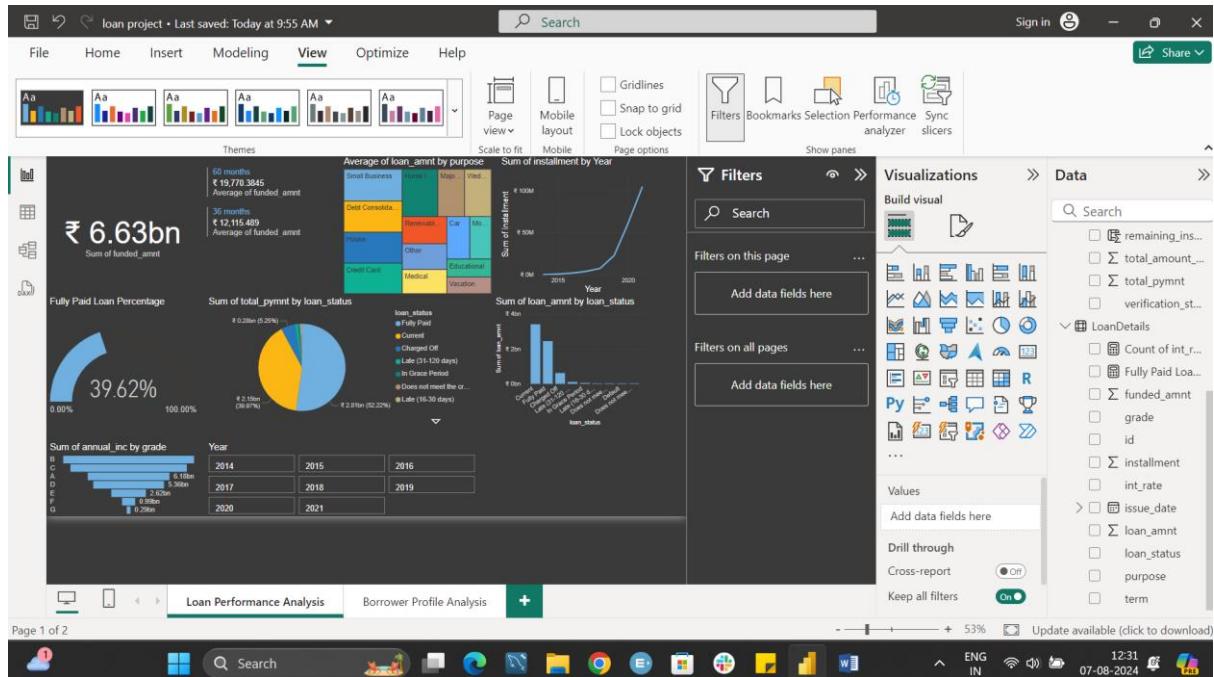
➤ **Maximum Total Amount Paid by Loan Status:** Create a column chart to display the maximum total amount paid by loan status.



➤ **Minimum Annual Income by Grade:** Create a funnel chart to show the minimum annual income by grade.



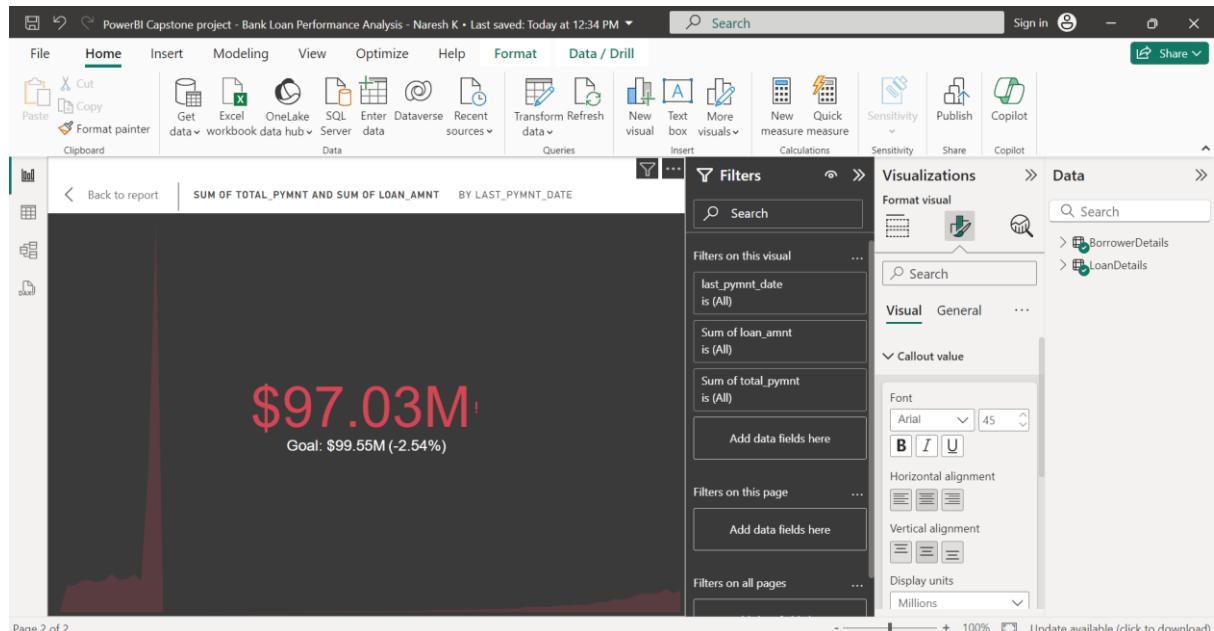
- **Issue Date Slicer:** Add a slicer for the Month of the issue date to enable dynamic data exploration.



Report 2: Borrower Profile Analysis

The Borrower Profile Analysis report aims to provide insights into the characteristics of borrowers such as home ownership, annual income, employment length, verification status, debt-to-income ratio, and delinquency history.

- **KPI Visual:** Create a KPI visual with the sum of total payment as the value, the year of last payment date as the trend axis, and the sum of loan amount as the target. Round off to 2 decimal points and format as \$ currency.



➤ **Average of Annual Income:** Display the average of annual income using a card visual.

The screenshot shows the Power BI desktop interface with a project titled "loan project" last saved at 9:55 AM. The ribbon is visible with tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. On the left, there's a clipboard with a chart showing "₹ 97.03M" and a goal of "₹ 99.55M (-2.54%)". Below it, a card visual displays "Average of annual_inc" with the value "73.29K". The Data pane on the right shows a list of fields under "BorrowerDetails", including "annual_inc" (checked), "delinq_2yrs", "delinquency_s...", "dti", "emp_length", "home_owners...", "last_pymnt_da...", "loan_id", "member_id", "Non-Verified ...", "out_prncp", "remaining_insi...", "total_amount_...", "total_pymnt", and "verification_st...". The "LoanDetails" section is also partially visible. The bottom status bar indicates "Page 2 of 2" and "53%".

➤ **Non-Verified Borrowers Count:** Display the count of non-verified borrowers using a card visual.

The screenshot shows a Power BI desktop interface with a dashboard containing two cards:

- A multi-row card displaying the average annual income: ₹ 73.29K.
- A large rectangular visual showing the count of non-verified borrowers: 148K.

The ribbon at the top includes tabs like Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Data pane on the right lists fields such as Non-Verified Borrower ID, dti, emp_length, home_owners, last_pymnt_d... (selected), out_prncp, remaining_ins..., total_amount..., total_pymnt, and verification_st... (selected). A drill-through option is also present.

➤ **Average Debt-to-Income by Delinquency Status:** Create a multi-row card to show the average debt-to-income ratio by delinquency status.

The screenshot shows a Power BI desktop interface with a table visualization. The ribbon at the top includes tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, Data / Drill, Table tools, and Column tools. The Column tools tab is selected, showing options for Name, Data type, Summarization, Data category, Sort by column, Data groups, Manage relationships, and New column.

The table visualization displays two rows of data under the 'Delinquent' status:

	Average of dti
Not Delinquent	17.23
Delinquent	17.16

The Data pane on the right lists fields including Average of dti, delinquency_status (selected), dti, emp_length, home_owners, last_pymnt_d... (selected), out_prncp, remaining_ins..., total_amount..., total_pymnt, and verification_st... (selected).

➤ **Sum of Loan Amount by Home Ownership:** Create a table to show the total loan amount by home ownership.

The screenshot shows the Power BI desktop interface. On the left, there is a table visual titled "home_ownership Sum of loan_amnt". The table data is as follows:

home_ownership	Sum of loan_amnt
Any	₹ 43,13,975
Mortgage	₹ 5,000
None	₹ 3,76,94,24,100
Other	₹ 6,48,775
Own	₹ 19,67,450
Rent	₹ 56,25,28,610
Total	₹ 6,67,44,56,090

On the right side, the "Data" pane is open, showing the data model with a tree view of tables and columns. The "LoanDetails" table is expanded, showing fields like id, grade, term, purpose, etc.

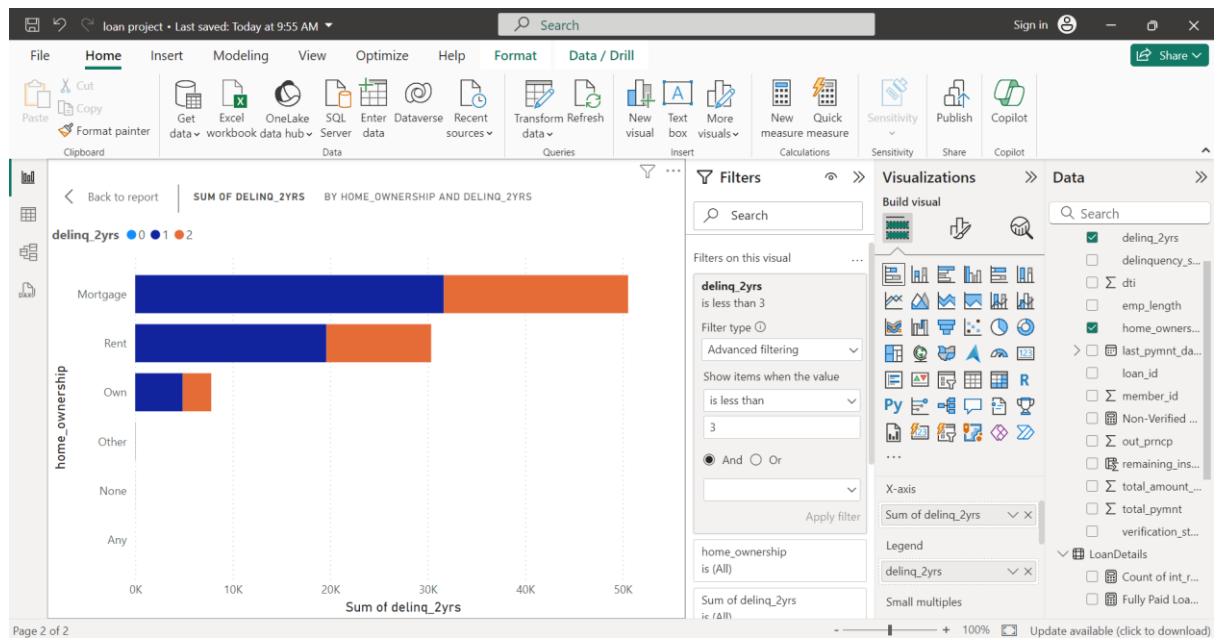
➤ **Average Remaining Principal by Verification Status:** Create a donut chart to display the average remaining outstanding principal by verification status.

The screenshot shows the Power BI desktop interface. On the left, there is a donut chart visual titled "SUM OF REMAINING_INSTALLMENTS BY VERIFICATION_STATUS". The chart segments are:

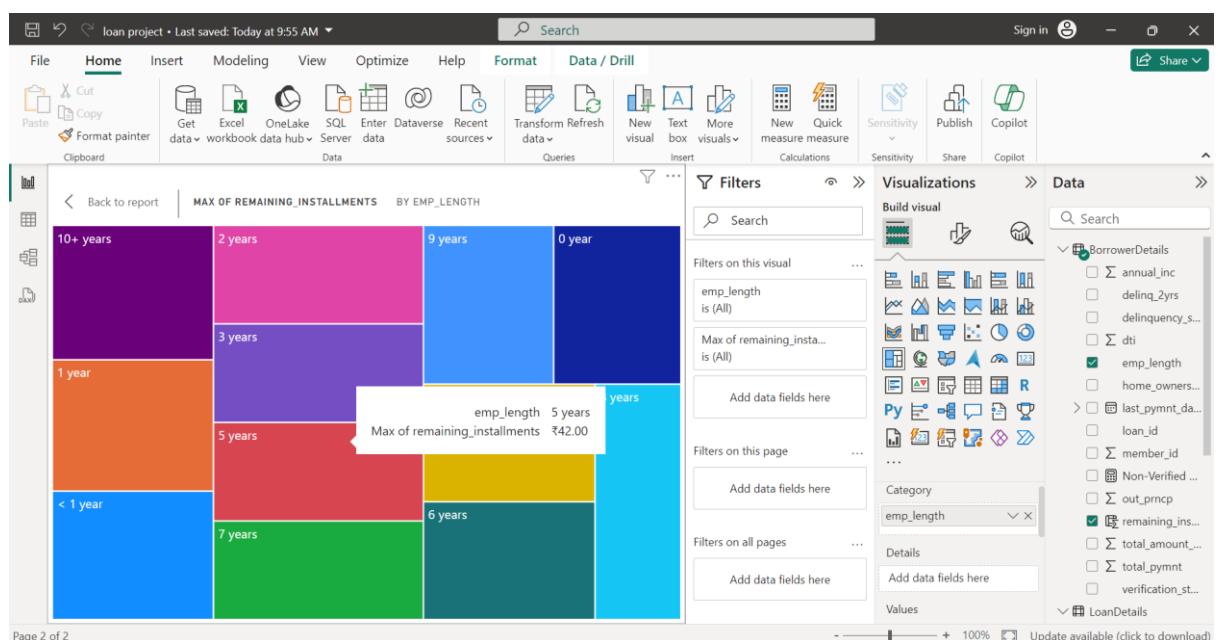
- Blue segment: ₹1.89M (41.22%)
- Orange segment: ₹1.10M (24.1%)
- Dark Blue segment: ₹1.59M (34.68%)

On the right side, the "Data" pane is open, showing the data model with a tree view of tables and columns. The "LoanDetails" table is expanded, showing fields like id, grade, term, purpose, etc. The "remaining_inst..." field is selected in the values list.

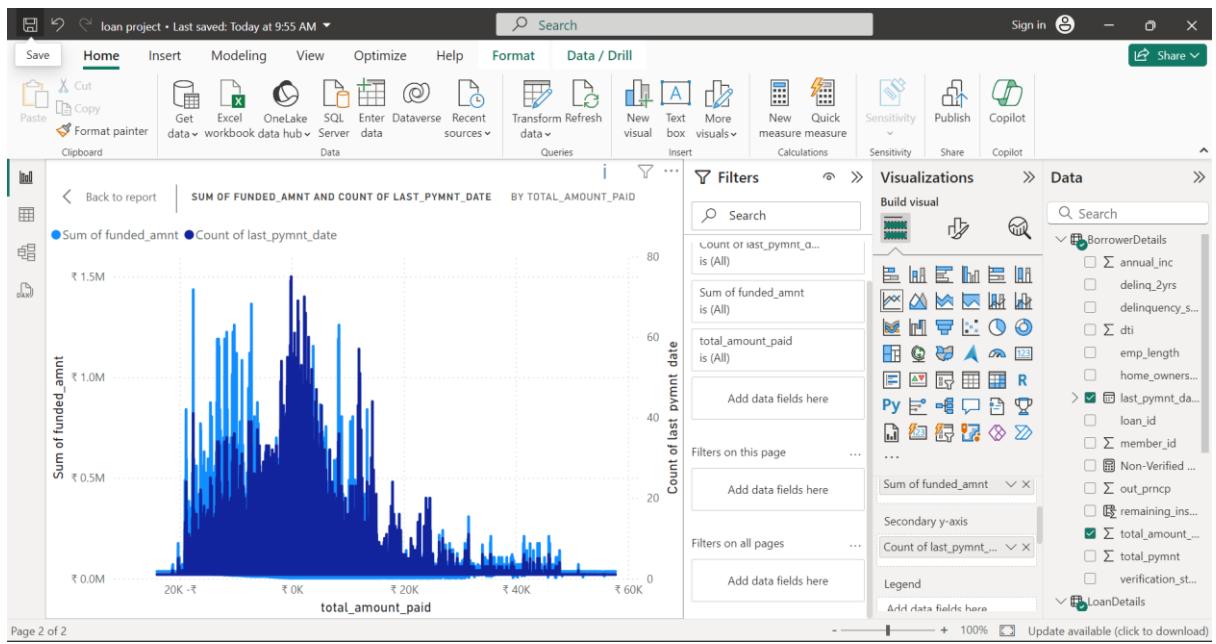
➤ **Sum of Delinquencies by Home Ownership:** Create a bar chart to show the total number of delinquencies in the past 2 years by home ownership and filter the visual to display only Mortgage, Rent, and Own.



➤ **Max Remaining Installments by Employment Length:** Create a treemap to show the maximum remaining installments by employment length.



➤ **Total Amount Paid and Funded Amount Over Time:** Create a line chart to display the sum of total amount paid and the sum of funded amount by the year of last payment date.



➤ **Purpose Slicer:** Add a slicer for loan purpose to enable dynamic data exploration.

