

# CAPSTONE PROJECT

## IN POWER BI

Bank Loan Performance Analysis 2024

Presented by  
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# **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.

## **Problem solving**

- Data cleaning
- Data transformation
- Data modeling
- Data analysis expression
- Data visualizing
- Report interactivity

# **Project Steps and Objectives**

- Importing Data
- Transformation Using Power Query
- Data Modeling
- Creating Measures and Calculated Columns using DAX
- Creating Comprehensive Reports

★ Report 1: Loan Performance Analysis

★ Report 2: Borrower Profile Analysis

# Importing Data

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

The screenshot shows the Power BI Desktop interface. On the left is the Navigator pane, which lists the "bank loan.xlsx" file with its two sheets, "BorrowerDetails" and "LoanDetails", both selected. To the right is a preview of the "LoanDetails" table, showing columns: id, loan\_amnt, funded\_amnt, term, int\_rate, and installment. The table contains 999 rows of loan data. At the bottom of the preview are buttons for Load, Transform Data, and Cancel.

The screenshot shows the Power Query Editor. It displays the "LoanDetails" table with 21 rows of data. The columns are labeled id, loan\_amnt, funded\_amnt, term, and int\_rate. The "term" column has a dropdown menu showing it is set to "36 months". On the right side of the editor, there is a "Query Settings" pane open, showing the "Properties" section with the name "LoanDetails" and the "Applied Steps" section which includes a step named "Changed Type". The status bar at the bottom indicates "11 COLUMNS, 999+ ROWS" and "Column profiling based on top 1000 rows".

# Transformation Using Power Query

## Data Cleaning

Replace missing values (null) in the 'emp\_length' column of the "BorrowerDetails" table with '0 year'

The screenshot shows the Microsoft Power Query Editor interface. The top ribbon has tabs for File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The ribbon also includes sections for Data Sources, Parameters, Query, Manage Columns, Sort, and Transform. On the left, there's a sidebar with 'Queries [2]' and two items: 'BorrowerDetails' and 'LoanDetails'. The main area displays a table with columns: member\_id, loan\_id, emp\_length, home\_ownership, and annual\_inc. A formula bar at the top shows the formula: = Table.ReplaceValue(#"Changed Type", null, "0", Replacer.ReplaceValue, {"emp\_length"}). The table data starts with:

	member_id	loan_id	emp_length	home_ownership	annual_inc
1	1296599	1077501	10+ years	RENT	24
2	1314167	1077430	< 1 year	RENT	30
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	15
11	1305201	1070078	5 years	OWN	72
12	1305008	1069908	10+ years	OWN	75
13	1298717	1064687	< 1 year	RENT	30
14	1304956	1069866	3 years	RENT	15
15	1303503	1069057	3 years	RENT	100
16	1304871	1069759	< 1 year	RENT	28
17	1299699	1065775	4 years	RENT	42
18	1304884	1069971	10+ years	MORTGAGE	110
19	1294539	1062474	1 year	MORTGAGE	84
20	1304855	1069742	6 years	RENT	77385
21	.....	.....	.....	.....	.....

The 'Applied Steps' pane on the right shows the step: Replaced Value.

## Remove rows with missing values in the 'last\_pymnt\_d' and 'delinq\_2yrs' columns.

Screenshot of the Power Query Editor showing the initial dataset and the applied steps for removing blank rows.

**Initial Dataset:**

	dti	delinq_2yrs	last_pymnt_d	total_pymnt	out_prncp
1	27.65	0	01-01-2015	5861.07144	
2	1	0	01-04-2020	1008.71	
3	8.72	0	01-06-2021	3003.653644	
4	20	0	01-01-2015	12226.30221	
5	17.94	0	01-01-2016	3242.17	760
6	11.2	0	01-01-2015	5631.377753	
7	23.51	0	01-01-2016	8136.84	1889
8	5.35	0	01-01-2015	3938.144334	
9	5.55	0	01-04-2019	646.02	
10	18.08	0	01-11-2019	1476.19	
11	16.12	0	01-06-2020	7677.52	
12	10.78	0	01-09-2020	13943.08	
13	10.08	0	01-07-2019	2270.7	
14	12.56	0	01-01-2015	3478.981915	
15	7.06	0	01-10-2020	7471.99	
16	20.31	0	01-01-2015	1270.171106	
17	18.6	0	01-01-2015	12519.26045	
18	10.52	0	01-05-2020	3785.02	
19	18.44	2	01-02-2015	7164.499852	
20	9.86	0	01-07-2019	9459.96	
21	...	...	...	...	...

**Applied Steps:**

- Source
- Navigation
- Promoted Headers
- Changed Type
- Replaced Value
- Removed Blank Rows
- Removed Blank Rows1
- Capitalized Each Word
- Changed Type1
- Renamed Columns
- Added Conditional Column
- Capitalized Each Word1
- Removed Columns
- Added Conditional Column1

Screenshot of the Power Query Editor showing the dataset after removing blank rows and the applied steps.

**Modified Dataset:**

	dti	delinq_2yrs	last_pymnt_d	total_pymnt	out_prncp
1	27.65	0	01-01-2015	5861.07144	
2	1	0	01-04-2020	1008.71	
3	8.72	0	01-06-2021	3003.653644	
4	20	0	01-01-2015	12226.30221	
5	17.94	0	01-01-2016	3242.17	760
6	11.2	0	01-01-2015	5631.377753	
7	23.51	0	01-01-2016	8136.84	1889
8	5.35	0	01-01-2015	3938.144334	
9	5.55	0	01-04-2019	646.02	
10	18.08	0	01-11-2019	1476.19	
11	16.12	0	01-06-2020	7677.52	
12	10.78	0	01-09-2020	13943.08	
13	10.08	0	01-07-2019	2270.7	
14	12.56	0	01-01-2015	3478.981915	
15	7.06	0	01-10-2020	7471.99	
16	20.31	0	01-01-2015	1270.171106	
17	18.6	0	01-01-2015	12519.26045	
18	10.52	0	01-05-2020	3785.02	
19	18.44	2	01-02-2015	7164.499852	
20	9.86	0	01-07-2019	9459.96	
21	...	...	...	...	...

**Applied Steps:**

- Source
- Navigation
- Promoted Headers
- Changed Type
- Replaced Value
- Removed Blank Rows
- Removed Blank Rows1

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

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

- File** tab selected.
- Transform** ribbon tab selected.
- Queries [2]** pane shows two queries: **BorrowerDetails** and **LoanDetails**.
- Table** view displays the **LoanDetails** query with the following schema:

	id	loan_amnt	funded_amnt	term	int_rate
1	1077501	5000	4975	36 months	10
2	1077430	2500	2500	60 months	15
3	1077175	2400	2400	36 months	15
4	1076863	10000	10000	36 months	13
5	1075358	3000	3000	60 months	12
6	1075269	5000	5000	36 months	15
7	1069639	7000	7000	60 months	15
8	1072053	3000	3000	36 months	18
9	1071795	5600	5600	60 months	21
10	1071570	5375	5350	60 months	12
11	1070078	6500	6500	60 months	14
12	1069908	12000	12000	36 months	12
13	1064687	9000	9000	36 months	13
14	1069866	3000	3000	36 months	5
15	1069057	10000	10000	36 months	10
16	1069759	1000	1000	36 months	16
17	1065775	10000	10000	36 months	15
18	1069971	3600	3600	36 months	6
19	1062474	6000	6000	36 months	11
20	1069742	9200	9200	36 months	6
21					
- Transform** ribbon tab selected.
- APPLIED STEPS** pane shows the following steps:
  - Source
  - Navigation
  - Promoted Headers
  - Changed Type
  - Removed Duplicates (highlighted)
- Bottom status bar: 11 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED ON SUNDAY

# Dealing with Inconsistencies

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

The screenshot shows the Power Query Editor interface. The main area displays a table with the following columns and data:

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

The formula bar at the top of the editor shows the formula: = Table.ReplaceValue(#"Removed Duplicates", "\_", " ", ReplaceText, {"purpose"}).

The Query Settings pane on the right side of the editor shows the following details:

- PROPERTIES**: Name is set to LoanDetails.
- APPLIED STEPS**: The steps listed are Source, Navigation, Promoted Headers, Changed Type, Removed Duplicates, and Replaced Value (which is currently selected).

Format the 'purpose' and 'home\_ownership' columns to proper case.

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

- File** tab selected.
- Transform** ribbon tab selected.
- Queries [2]** pane shows two queries: **BorrowerDetails** and **LoanDetails**.
- Table** view displays the **LoanDetails** query results.
- Applied Steps** pane on the right shows the steps taken:
  - Capitalized Each Word
  - Replaced Value
  - Removed Duplicates
  - Changed Type
  - Promoted Headers
  - Navigation
  - Source
- Properties** pane shows the query name is **LoanDetails**.

grade	A <sub>C</sub> sub_grade	issue_d	A <sub>C</sub> loan_status	A <sub>C</sub> purpose
1	B2	01-12-2018	Fully Paid	Credit Card
2	C4	01-12-2018	Charged Off	Car
3	C5	01-12-2018	Fully Paid	Small Business
4	C1	01-12-2018	Fully Paid	Other
5	B5	01-12-2018	Current	Other
6	A4	01-12-2018	Fully Paid	Wedding
7	C5	01-12-2018	Current	Debt Consolidation
8	E1	01-12-2018	Fully Paid	Car
9	F2	01-12-2018	Charged Off	Small Business
10	B5	01-12-2018	Charged Off	Other
11	C3	01-12-2018	Fully Paid	Debt Consolidation
12	B5	01-12-2018	Fully Paid	Debt Consolidation
13	C1	01-12-2018	Charged Off	Debt Consolidation
14	B1	01-12-2018	Fully Paid	Credit Card
15	B2	01-12-2018	Charged Off	Other
16	D1	01-12-2018	Fully Paid	Debt Consolidation
17	C4	01-12-2018	Fully Paid	Home Improvement
18	A1	01-12-2018	Fully Paid	Major Purchase
19	B3	01-12-2018	Fully Paid	Medical
20	A1	01-12-2018	Fully Paid	Debt Consolidation
21				

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

- File** tab selected.
- Transform** ribbon tab selected.
- Queries [2]** pane shows two queries: **BorrowerDetails** and **LoanDetails**.
- Table** view displays the **BorrowerDetails** query results.
- Applied Steps** pane on the right shows the steps taken:
  - Capitalized Each Word
  - Removed Blank Rows1
  - Replaced Value
  - Removed Duplicates
  - Changed Type
  - Promoted Headers
  - Navigation
  - Source
- Properties** pane shows the query name is **BorrowerDetails**.

i <sub>2</sub> member_id	i <sub>2</sub> loan_id	A <sub>C</sub> emp_length	A <sub>C</sub> home_ownership	1.2 annual_inc
1	1296599	1077501	Rent	24
2	1314167	1077430	Rent	30
3	1313524	1077175	Rent	12
4	1277178	1076863	Rent	49
5	1311748	1075358	Rent	80
6	1311441	1075269	Rent	36
7	1304742	1069639	Rent	47
8	1288686	1072053	Rent	48
9	1306957	1071795	Own	40
10	1306721	1071570	Rent	15
11	1305201	1070078	Own	72
12	1305008	1069908	Own	75
13	1298717	1064687	Rent	30
14	1304956	1069866	Rent	15
15	1303503	1069057	Rent	100
16	1304871	1069759	Rent	28
17	1299699	1065775	Rent	42
18	1304884	1069971	Mortgage	110
19	1294539	1062474	Mortgage	84
20	1304855	1069742	Rent	7738
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 'BorrowerDetails' query selected. In the 'Applied Steps' pane, the 'Changed Type1' step is highlighted, indicating it was used to change the data type of the 'total\_pymnt' column. The data grid displays a list of rows with columns including 'delinq\_2yrs', 'last\_pymnt\_d', '\$ total\_pymnt', and 'out\_prncp'. The 'total\_pymnt' column contains values like 27.65, 1, 8.72, etc., which are now displayed as fixed decimal numbers.

Round off the numbers in the 'funded\_amnt' column to 2 decimal places.

The screenshot shows the Power Query Editor interface with the 'LoanDetails' query selected. In the 'Applied Steps' pane, the 'Changed Type1' step is highlighted, indicating it was used to change the data type of the 'funded\_amnt' column. The data grid displays a list of rows with columns including 'id', 'loan\_amnt', '\$ funded\_amnt', 'term', and 'int\_rate'. The 'funded\_amnt' column contains values like 5000, 2500, 2400, etc., which are now rounded to two decimal places.

# Column Renaming

Rename the column 'issue\_d' to 'issue\_date'.

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

- File Bar:** Home, Transform, Add Column, View, Tools, Help.
- Toolbars:** Close & Apply, New Source, Recent Sources, Data, Data source settings, Manage Parameters, Refresh Preview, Advanced Editor, Properties, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Split Column, Group By, Data Type: Date, Use First Row as Headers, Merge Queries, Append Queries, Text Analytics, Vision, Combine Files, Azure Machine Learning, Combine, AI Insights.
- Queries List:** BorrowerDetails, LoanDetails.
- Table View:** A table with columns: grade, sub\_grade, issue\_d, loan\_status, purpose. The 'issue\_d' column is highlighted with a red border.
- Applied Steps Panel:** Shows the history of steps taken, with 'Renamed Columns' highlighted.
- Query Settings Panel:** Shows the query name 'LoanDetails'.

Rename the column 'last\_pymnt\_d' to 'last\_pymnt\_date'

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

- File Bar:** Home, Transform, Add Column, View, Tools, Help.
- Toolbars:** Close & Apply, New Source, Recent Sources, Data, Data source settings, Manage Parameters, Refresh Preview, Advanced Editor, Properties, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Split Column, Group By, Data Type: Date, Use First Row as Headers, Merge Queries, Append Queries, Text Analytics, Vision, Combine Files, Azure Machine Learning, Combine, AI Insights.
- Queries List:** BorrowerDetails, LoanDetails.
- Table View:** A table with columns: dti, delinq\_2yrs, last\_pymnt\_d, total\_pymnt, out\_prncp. The 'last\_pymnt\_d' column is highlighted with a red border.
- Applied Steps Panel:** Shows the history of steps taken, with 'Renamed Columns' highlighted.
- Query Settings Panel:** Shows the query name 'BorrowerDetails'.

# 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'.

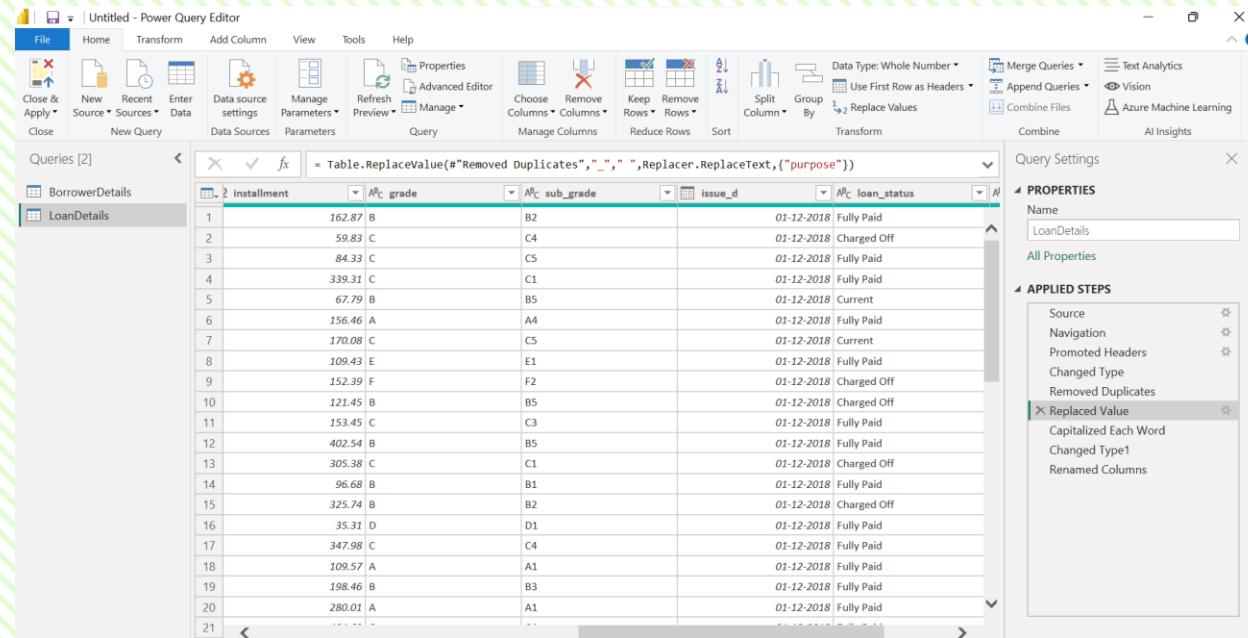
The screenshot shows the Power BI Desktop interface with the 'Home' tab selected. A query editor window is open, displaying a table with various columns. A calculated column 'total\_amount\_paid' is being defined with the formula `= [total_pymnt] - [out_prncp]`. The right pane shows the data model with relationships and a list of columns.

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"

The screenshot shows the Power Query Editor with two queries: 'BorrowerDetails' and 'LoanDetails'. In the 'BorrowerDetails' query, a new column 'delinquency\_status' is being added using the formula `= Table.AddColumn(#"Removed Columns", "delinquency_status", each if [delinq_2yrs] > 0 then`. The right pane displays the 'APPLIED STEPS' and 'Query Settings' panes.

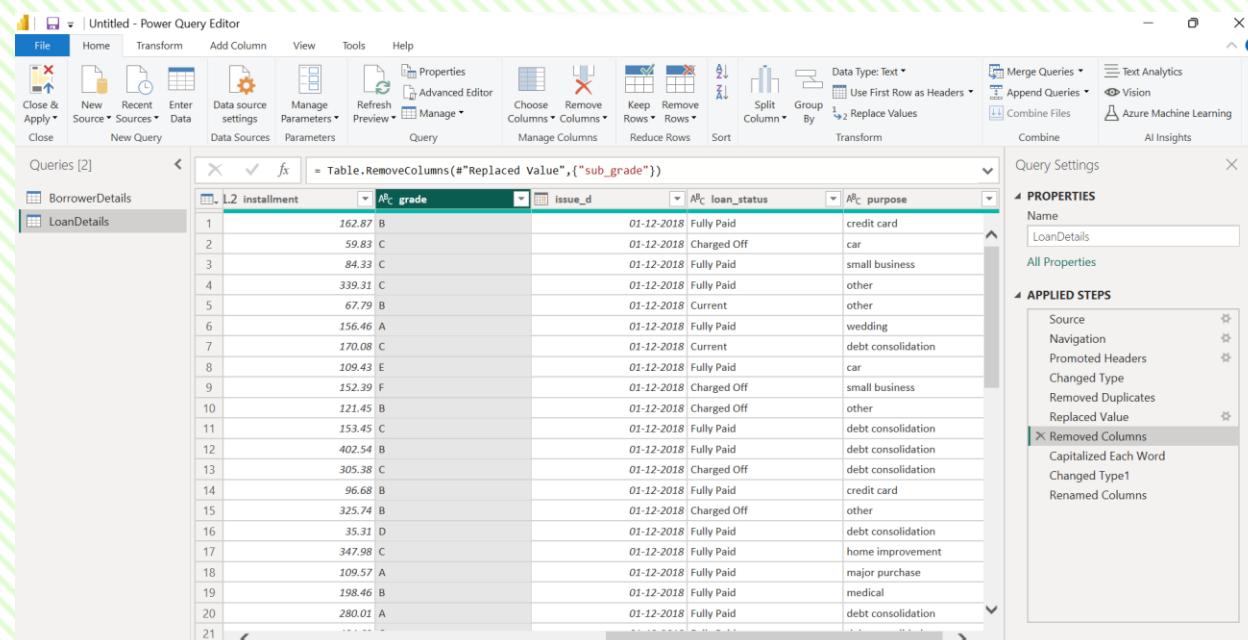
# Column Dropping

Remove the 'sub\_grade' column as that does not significantly contribute to the analysis



The screenshot shows the Power Query Editor interface with the 'LoanDetails' query selected. In the main grid, the 'sub\_grade' column is highlighted with a red border. The 'Transform' tab is active, and the 'Remove' button is highlighted in the ribbon. The 'APPLIED STEPS' pane on the right shows the step 'Replaced Value'.

Installment	Avg grade	Avg sub_grade	issue_d	Avg loan_status
162.87	B	B2	01-12-2018	Fully Paid
59.83	C	C4	01-12-2018	Charged Off
84.33	C	C5	01-12-2018	Fully Paid
339.31	C	C1	01-12-2018	Fully Paid
67.79	B	B5	01-12-2018	Current
156.46	A	A4	01-12-2018	Fully Paid
170.08	C	C5	01-12-2018	Current
109.43	E	E1	01-12-2018	Fully Paid
152.39	F	F2	01-12-2018	Charged Off
121.45	B	B5	01-12-2018	Charged Off
153.45	C	C3	01-12-2018	Fully Paid
402.54	B	B5	01-12-2018	Fully Paid
305.38	C	C1	01-12-2018	Charged Off
96.68	B	B1	01-12-2018	Fully Paid
325.74	B	B2	01-12-2018	Charged Off
35.31	D	D1	01-12-2018	Fully Paid
347.98	C	C4	01-12-2018	Fully Paid
109.57	A	A1	01-12-2018	Fully Paid
198.46	B	B3	01-12-2018	Fully Paid
280.01	A	A1	01-12-2018	Fully Paid

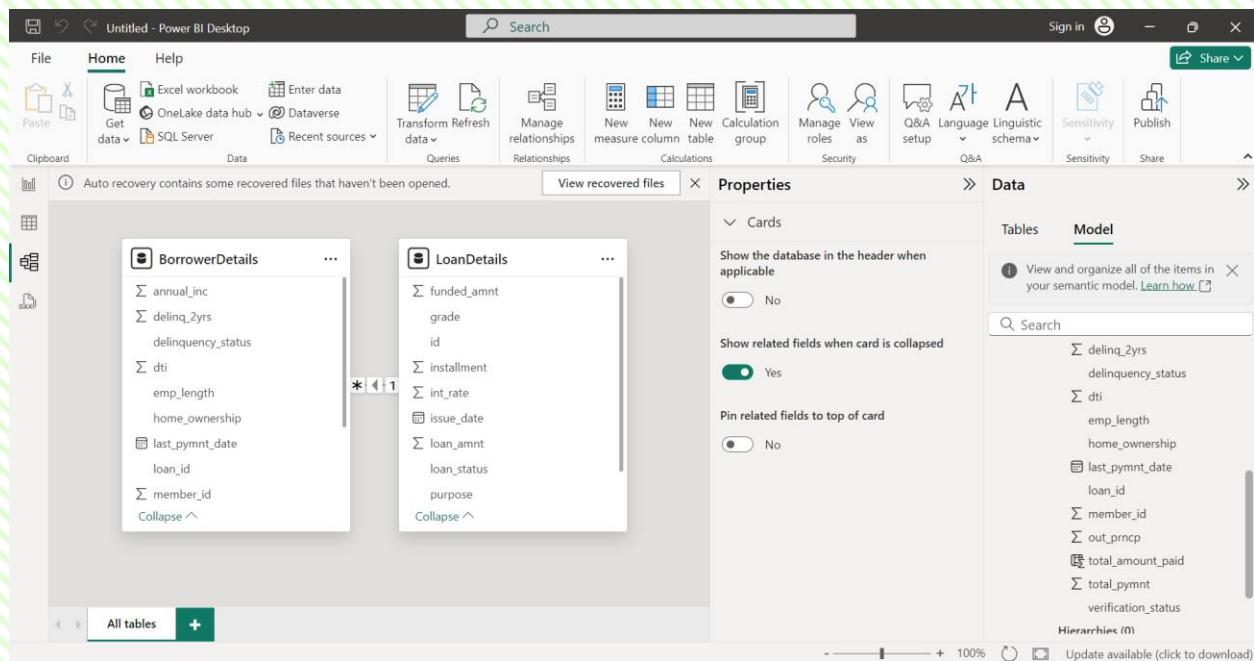


The screenshot shows the Power Query Editor interface with the 'LoanDetails' query selected. The 'sub\_grade' column is no longer present in the grid. The 'Transform' tab is active, and the 'Remove' button is highlighted in the ribbon. The 'APPLIED STEPS' pane on the right shows the step 'Removed Columns'.

Installment	Avg grade	issue_d	Avg loan_status	Avg purpose
162.87	B	01-12-2018	Fully Paid	credit card
59.83	C	01-12-2018	Charged Off	car
84.33	C	01-12-2018	Fully Paid	small business
339.31	C	01-12-2018	Fully Paid	other
67.79	B	01-12-2018	Current	other
156.46	A	01-12-2018	Fully Paid	wedding
170.08	C	01-12-2018	Current	debt consolidation
109.43	E	01-12-2018	Fully Paid	car
152.39	F	01-12-2018	Charged Off	small business
121.45	B	01-12-2018	Charged Off	other
153.45	C	01-12-2018	Fully Paid	debt consolidation
402.54	B	01-12-2018	Fully Paid	debt consolidation
305.38	C	01-12-2018	Charged Off	debt consolidation
96.68	B	01-12-2018	Fully Paid	credit card
325.74	B	01-12-2018	Charged Off	other
35.31	D	01-12-2018	Fully Paid	debt consolidation
347.98	C	01-12-2018	Fully Paid	home improvement
109.57	A	01-12-2018	Fully Paid	major purchase
198.46	B	01-12-2018	Fully Paid	medical
280.01	A	01-12-2018	Fully Paid	debt consolidation

# 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.



# 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 'Column tools' tab selected. A new column 'remaining\_installments' is being defined with the formula: `= DIVIDE(BorrowerDetails[out_prncp], RELATED(LoanDetails[installment]))`. The 'Format' dropdown is set to 'Decimal number'. The 'Summarization' dropdown is set to 'Sum'. The 'Data category' is 'Uncategorized'. The 'Sort by column' dropdown is set to 'Remaining installments'. The 'Properties' pane on the right shows various calculated columns and measures, with 'remaining\_installments' highlighted.

cation_status	dti	delinq_2yrs	last_pymnt_date	total_pymnt	out_prncp	total_amount_paid	delinquency_status	remaining_installments
d	6.21	0	01 November 2020	₹ 23,996.94	0	23996.94	Not Delinquent	0.00
d	21.5	0	01 June 2021	₹ 22,756.2027	0	22756.20	Not Delinquent	0.00
d	18.45	0	01 February 2019	₹ 20,596.97	0	20596.97	Not Delinquent	0.00
d	21.45	0	01 June 2020	₹ 16,632.6	0	16632.60	Not Delinquent	0.00
d	14.61	0	01 June 2021	₹ 21,630.52	0	21630.52	Not Delinquent	0.00
d	23.34	0	01 January 2019	₹ 4,587.44	0	4587.44	Not Delinquent	0.00
d	6.15	0	01 March 2019	₹ 8,314.15	0	8314.15	Not Delinquent	0.00
d	11.71	0	01 June 2021	₹ 13,303.6626	0	13303.66	Not Delinquent	0.00
d	19.66	0	01 May 2019	₹ 15,848.53	0	15848.53	Not Delinquent	0.00
d	12.33	0	01 October 2018	₹ 20,191.73	0	20191.73	Not Delinquent	0.00
d	8.73	0	01 January 2020	₹ 7,471.48	0	7471.48	Not Delinquent	0.00
d	21.62	0	01 July 2021	₹ 21,624.7793	0	21624.78	Not Delinquent	0.00
d	12.57	0	01 February 2021	₹ 41,662.89	0	41662.89	Not Delinquent	0.00
d	14.14	0	01 February 2021	₹ 11,630.13	0	11630.13	Not Delinquent	0.00
d	6.84	0	01 January 2020	₹ 6,815.21	0	6815.21	Not Delinquent	0.00
d	8.88	0	01 August 2019	₹ 10,436.19	0	10436.19	Not Delinquent	0.00
d	8.31	0	01 July 2018	₹ 219.11	0	219.11	Not Delinquent	0.00
d	16.63	0	01 June 2021	₹ 7,609.7545	0	7609.75	Not Delinquent	0.00

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. On the left, there's a navigation pane with icons for Home, Insert, Modeling, View, Optimize, Help, Format, Data / Drill, and a clipboard section. The main area displays a report titled 'Untitled - Power BI Desktop'. The report contains a single visual, a card, which shows the value '148K' with the label 'Non verified borrowers count'. To the right of the visual is a 'Quick measure' panel with sections for 'Filters on this visual', 'Filters on this page', and 'Filters on all pages'. Below these is a 'Fields' section containing 'Non verified borrower...' and a 'Drill through' section with options for 'Cross-report' and 'Keep all filters'. The 'Data' pane on the far right lists various data fields, including 'Non verified b...' (which is checked), and a 'LoanDetails' section. The bottom of the screen shows standard window controls like minimize, maximize, and close, along with a status bar indicating 'Page 1 of 1' and zoom levels.

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 a single text visual on the canvas. The text visual displays the value '185K'. In the 'Filters on this visual' pane, there is a single filter named 'fully paid is (All)'. The 'Fields' pane shows a single field named 'fully paid'. The 'Data' pane on the right shows a hierarchical list of fields under 'LoanDetails', with 'fully paid' selected. The page navigation bar at the bottom indicates 'Page 1 of 1'.

The screenshot shows the Power BI Desktop interface with a single text visual on the canvas. The text visual displays the value '466K'. In the 'Filters on this visual' pane, there is a single filter named 'Total number Loans is (All)'. The 'Fields' pane shows a single field named 'Total number Loans'. The 'Data' pane on the right shows a hierarchical list of fields under 'LoanDetails', with 'Total number Loans' selected. The page navigation bar at the bottom indicates 'Page 1 of 1'.

Untitled - Power BI Desktop

File Home Insert Modeling View Optimize Help Format Data / Drill

Paste Cut Copy Get data Excel OneLake SQL Enter Dataverse Recent sources Transform Refresh data New visual Text box More visuals New measure measure Insert Calculations Sensitivity Share Publish Copilot Clipboard Data

Auto recovery contains some recovered files that haven't been opened.

185K  
fully paid

466K  
Total number Loans

40%  
fully paid loan percentage

View recovered files

Search

Filters on this visual

fully paid loan percent... is (All)

Add data fields here

Filters on this page

Add data fields here

Filters on all pages

Add data fields here

Quick measure

Build visual

Visualizations

Data

Search

total\_amount...  
 $\Sigma$  total\_pymnt  
verification\_st...

LoanDetails

- fully paid
- fully paid loan...
- $\Sigma$  funded\_amnt
- grade
- id
- $\Sigma$  installment
- $\Sigma$  int\_rate

issue\_date

- $\Sigma$  loan\_amnt
- loan\_status
- purpose
- term

Total number ...

Drill through

Cross-report

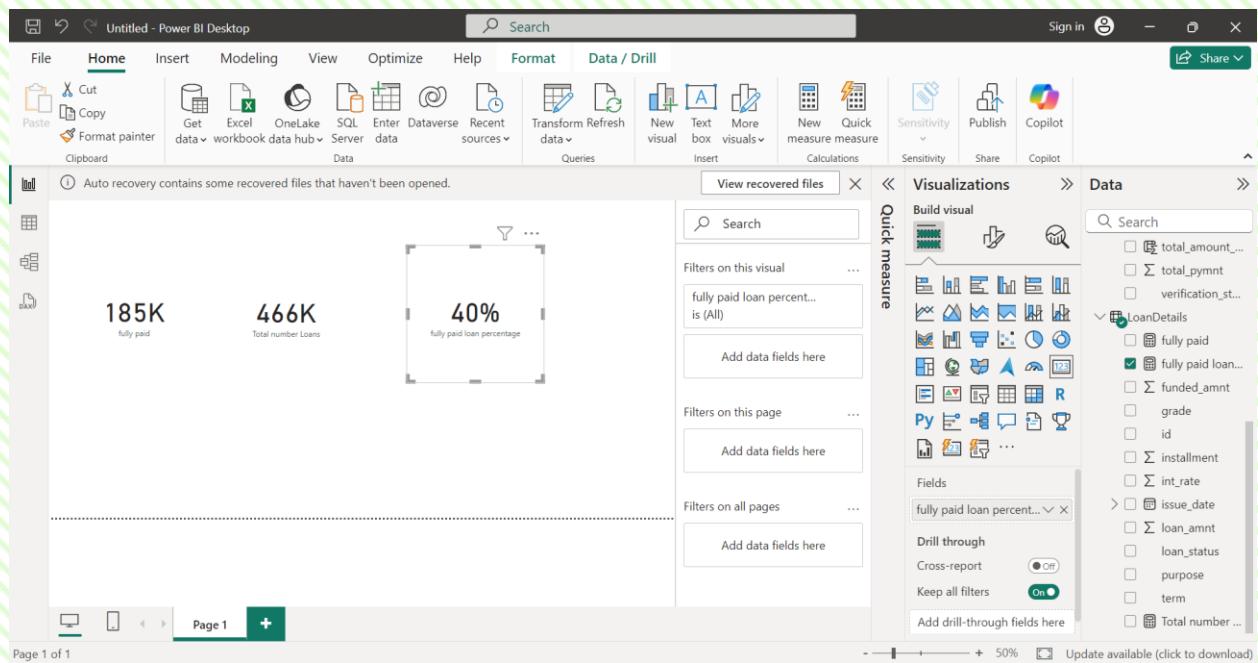
Keep all filters

Add drill-through fields here

Page 1

50%

Update available (click to download)



# Creating Comprehensive Reports

## Report 1: Loan Performance Analysis

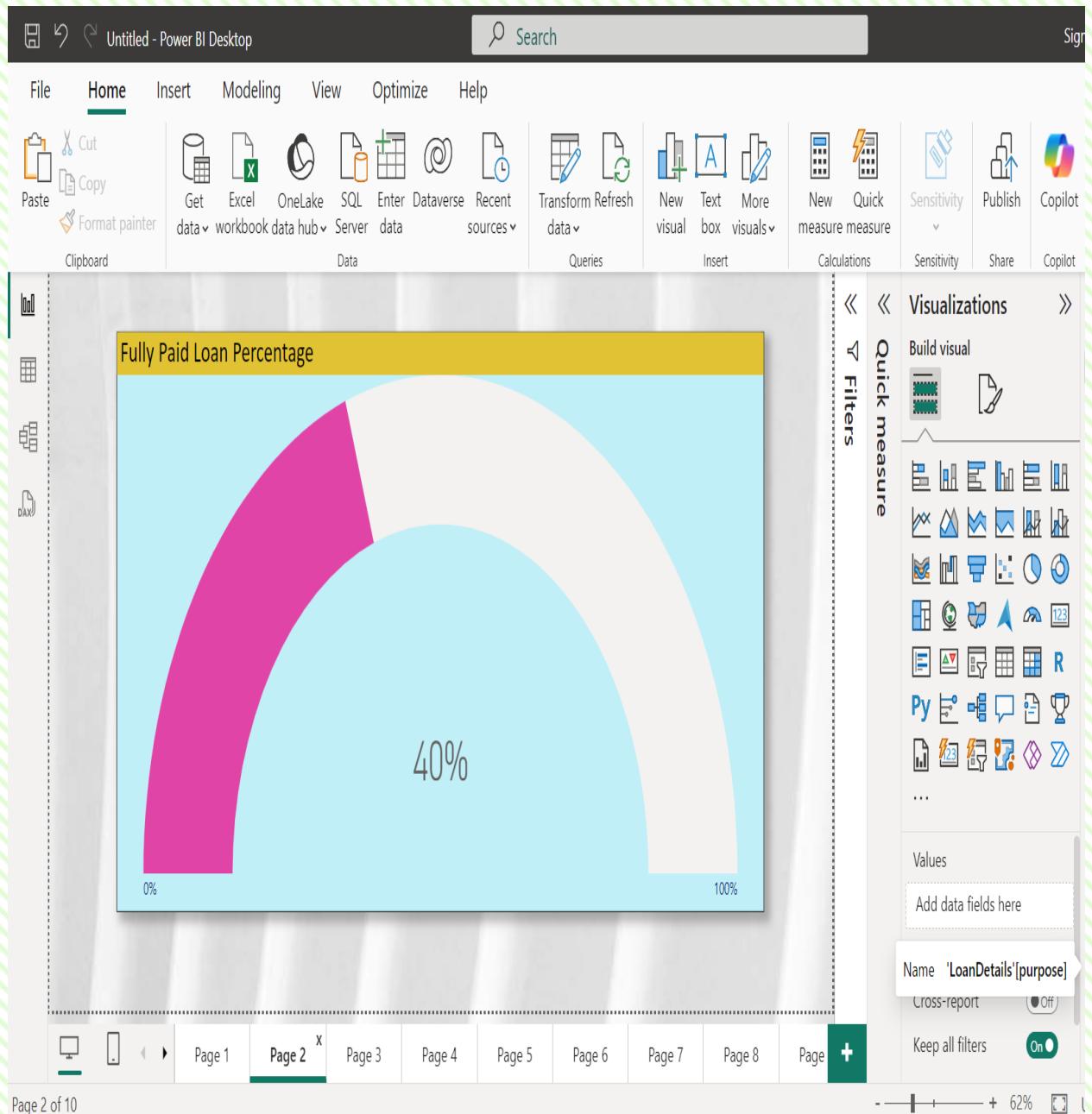
The Loan Performance Analysis report aims to provide insights into the performance of loans based on various factors such as loan amount, loan status, term, interest rate, and purpose.

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:

- Top Bar:** Untitled - Power BI Desktop, Search, Sign In.
- Home Tab:** Selected.
- Clipboard:** Paste, Cut, Copy, Format painter.
- Data Tab:** Get data (Clipboard, Excel, OneLake, SQL, Enter, Dataverse, Recent sources), Transform data (Transform, Refresh, New visual, Text box, More), Queries (New measure, Quick measure).
- Insert Tab:** Insert (New visual, Text box, More), Insert (Visualizations, Quick measure, Filters).
- Calculated Tab:** Calculations, Sensitivity, Publish, Copilot.
- Report View:** Shows a card visual titled "Total Fund Amount" with the value "₹ 6.63bn" and the subtitle "Sum of funded\_amnt".
- Visualizations Panel:** Build visual, Values (Add data fields here), Drill through (Cross-report, Keep all filters On/Off).

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



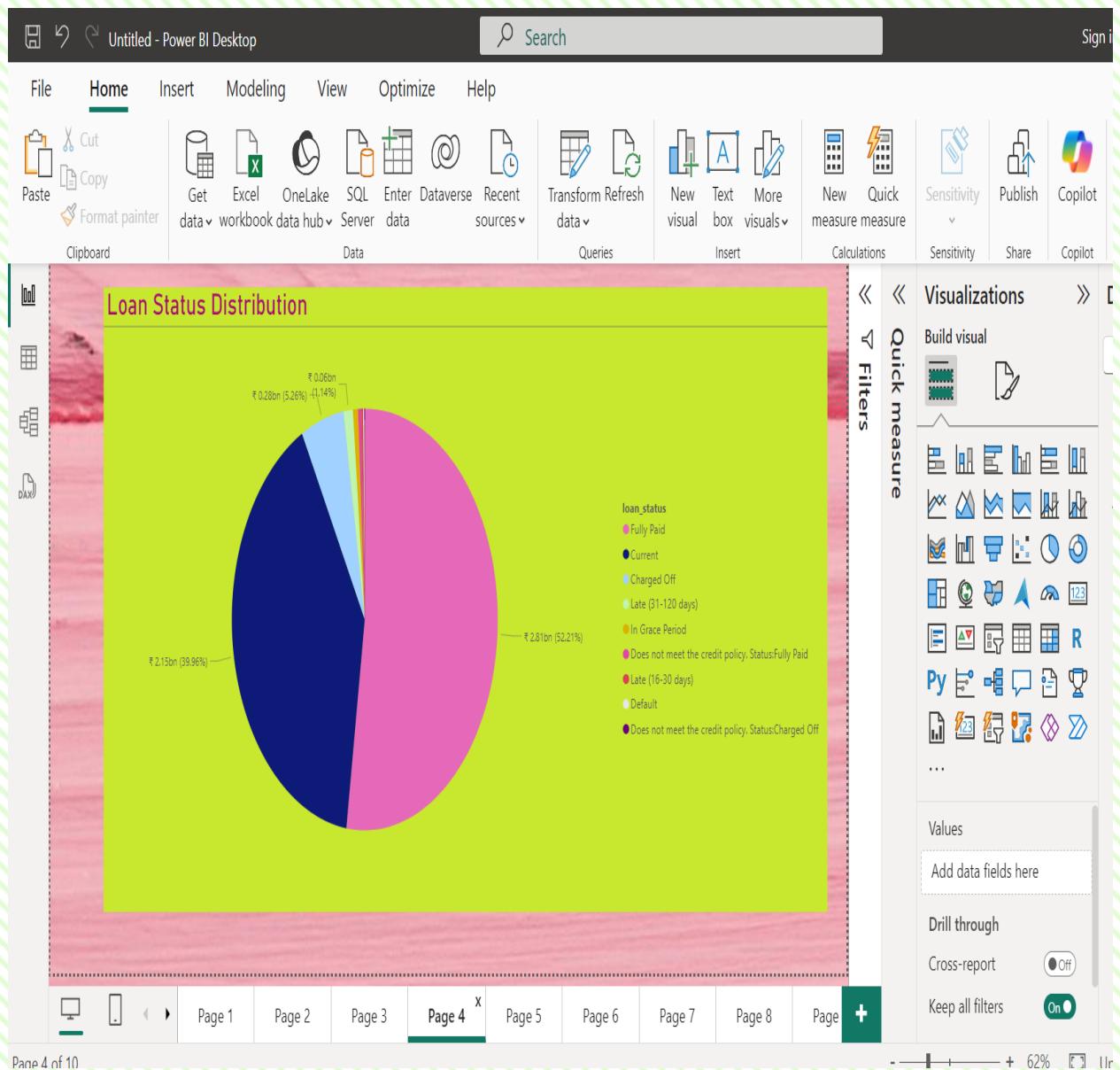
## Average Interest Rate by Term: Create a multi-row card to show the average interest rate for each term

The screenshot shows the Power BI Desktop interface with a multi-row card visual titled "Average Interest Rate by Term". The visual displays two rows of data:

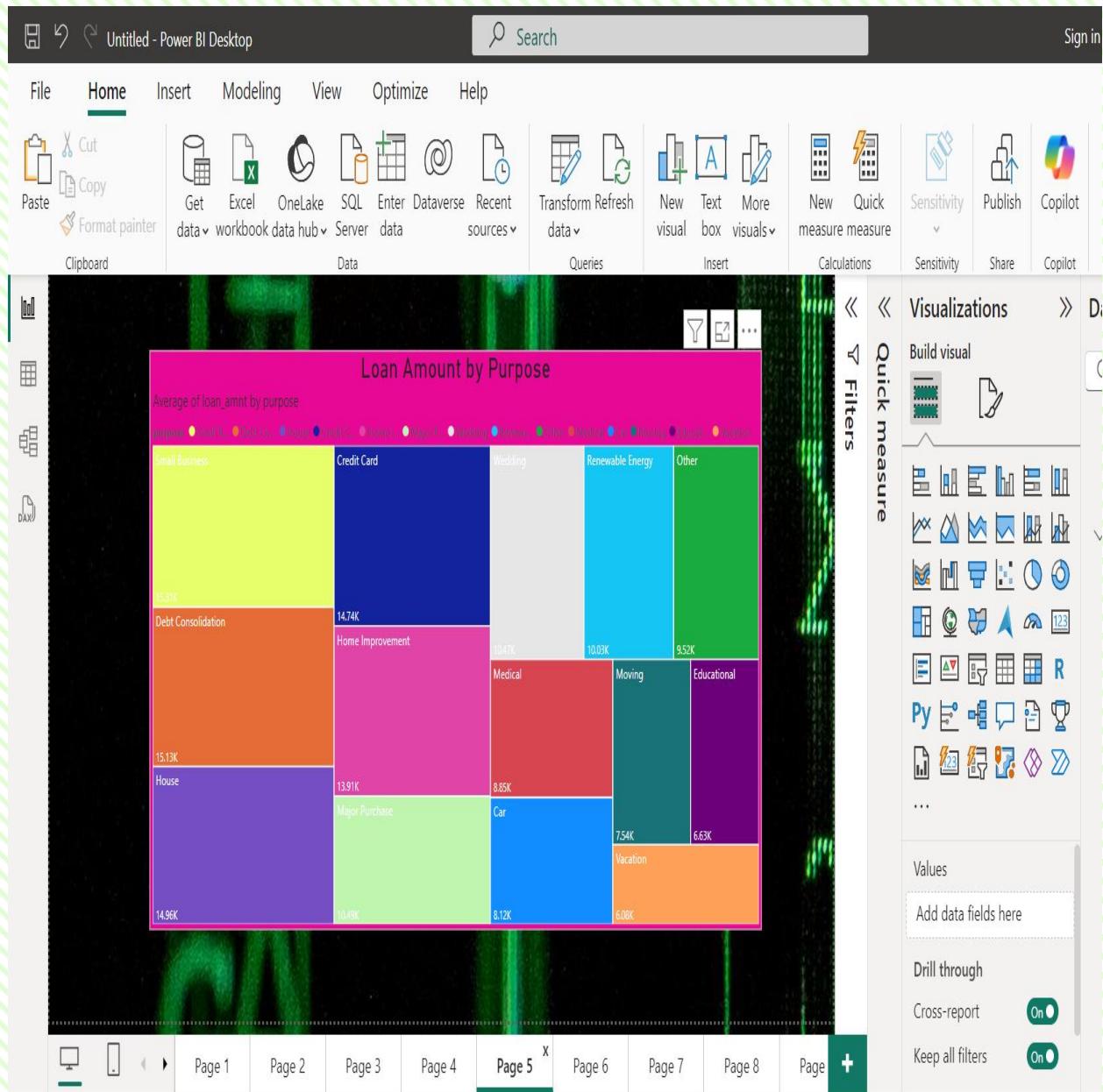
Term	Average int_rate
60 months	16.96
36 months	12.64

The visual has a yellow header row and a green body row. The "Home" tab is selected in the ribbon. The "Visualizations" pane on the right shows the visual's properties, including its title and effects. The "Data" pane lists various data fields such as annual\_inc, delinq\_2yrs, dti, emp\_length, home\_ownership, last\_pymnt\_date, loan\_id, member\_id, Non\_verified\_borr..., out\_prncp, remaining\_install..., round\_off\_install..., total\_amount\_paid, total\_pymnt, verification\_status, and LoanDetails.

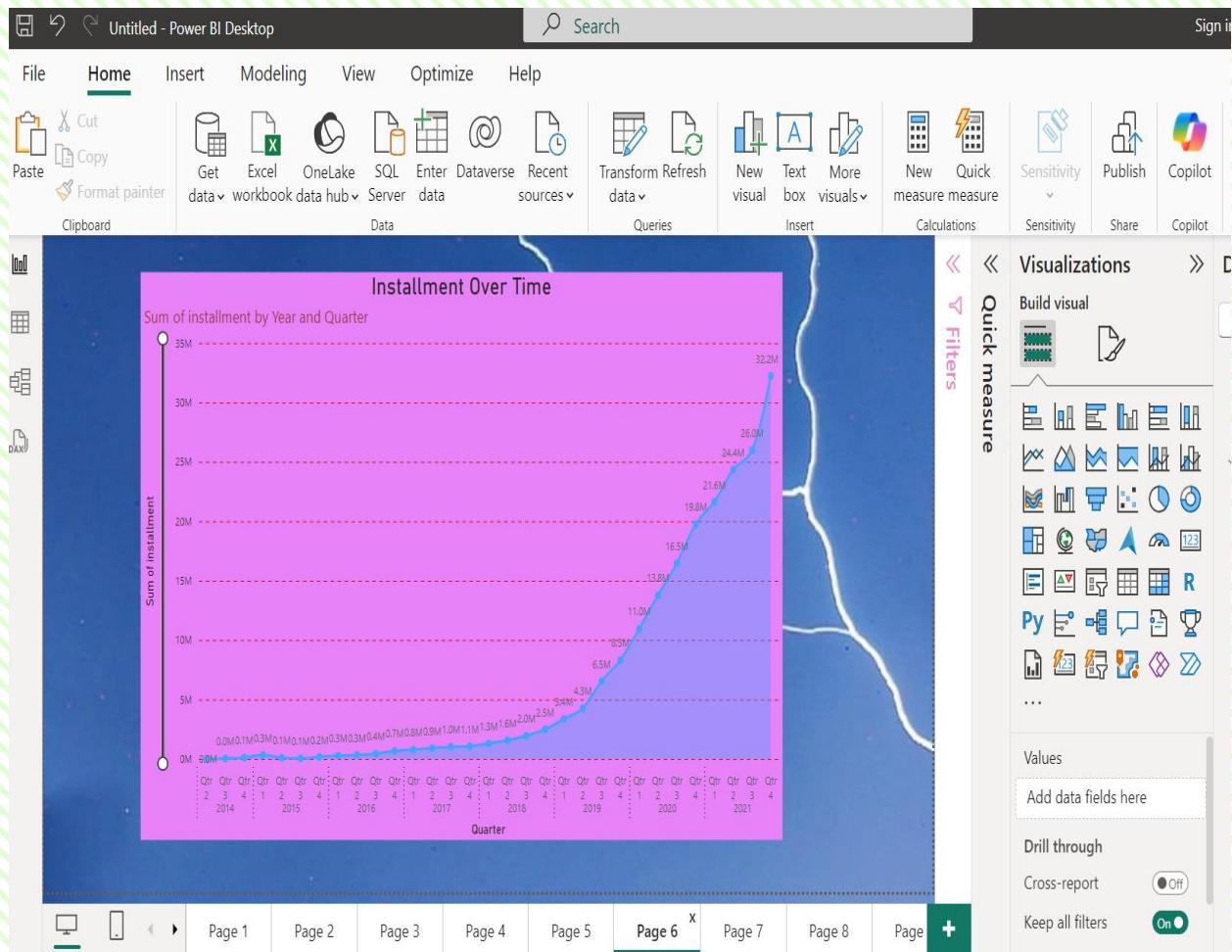
## Loan Status Distribution: Create a pie chart to visualize the sum of total payments by loan status



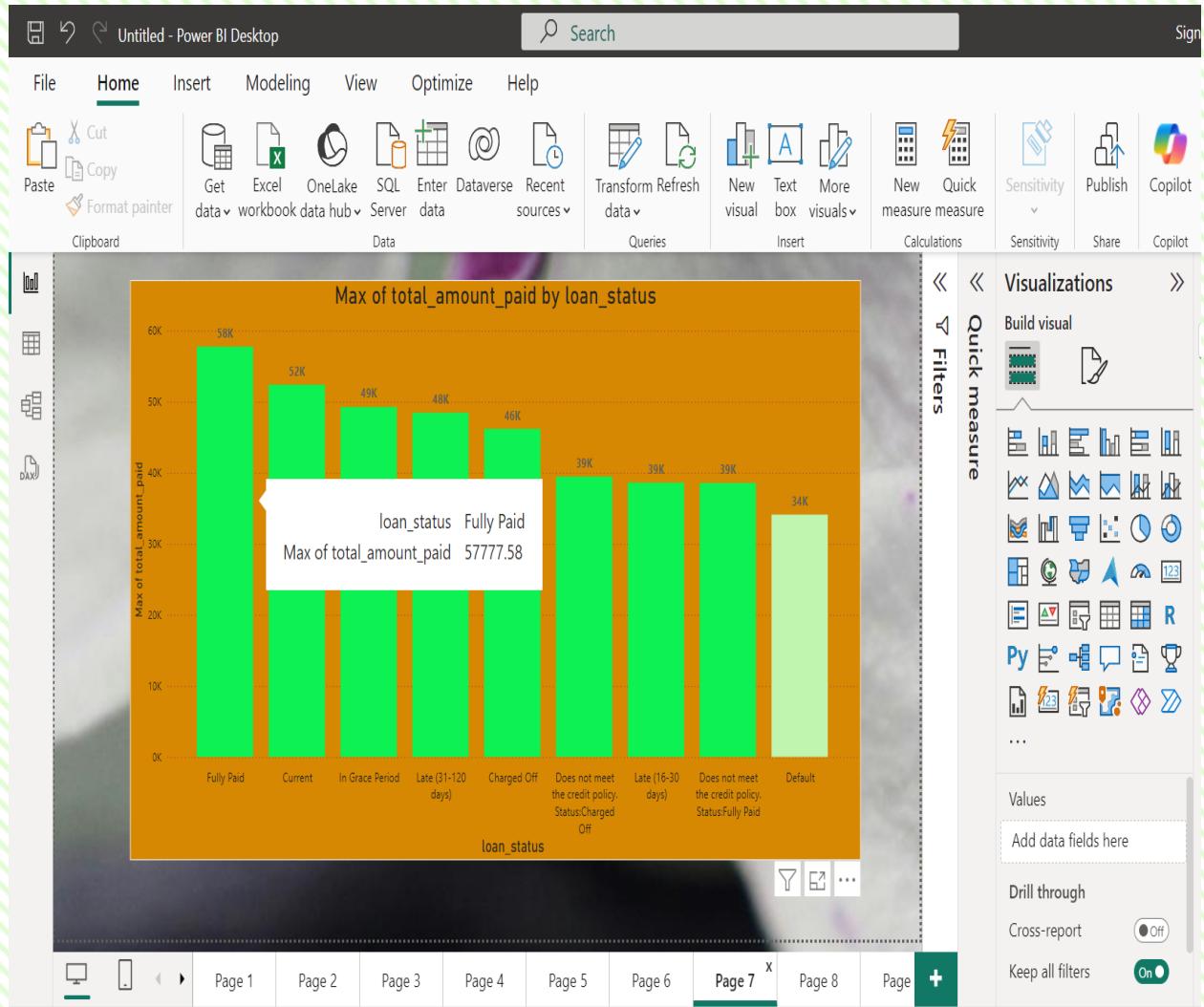
**Loan Amount by Purpose:** Create a treemap to show the average loan amount by purpose.



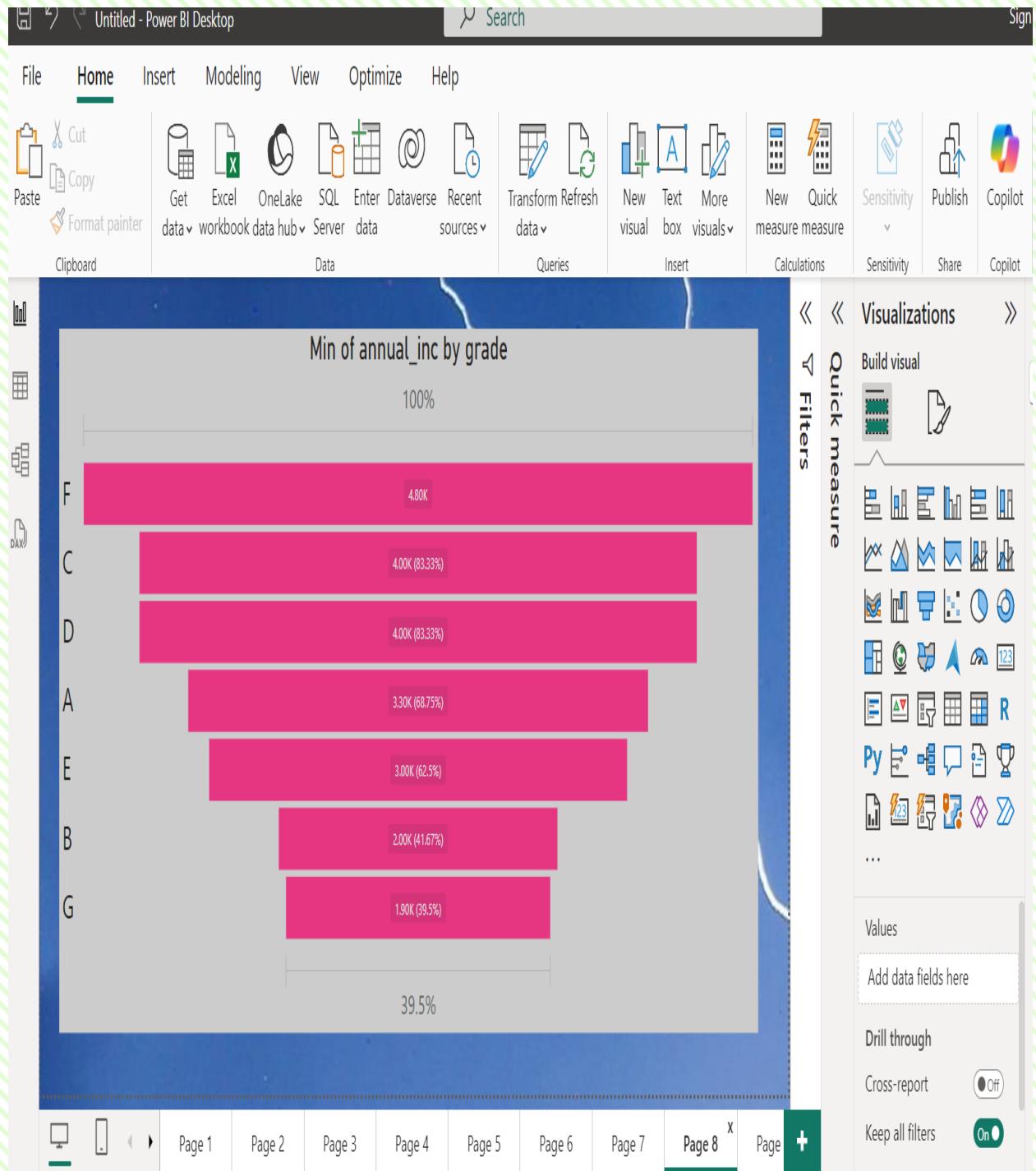
**Installment Over Time: Create a line chart to visualize the sum of installments by Year and Quarter of the issue date.**



**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

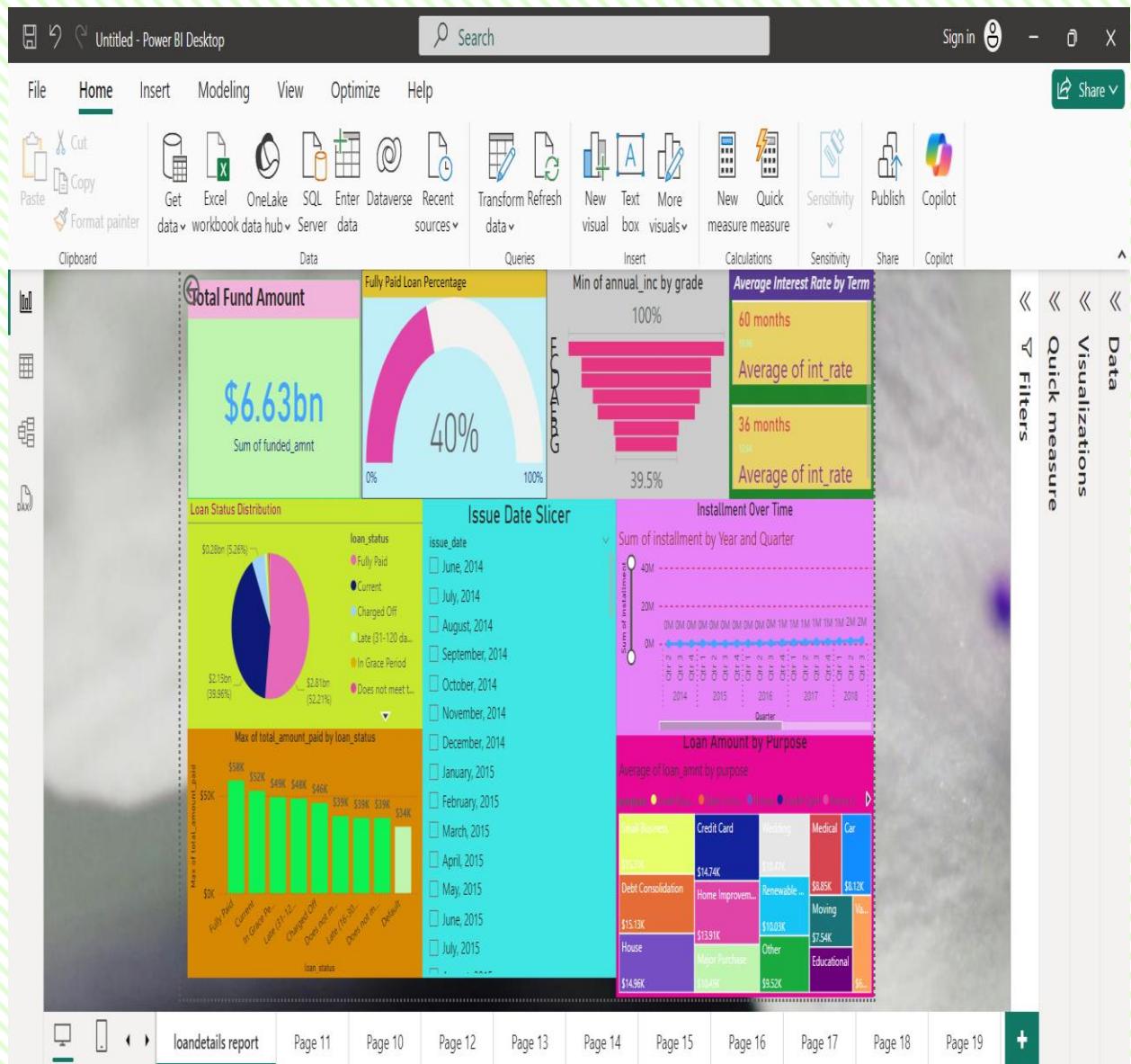


**Issue Date Slicer:** Add a slicer for the Month of the issue date to enable dynamic data exploration

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

- Top Bar:** Untitled - Power BI Desktop, Search, Sign in.
- Home Tab:** Selected.
- Clipboard:** Paste, Cut, Copy, Format painter.
- Data Tab:** Get data (Excel, OneLake, SQL, Server, data hub), Refresh data, Recent sources.
- Queries Tab:** Transform data, Refresh data, New visual, Text box, More visuals.
- Insert Tab:** New measure, Quick measure, Sensitivity, Share, Copilot.
- Calculated Column Tab:** Sensitivity, Share, Copilot.
- Message Bar:** There are pending changes in your queries that haven't been applied. Buttons: Apply changes, Discard changes.
- Visualizations Panel:** Build visual, Filters, Quick measure, Values (Add data fields here), Drill through, Cross-report (On), Keep all filters (On).
- Issue Date Slicer:** A list of months from June 2014 to September 2015.
- Page Navigation:** Page 1 to Page 8, Page +.

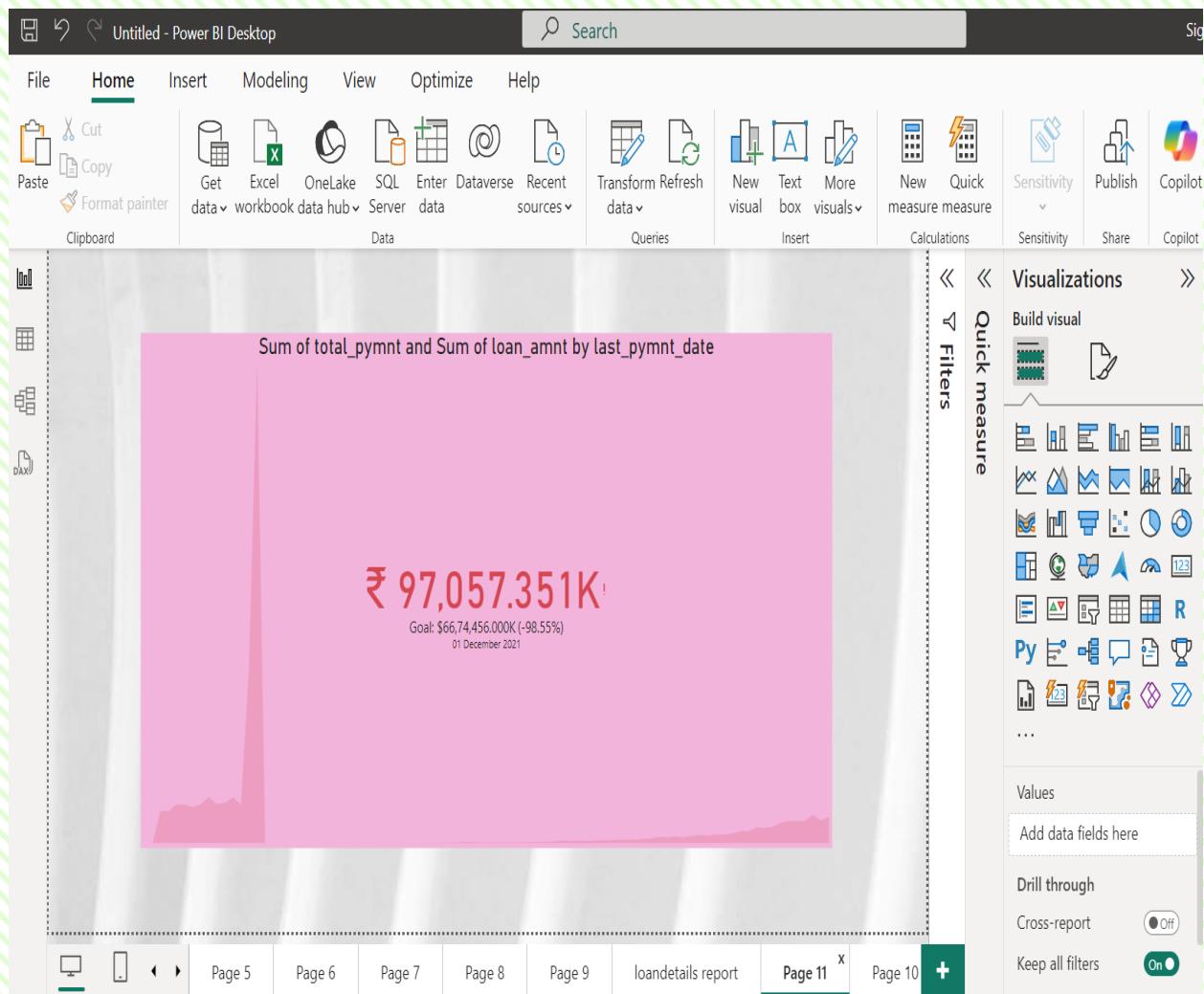
# Report 1: Loan Performance Analysis



## 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. At the top, the ribbon has tabs: File, Home (selected), Insert, Modeling, View, Optimize, and Help. The Home tab contains icons for Paste, Cut, Copy, Format painter, Get data, Excel, OneLake, SQL Server, Enter data, Data hub, Recent sources, Transform data, Refresh data, New visual, Text box, More visuals, New measure, Quick measure, Sensitivity, Publish, and Copilot. Below the ribbon is the canvas area where a card visual is displayed. The card has a title "Average of Annual Income" and a value "73.28K" with the subtitle "Average of annual\_inc". To the left of the canvas is a vertical navigation bar with icons for Report, Page, and DAX. On the right side, there is a "Visualizations" pane with a search bar and sections for Format page, Page information, Canvas settings, Canvas background, and Wallpaper. Under Wallpaper, there are options for Color (white), Image (a placeholder image from pexels.com), and Image fit (Normal). The bottom of the screen shows the page navigation bar with tabs for Report, Page 11, Page 10 (selected), Page 12, Page 13, Page 14, Page 15, and a plus sign for adding new pages.

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

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

- File** tab selected.
- Home** tab active.
- Clipboard** section: Paste, Cut, Copy, Format painter.
- Data** section: Get data (data, workbook, data hub), OneLake, SQL Server, Enter data, Dataverse, Recent sources.
- Queries** section: Transform data, Refresh data, New visual, Text box, More visuals, Insert.
- Insert** section: New measure, Quick measure, Calculations, Sensitivity, Share, Copilot.
- Visualizations** pane: Quick measure, Filters, Format page, Search, Page information, Canvas settings, Canvas background, Wallpaper (Color: white).
- Card Visual:** A dark red rectangular card with the text "148K" and "Non-verified borrowers count".
- Page Navigation:** loandetails report, Page 11, Page 12 (selected), Page 13, Page 14, Page 15.
- Image Fit:** Normal.

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 the Power BI Desktop interface with the following details:

- Top Bar:** Untitled - Power BI Desktop, Search, Sign in, Share.
- Home Tab:** Cut, Copy, Paste, Format painter, Get data (Excel, OneLake, SQL, Data hub, Server), Enter Data, Refresh data, New visual, Text box, More visuals, New measure, Quick measure, Sensitivity, Publish, Copilot.
- Message Bar:** There are pending changes in your queries that haven't been applied. Buttons: Apply changes, Discard changes.
- Visualizations:** A multi-row card visualization titled "Average Debt-to-Income by Delinquency Status (Blank)". It displays four rows of data:
  - Delinquent: Average of dti = 7.75
  - Not Delinquent: Average of dti = 17.16
  - Delinquent: Average of dti = 17.23
  - Not Delinquent: Average of dti = 17.23
- Right Panel:** Quick measure settings for the visualization, including filters, color, image, and image fit options. The image is set to "pixels-inspiredimg...".
- Bottom Navigation:** Page navigation buttons (Page 13, Page 14, Page 15, Page 16, Page 17, Page 18, Page 19) and a borrow... button.

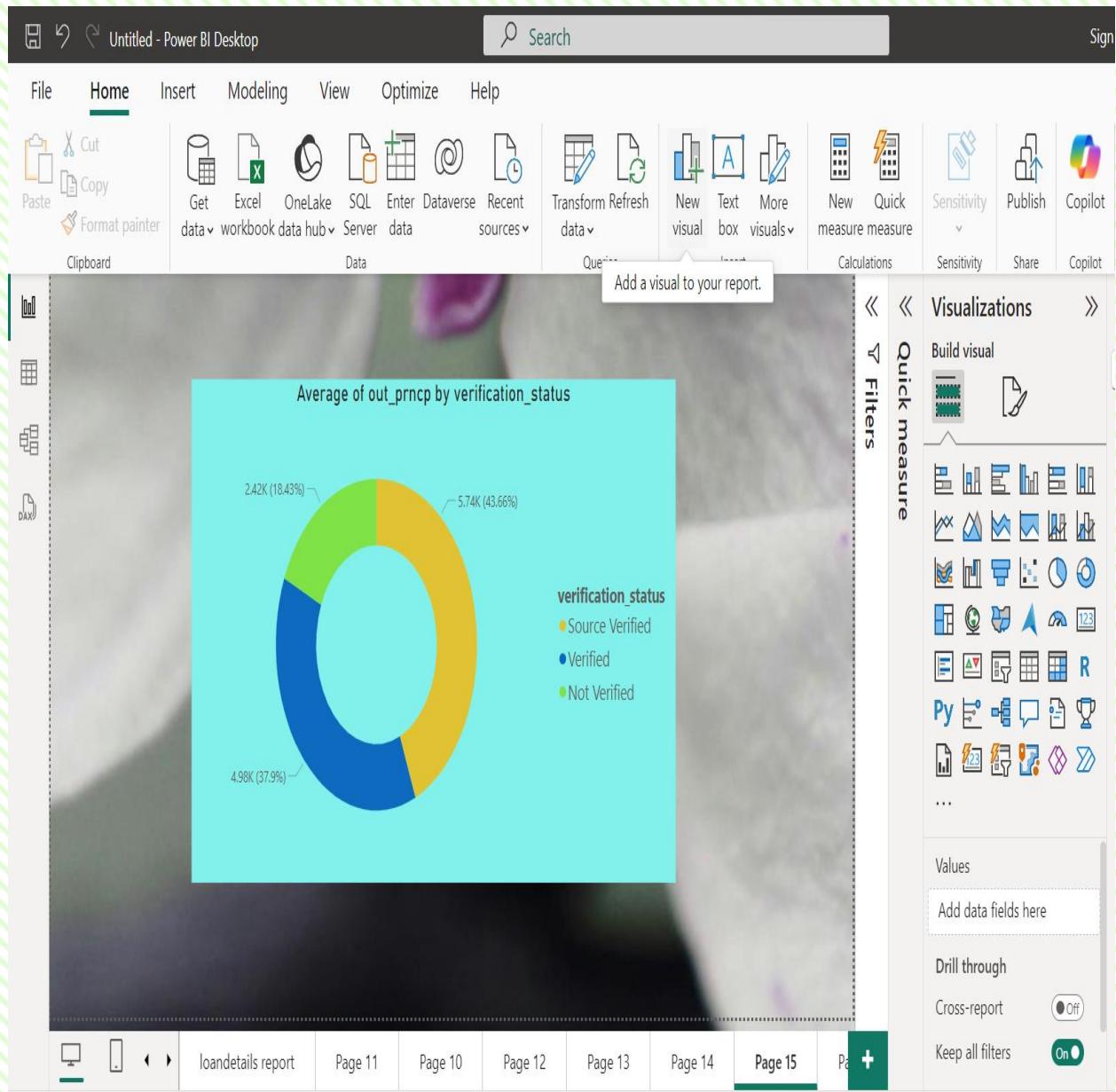
Sum of Loan Amount by Home Ownership: Create a table to show the total loan amount by home ownership.

The screenshot shows the Power BI Desktop interface with a table visualization titled "Sum of Loan Amount by Home Ownership". The table has two columns: "home\_ownership" and "Sum of loan\_amnt". The data is as follows:

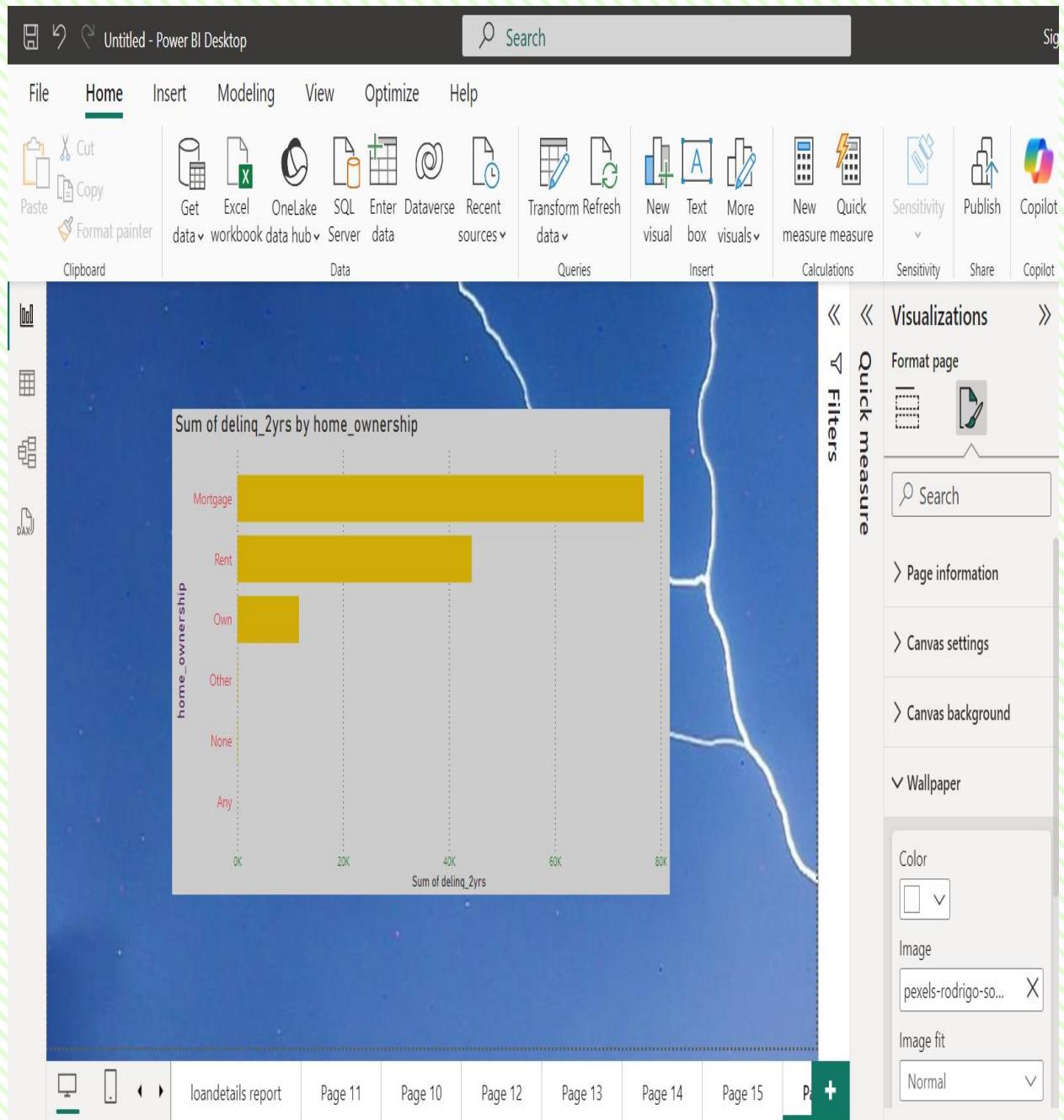
home_ownership	Sum of loan_amnt
Any	\$6,67,44,56,000
Mortgage	\$6,67,44,56,000
None	\$6,67,44,56,000
Other	\$6,67,44,56,000
Own	\$6,67,44,56,000
Total	\$6,67,44,56,000

A yellow banner at the top of the visualization area states: "⚠ There are pending changes in your queries that haven't been applied." It includes "Apply changes" and "Discard changes" buttons. To the right, the "Visualizations" pane is open, showing options like "Format page", "Search", "Page information", "Canvas settings", "Canvas background", and "Wallpaper". The "Wallpaper" section is expanded, showing "Color" (white), "Image" (set to "pixels-solomon-s..."), and "Image fit" (set to "Normal").

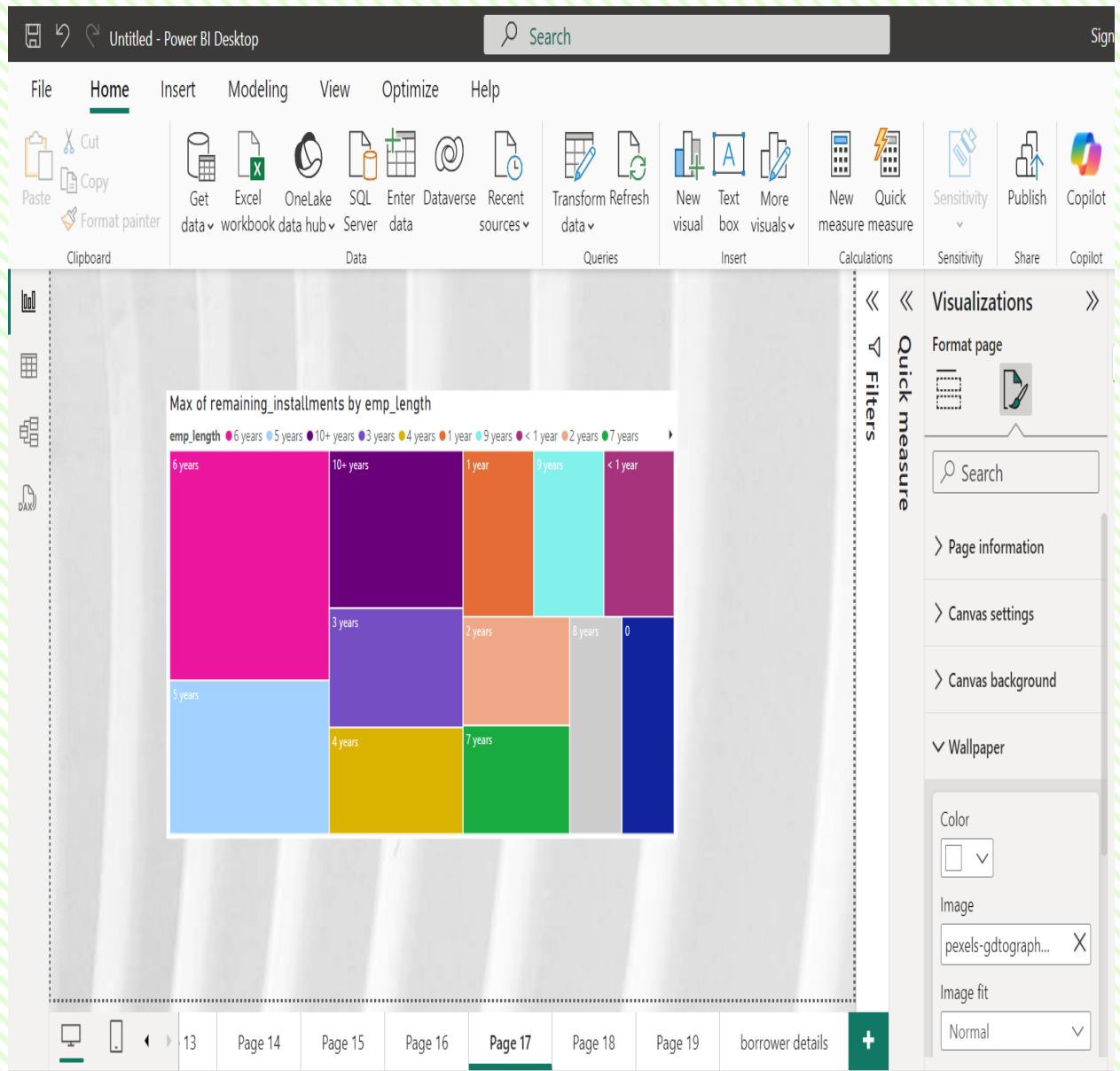
Average Remaining Principal by Verification Status: Create a donut chart to display the average remaining outstanding principal by verification status.



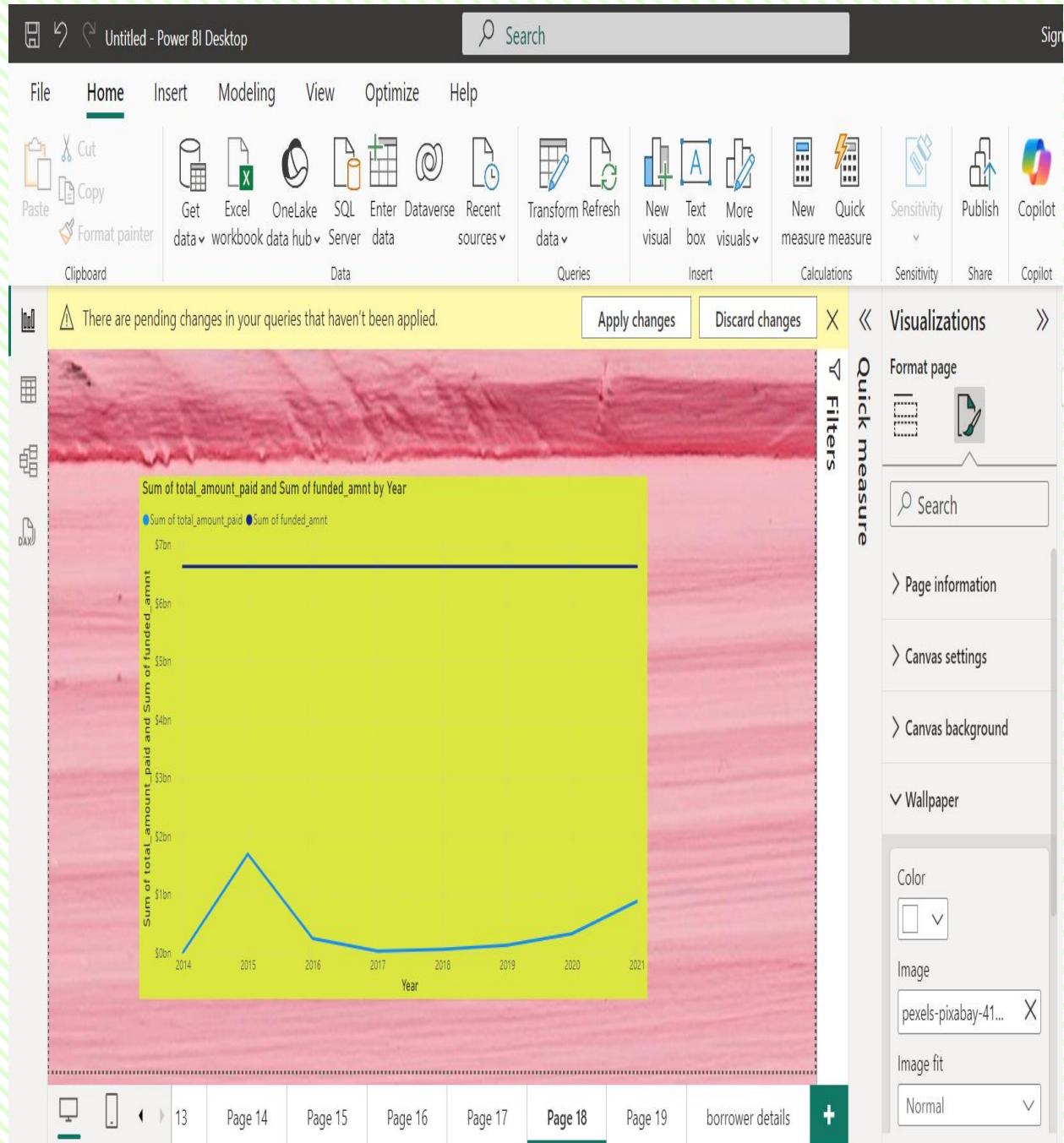
**Sum of Delinquencies by Home Ownership:** Create a bar chart to show the total number of delinquencies in the past 2 years by home ownership and filter the visual to display only Mortgage, Rent, and Own.



**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

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

- Top Bar:** Untitled - Power BI Desktop, Search bar, Sign-in button.
- Ribbon Menu:** File, Home (selected), Insert, Modeling, View, Optimize, Help, Format, Data / Drill.
- Clipboard:** Cut, Copy, Paste, Format painter, Get data, Excel, OneLake, SQL Server, Enter data, Refresh data, Recent sources, Transform data, New visual, Text box, More visuals, New measure, Quick measure, Sensitivity, Publish, Copilot.
- Alert:** There are pending changes in your queries that haven't been applied. Buttons: Apply changes, Discard changes.
- Visuals Area:** A 'Purpose Slicer' visual is displayed. It has a purple header with the title 'Purpose Slicer'. The legend lists various loan purposes: Car, Credit Card, Debt Consolidation, Educational, Home Improvement (selected), House, Major Purchase, Medical, Moving, Other, Renewable Energy, Small Business, Vacation, Wedding.
- Filters Panel:** Shows the selected filter 'purpose'.
- Visualizations Panel:** Shows icons for various visualization types: Build visual, Line chart, Bar chart, Stacked bar chart, Scatter plot, Map, Heatmap, Timeline, Gantt chart, Treemap, Radar chart, Pyramid chart, Chat, Document, Report, and R.
- Bottom Navigation:** Page navigation buttons (13, Page 14, Page 15, Page 16, Page 17, Page 18, Page 19, borrower details), a green plus button, and filter settings: Drill through (Off), Cross-report (Off), Keep all filters (On).

## Report 2: Borrower Profile Analysis

Untitled - Power BI Desktop

Search

Sign in

File Home Insert Modeling View Optimize Help Format Data / Drill Share

Cut Copy Paste Format painter Clipboard Data Get data Excel OneLake SQL Enter data Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert Calculations Sensitivity New measure Quick measure Sensitivity Share Publish Copilot

**Sum of total\_pymnt and Sum of loan\_amnt by last\_pymnt\_date**

\$81,631.695K  
Goal: \$66,74,456.000K (-98.76%)  
01 December 2021

Average Debt-to-Income by Delinquency Status

Delinquency Status	Average of dti
Delinquent	17.3%
Not Delinquent	11.3%

123K Non verified borrowers count

Sum of Loan Amount by Home Ownership

home_ownership	Sum of loan_amnt
Any	\$6,67,44,56,000
Mortgage	\$6,67,44,56,000
None	\$6,67,44,56,000
Other	\$6,67,44,56,000
Own	\$6,67,44,56,000
Dont	\$6,67,44,56,000
Total	\$6,67,44,56,000

Average of Annual Income

\$71.64K

Average of annual\_inc

Max of remaining\_installments by emp\_length

emp_length	Max of remaining_installments
6 years	9 years
5 years	7 years
4 years	8 years
3 years	1 year
< 1 year	0
10+ years	2 years

Average of out\_prncp by verification\_status

purpose

- Car
- Credit Card
- Debt Consolidation
- Educational
- Home Improvement
- House
- Major Purchase
- Medical
- Moving
- Other
- Renewable Energy
- Small Business
- Vacation
- Wedding

Sum of delinq\_2yrs by home\_ownership

home_ownership	Sum of delinq_2yrs
Mortgage	50K
Rent	50K
Own	50K
Other	50K
None	50K
Any	50K

Sum of total\_amount\_paid and Sum of funded\_amnt by Year

Page 11 Page 10 Page 12 Page 13 Page 14 Page 15 Page 16 Page 17 Page 18 Page 19 borrower details +

62% Update available (click to download)