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Tugas Data Warehouse & Business Intelegent

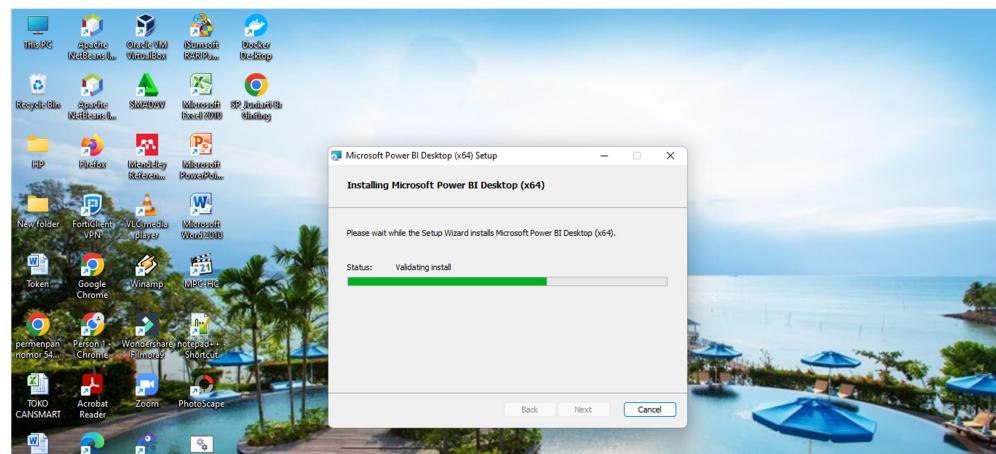
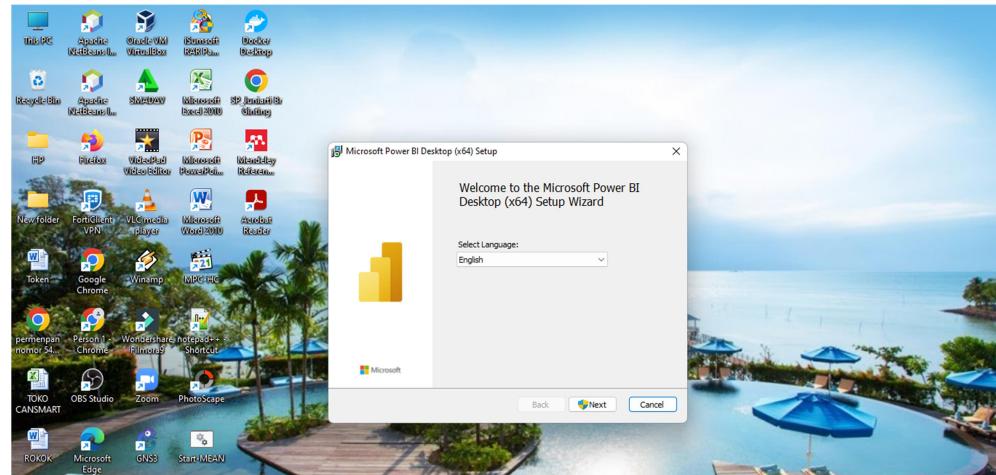
Power BI

Microsoft Power BI adalah kumpulan layanan perangkat lunak, aplikasi, dan konektor yang mengubah sumber data yang tidak terkait menjadi wawasan yang koheren dan interaktif. Power BI memungkinkan analis data terhubung ke sumber data mereka, memvisualisasikan (atau menemukan) apa yang penting, dan membagikan temuan mereka.

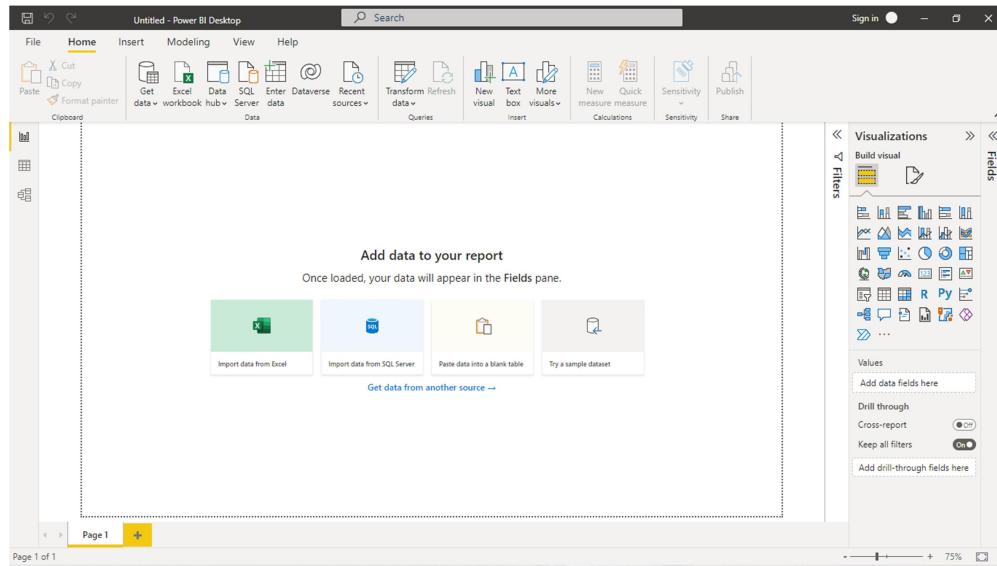
Power BI dapat diinstall melalui link:

<https://go.microsoft.com/fwlink/?LinkID=521662>

Menginstall aplikasi dan Run aplikasi



Tampilan awal aplikasi Power BI

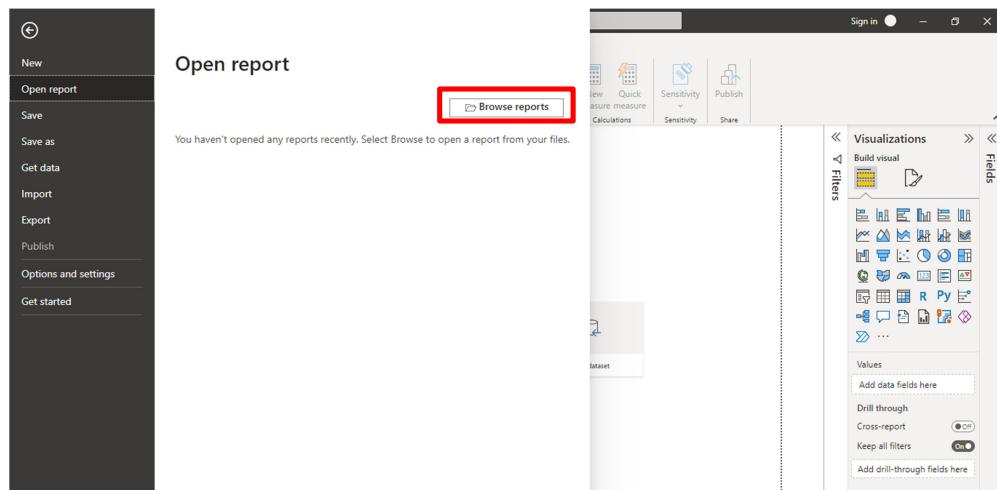


Mulai membangun pada Power BI:

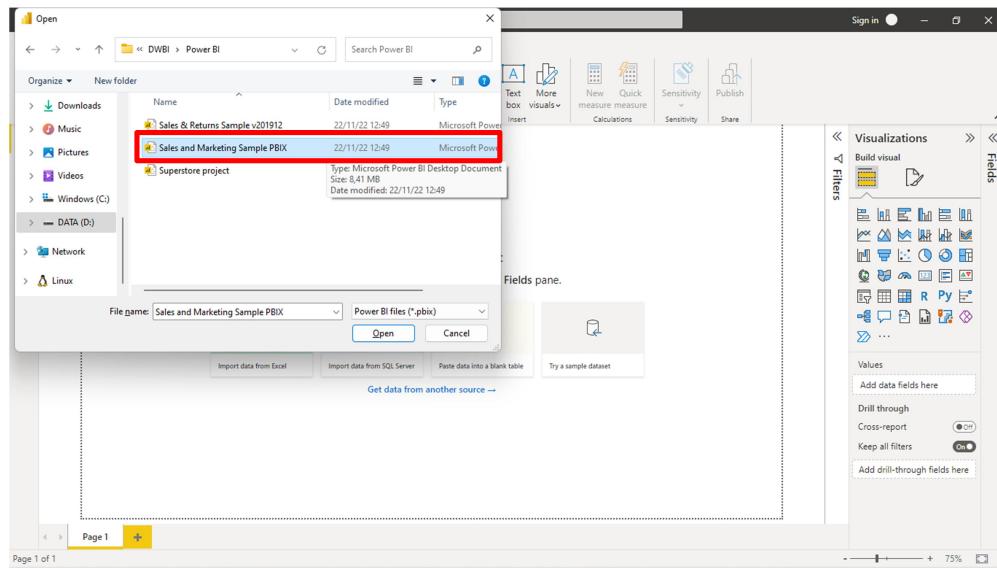
1. Bawa data ke Power BI Desktop, dan buat laporan.
2. Publikasikan ke layanan Power BI, tempat Anda dapat membuat visualisasi baru atau membuat dasbor.
3. Bagikan dasbor dengan orang lain, terutama orang yang sedang dalam perjalanan.
4. Lihat dan berinteraksi dengan dasbor dan laporan bersama di aplikasi Power BI Mobile

Building Blocks of Power BI: Visualizations

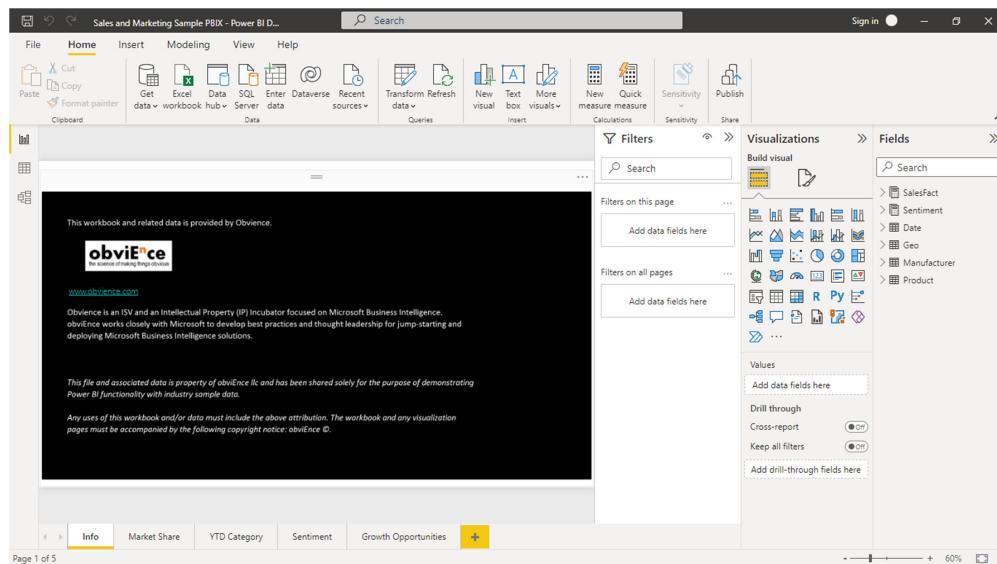
Klik menu “File” dan klik “Open report” dan “Browse Report”



Kemudian Pilih file “Sales and Marketing Sample PBIX”



Tampilan awal setelah menginput file



Untuk menampilkan visualisasi dari data klik Market Share di kiri bawah

Building Blocks of Power BI: Datasets

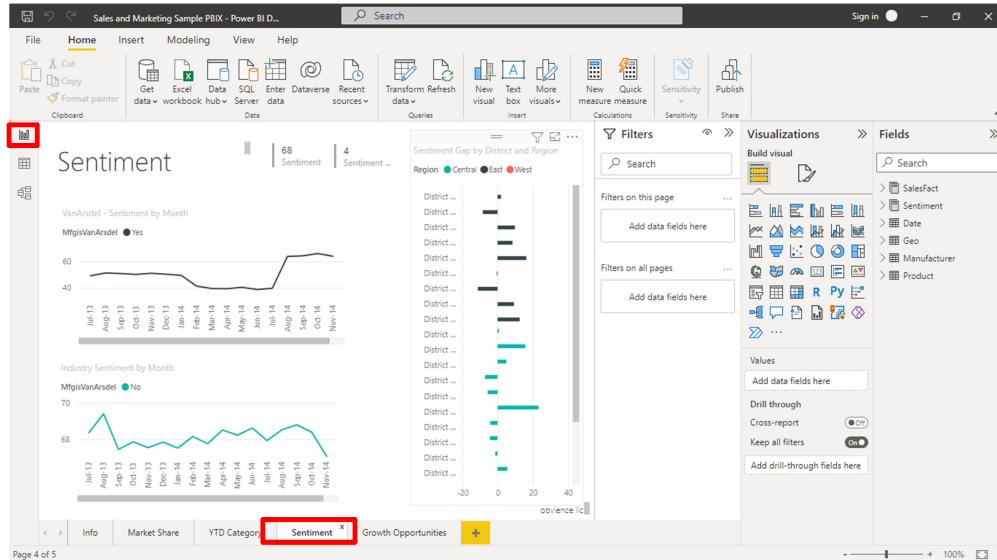
Dataset data adalah kumpulan data yang digunakan Power BI untuk membuat visualisasinya.

Klik icon “Data” pada menu sebelah kiri

Building Blocks of Power BI: Reports

Di Power BI, alaporan adalah kumpulan visualisasi yang muncul bersamaan di satu atau beberapa halaman. Sama seperti laporan lain yang mungkin Anda buat untuk presentasi penjualan atau tugas sekolah, laporan di Power BI adalah kumpulan item yang saling terkait.

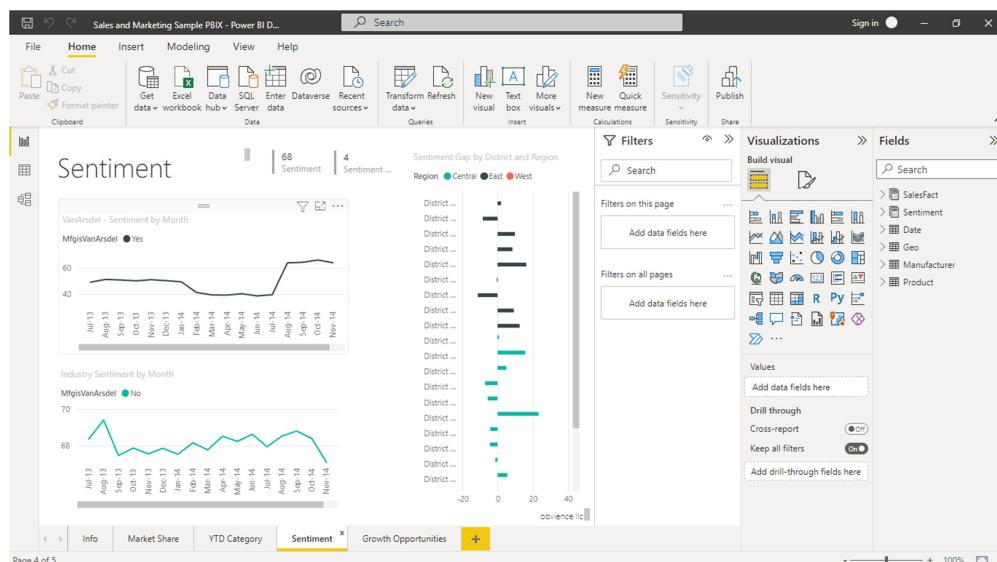
Pada bagian ini kita perlu kembali ke halaman Report dan memilih “Sentiment” pada bar bagian bawah



The screenshot shows the Power BI desktop interface with a report titled "Sentiment". The report includes two line charts: "VanAarsel - Sentiment by Month" and "Industry Sentiment by Month". The "Sentiment" tab is selected in the ribbon. On the right, the "Filters" pane is open, showing various filters applied to the report. A red box highlights the "Filters" pane.

Building Blocks of Power BI: Dashboard and Tiles

Halaman Utama dan Utilities pada Power BI

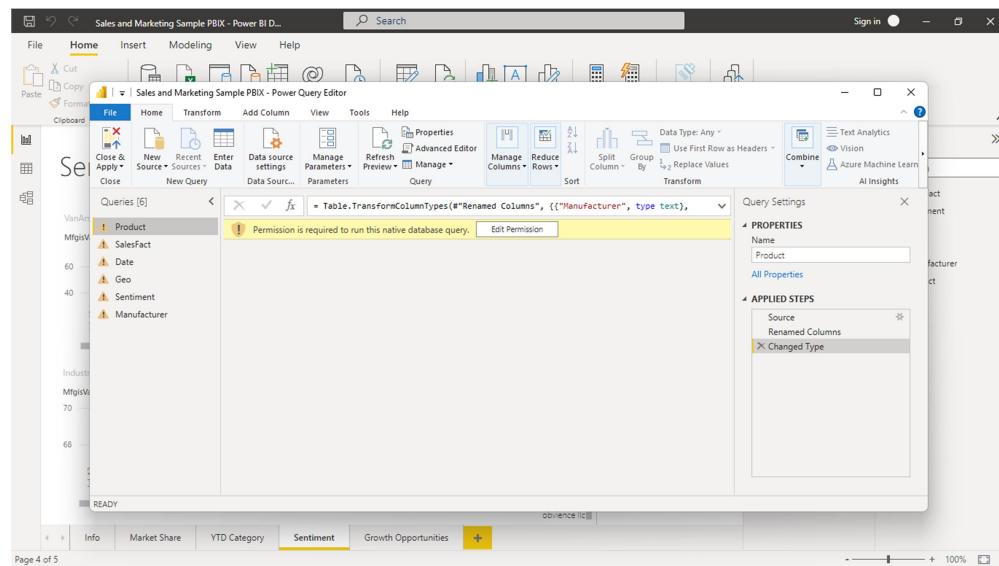


The screenshot shows the Power BI desktop interface with a dashboard titled "Sentiment". It contains the same two line charts as the report above. The "Sentiment" tab is selected in the ribbon. On the right, the "Visualizations" pane is open, showing various visualization options. A red box highlights the "Visualizations" pane.

Load, Clean, and Transform Data in Power BI - I

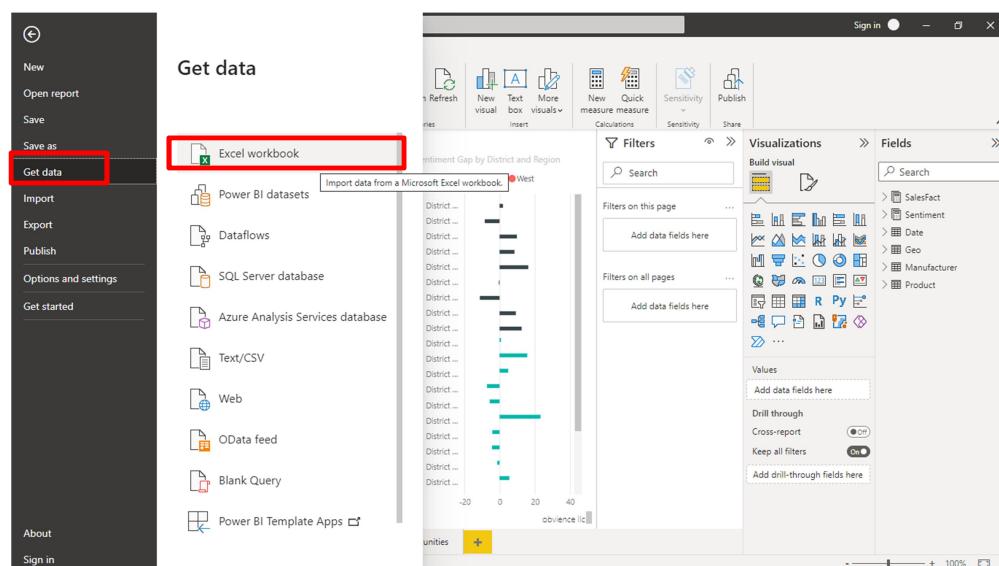
Introduction

Pada halaman “Home”, klik “Transform Data” untuk inisiasi data



Identify Column Headers and Names

Di halaman file klik Get Data dan pilih opsi excel workbook.



Pilih file yang ingin digunakan, disini saya menggunakan file “Financial Sample To Clean”, select table dan klik transform data

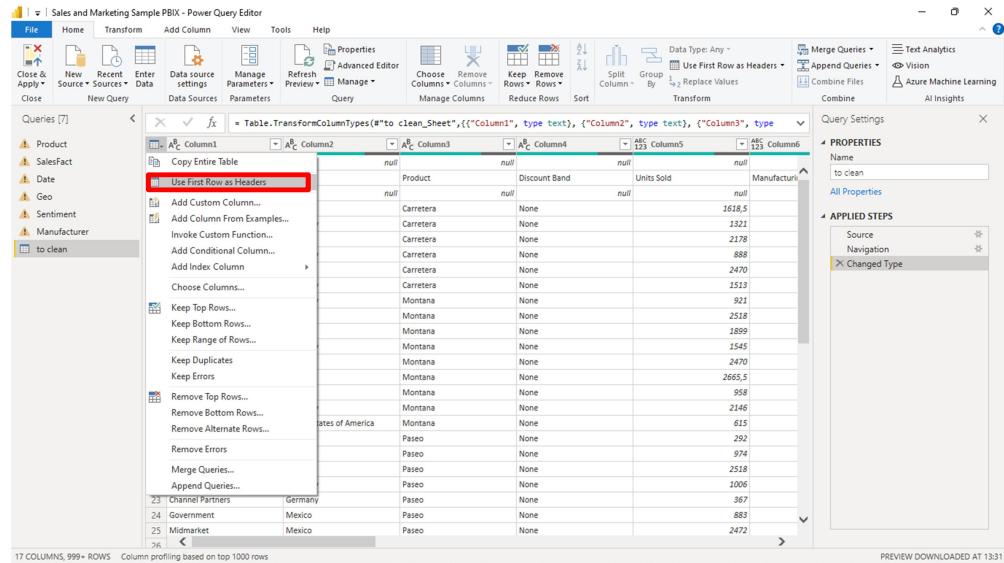
The screenshot shows the Power BI Desktop application window. In the center, the 'Navigator' pane is open, displaying a list of available files: 'Financial Sample To Clean.xlsx [2]' which contains 'Table_1' and 'to clean'. To the right of the Navigator, the 'Fields' pane lists various data sources: SalesFact, Sentiment, Date, Geo, Manufacturer, and Product. Below the Fields pane, the 'Applied Steps' section shows the step 'Changed Type'. The main workspace displays two charts: 'VanAarsdel - Sentiment by Month' and 'Industry Sentiment by Month'. At the bottom of the screen, the status bar indicates 'Page 4 of 5'.

Tampilan Table To Clean

The screenshot shows the Power Query Editor window. The left sidebar lists queries: 'Product', 'SalesFact', 'Date', 'Geo', 'Sentiment', 'Manufacturer', and 'to clean'. The main area displays the 'to clean' table with 26 rows and 6 columns. The columns are labeled 'Column1', 'Column2', 'Column3', 'Column4', 'Column5', and 'Column6'. The first few rows show data such as 'Government' and 'Country'. The 'Applied Steps' pane on the right shows the step 'Changed Type'.

Promote Headers

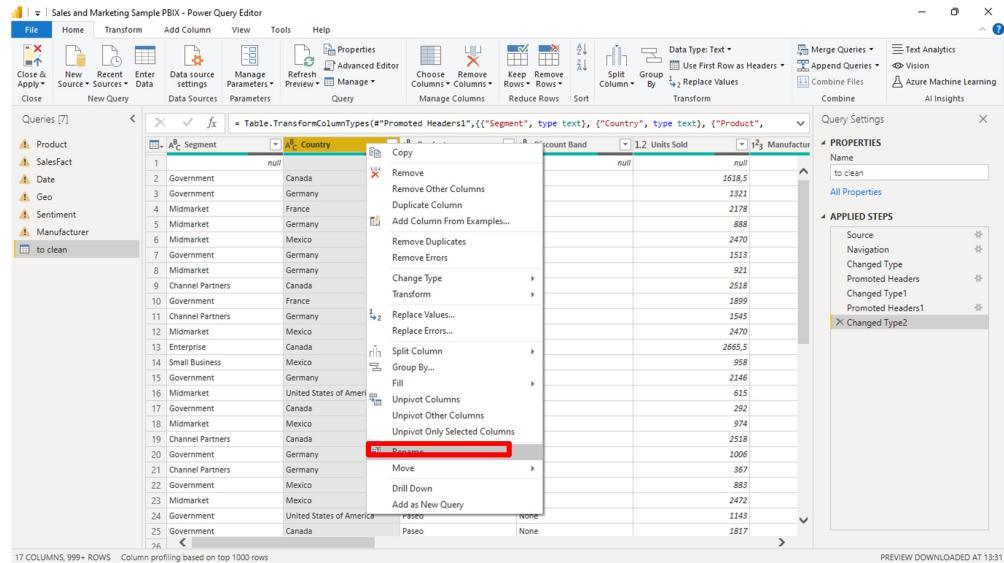
Pada table to clean ini, select use first row as header untuk membuat baris pertama sebagai headernya



The screenshot shows the Power Query Editor interface with a table named "to clean". A context menu is open over the first row of the table, with the option "Use First Row as Headers" highlighted in red. The "APPLIED STEPS" pane on the right shows a step labeled "Changed Type".

Rename Column

Untuk me-rename kolom, klik kanan kemudia pilih “Rename”



The screenshot shows the Power Query Editor interface with a table. A context menu is open over a column header, with the option "Rename" highlighted in red. The "APPLIED STEPS" pane on the right shows steps labeled "Promoted Headers", "Changed Type1", and "Promoted Headers1".

Remove Rows or Columns

Pada bagian ini kita akan menghapus Top Rows atau baris pertama

Untuk menghapus kolom klik kanan pada kolom yang akan dihapus dan klik remove kolom

The screenshot shows the Power Query Editor interface with a table containing 17 columns and 999+ rows. A context menu is open over the 'Country' column, with the 'Remove' option highlighted. The menu also includes options like 'Remove Other Columns', 'Duplicate Column', 'Add Column From Examples...', 'Remove Duplicate', 'Remove Errors', 'Change Type', 'Transform', 'Replace Values...', 'Replace Errors...', 'Split Column', 'Group By...', 'Fill', 'Unpivot Columns', 'Unpivot Other Columns', 'Unpivot Only Selected Columns', 'Rename...', 'Move', 'Drill Down', and 'Add as New Query'. The 'APPLIED STEPS' pane on the right shows steps for 'Renamed Columns' and 'Changed Type2'. The status bar at the bottom indicates 'PREVIEW DOWNLOADED AT 13:31'.

Pivot Columns

Pada column 2 bagian transform , select pivot column

The screenshot shows the Power Query Editor interface with a table containing 17 columns and 700 rows. A context menu is open over the 'Segment' column, with the 'Pivot Column' option highlighted. The menu also includes options like 'Transpose', 'Reverse Rows', 'Detect Data Type', 'Fill', 'Rename', 'Convert to List', 'Merge Columns', 'Split', 'Format', 'Extract', 'Parse', 'Text Column', 'Number Column', and 'Date & Time Column'. The 'APPLIED STEPS' pane on the right shows steps for 'Unpivoted Columns' and 'Renamed Columns'. The status bar at the bottom indicates 'PREVIEW DOWNLOADED AT 13:31'.

Sales and Marketing Sample PBIX - Power Query Editor

APPLIED STEPS

- Pivoted Column

PREVIEW DOWNLOADED AT 13:31

Unpivot Columns

Sama dengan Langkah sebelumnya , klik get data kemudian buka file Finansial Sample Aggregate

Klik table Horizontal, dan klik transform data

Navigator

horizontal

Preview is evaluating...

File Home Help Table tools

Clipboard Data

There are pending changes in your queries that haven't been applied.

Month	January	February	March	April	May	June	July	August	September	October	November	December
2013	0	0	0	0	0	0	0	0	763603,03	1657795,1	765502,3	691564,08
2014	814028,68	1148547,39	669866,87	929984,57	828640,06	1473753,82	923865,68	791066,42	1023132,24	1781585,92	604600,2	2025765,9

Fields

Hapus Kolom Month, klik kanan pada month dan hapus

The screenshot shows the Power Query Editor interface with a table containing columns for Month, January, February, March, April, and May. The 'Month' column is highlighted with a yellow selection bar. A context menu is open over the 'Month' column, with the 'Remove' option being selected.

Select All Column and Unpivot Coloumn

The screenshot shows the Power Query Editor interface with the same table structure. The 'Month' column is again highlighted with a yellow selection bar. A context menu is open over the 'Month' column, with the 'Unpivot Columns' option being selected.

Hasilnya:

The screenshot shows the Power Query Editor interface with the final unpivoted table. The table has two columns: 'Attribute' and 'Value'. The 'Attribute' column lists months from 1 to 12, and the 'Value' column contains corresponding numerical values. The 'APPLIED STEPS' pane on the right shows the 'Unpivot Columns' step was used.

Attribute	Value
1 Month	2013
2 January	0
3 February	0
4 March	0
5 April	0
6 May	0
7 June	0
8 July	0
9 August	0
10 September	763603.03
11 October	765502.3
12 November	691564.08
13 December	814028.68
14 Month	2014
15 January	1148547.39
16 February	669866.87
17 March	929984.57
18 April	0
19 May	0
20 June	0
21 July	0
22 August	0
23 September	0
24 October	0
25 November	0
26 December	0

Setelah itu Pivot Column Profit berdasarkan bulan

Load, Clean, and Transform Data in Power BI – II

Simplify the Data Structure

Pada bagian file klik get data kemudian buka file financial sampel with faults

Pilih Finance Sample, kemudian Transform Data

Sales and Marketing Sample PBIX - Power Query Editor

File Home Transform Add Column View Tools Help

Group Use First Row By as Headers Count Rows Pivot Columns Any Column Text Column Number Column Date & Time Column Date & Time Column R Py Scripts

Queries [12]

Product Salesfact Date Geo Sentiment Manufacturer to clean horizontal (2) to clean (2) to clean (3) Finance Sample

Segment Country Product Discount Band Units Sold Manufacturer

Segment	Country	Product	Discount Band	Units Sold	Manufacturer
1 Government	Canada	Carretera	None	1618.5	
2 Government	Germany	Carretera	None	1321	
3 Midmarket	France	Carretera	None	2178	
4 Midmarket	Germany	Carretera	None	888	
5 Midmarket	Mexico	Carretera	None	2470	
6 Government	Germany	Carretera	None	1513	
7 Midmarket	Germany	Montana	None	921	
8 Channel Partners	Canada	Montana	None	2518	
9 Government	France	Montana	None	1899	
10 Channel Partners	Germany	Montana	None	1545	
11 Midmarket	Mexico	Montana	None	2470	
12 Enterprise	Canada	Montana	None	2665.5	
13 Small Business	Mexico	Montana	None	958	
14 Government	Germany	Montana	None	2146	
15 Enterprise	Canada	Montana	None	345	
16 Midmarket	United States of America	Montana	None	615	
17 Government	Canada	Paseo	None	292	
18 Midmarket	Mexico	Paseo	None	974	
19 Channel Partners	Canada	Paseo	None	2518	
20 Government	Germany	Paseo	None	1006	
21 Channel Partners	Germany	Paseo	None	367	
22 Government	Mexico	Paseo	None	883	
23 Midmarket	France	Paseo	None	549	
24 Small Business	Mexico	Paseo	None	788	
25 Midmarket	Mexico	Paseo	None	2472	

16 COLUMNS, 999 ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED AT 15:14

Pada bagian Queries, rename Finance Sample menjadi Finance Data

Sales and Marketing Sample PBIX - Power Query Editor

File Home Transform Add Column View Tools Help

Group Use First Row By as Headers Count Rows Pivot Columns Any Column Text Column Number Column Date & Time Column Date & Time Column R Py Scripts

Queries [12]

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4 Midmarket	Germany	Carretera	None	888	
5 Midmarket	Mexico	Carretera	None	2470	
6 Government	Germany	Carretera	None	1513	
7 Midmarket	Germany	Montana	None	921	
8 Channel Partners	Canada	Montana	None	2518	
9 Government	France	Montana	None	1899	
10 Channel Partners	Germany	Montana	None	1545	
11 Midmarket	Mexico	Montana	None	2470	
12 Enterprise	Canada	Montana	None	2665.5	
13 Small Business	Mexico	Montana	None	958	
14 Government	Germany	Montana	None	2146	
15 Enterprise	Canada	Montana	None	345	
16 Midmarket	United States of America	Montana	None	615	
17 Government	Canada	Paseo	None	292	
18 Midmarket	Mexico	Paseo	None	974	
19 Channel Partners	Canada	Paseo	None	2518	
20 Government	Germany	Paseo	None	1006	
21 Channel Partners	Germany	Paseo	None	367	
22 Government	Mexico	Paseo	None	883	
23 Midmarket	France	Paseo	None	549	
24 Small Business	Mexico	Paseo	None	788	
25 Midmarket	Mexico	Paseo	None	2472	

16 COLUMNS, 999 ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED AT 15:14

Simplify the Data Structure: Remove Duplicates

Pada kolom Month Name, klik kanan pada kolom dan pilih Remove Duplicates

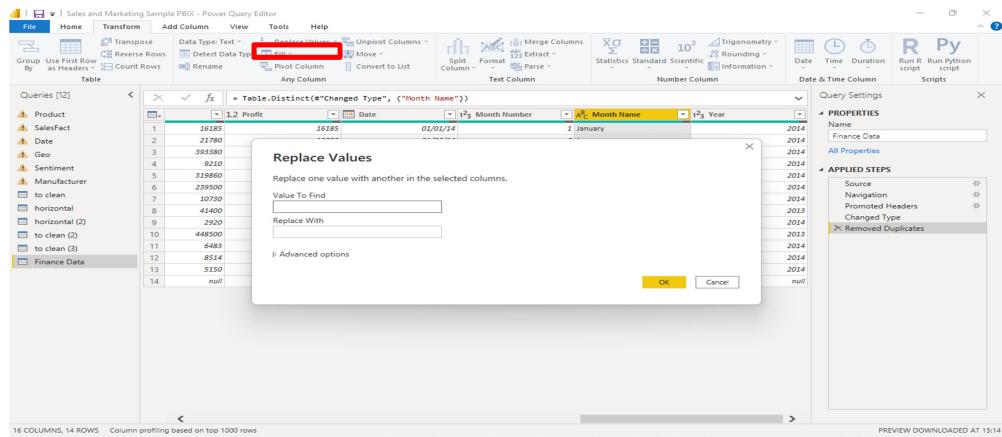
The screenshot shows the Power Query Editor interface with a table containing 16 columns and 999 rows. The 'Month Name' column is selected. A context menu is open over this column, with the 'Remove Duplicates' option highlighted with a red box. Other options in the menu include Copy, Remove, Remove Other Columns, Duplicate Column, Add Column From Examples..., Replace Values..., Change Type, Transform, Replace Errors..., Split Column, Group By..., Fill, Unpivot Columns, Unpivot Other Columns, Unpivot Only Selected Columns, Rename..., Move, Drill Down, and Add as New Query.

Hasilnya akan seperti pada gambar di bawah:

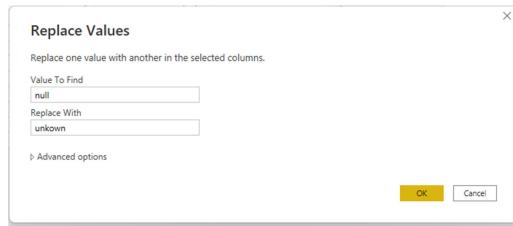
The screenshot shows the Power Query Editor interface with the same table. The 'Month Name' column now contains unique values: January, June, March, December, February, July, August, September, October, November, and May. The 'Year' column also contains unique values: 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004, and 2003. The context menu for the 'Month Name' column is still open, but the 'Remove Duplicates' option is no longer highlighted. The 'APPLIED STEPS' pane shows the step 'Removed Duplicates'.

Simplify the Data Structure: Replace Values

Pada bagian transform, select Replace Values.

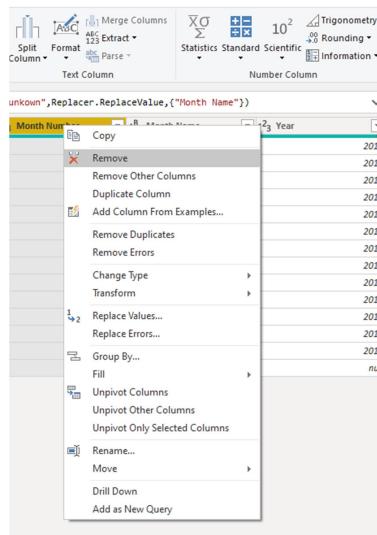


Replace null menjadi Unknown. Klik Ok. Maka data yang bernilai null akan diubah menjadi Unknown



Best Practices for Naming Tables, Columns, and Values

Remove Kolom Month Number.



Selanjutnya rename Month Name menjadi Month

The screenshot shows the Power Query Editor interface with a table containing 15 columns and 14 rows. The table includes columns for COGS, Profit, Date, Month, and Year. The Month column contains categorical values such as 'January', 'June', 'December', etc. The Year column contains numerical values ranging from 2013 to 2014. The Properties pane on the right shows a step named 'Removed Columns'.

Evaluate and Change Column Data Types

Select kolom Manufacturing Price and the Sale Price, setelah itu klik kanan pada kolom. Select Change Type dan ubah tipe dari whole number ke decimal number

The screenshot shows the Power Query Editor interface with a table containing 15 columns and 14 rows. The table includes columns for Country, Product, Discount Band, Units Sold, and Manufacturing. A context menu is open over the 'Manufacturing' column, specifically on the 'Change Type' option, which is highlighted with a red box.

Load, Clean, and Transform Data in Power BI – III

Combine Tables by Appending Queries

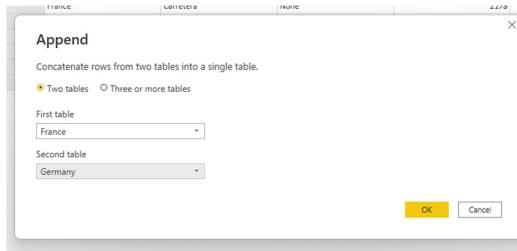
Pada file, klik get data. Setelah itu buka file Financial Sample Combine. Pilih France, Germany dan Mexico kemudian Transfrom data

The screenshot shows the Power BI Data Editor interface. On the left, there's a 'Navigator' pane showing pending changes. In the center, a table named 'Mexico' is displayed with columns: Column1, Column2, Column3, Column4, Column5, Column6, Column15, and others. The 'Fields' pane on the right lists various columns and their properties. At the bottom, there are 'Load', 'Transform Data', and 'Cancel' buttons.

Pada halaman home, pilih Append Queries kemudian Append Queries as new

The screenshot shows the Power BI Query Editor. The ribbon at the top includes 'File', 'Home', 'Transform', 'Add Column', 'View', 'Tools', and 'Help'. The 'Transform' tab is selected. In the main area, a table is shown with columns: Column1, Column2, Column3, Column4, Column5, and Column6. The 'Transform' ribbon tab has several options, and the 'Append Queries as New' option is highlighted with a red box. To the right, there's a 'Merge Queries' section and a 'PRO' query editor.

Append table France and Germany



Kemudian akan muncul query baru , ubah Namanya menjadi France-Germany

Segment	Country	Product	Discount Band	Units Sold	Manufacturer
Midmarket	France	Carretera	None	2178	
Government	France	Montana	None	1899	
Enterprise	France	Velo	None	1804	
Midmarket	France	VTT	None	2178	
Small Business	France	VTT	None	2151	
Government	France	Amarilla	None	2750	
Government	Germany	Carretera	None	1321	
Midmarket	Germany	Carretera	None	888	
Government	Germany	Carretera	None	1513	
Midmarket	Germany	Montana	None	921	
Channel Partners	Germany	Montana	None	1545	
Government	Germany	Montana	None	2146	
Government	Germany	Paseo	None	1006	
Channel Partners	Germany	Paseo	None	367	

Combine Tables by Merging Queries

Klik halaman file kemudian get data dan buka file Retail Database, pilih semua table kemudian Transform data

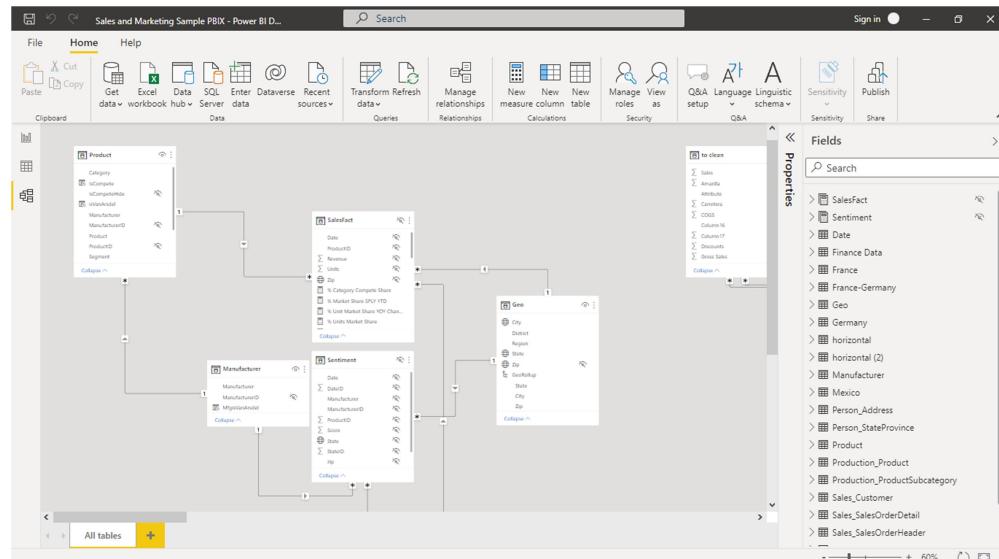
SalesOrderID	RevisionNumber	OrderDate	DueDate	ShipDate	Status
43659	1	01/07/01	13/07/01	08/07/01	
43660	1	01/07/01	13/07/01	08/07/01	
43661	1	01/07/01	13/07/01	08/07/01	
43662	1	01/07/01	13/07/01	08/07/01	
43663	1	01/07/01	13/07/01	08/07/01	
43664	1	01/07/01	13/07/01	08/07/01	
43665	1	01/07/01	13/07/01	08/07/01	
43666	1	01/07/01	13/07/01	08/07/01	
43667	1	01/07/01	13/07/01	08/07/01	
43668	1	01/07/01	13/07/01	08/07/01	
43669	1	01/07/01	13/07/01	08/07/01	
43670	1	01/07/01	13/07/01	08/07/01	
43671	1	01/07/01	13/07/01	08/07/01	
43672	1	01/07/01	13/07/01	08/07/01	
43673	1	01/07/01	13/07/01	08/07/01	
43674	1	01/07/01	13/07/01	08/07/01	
43675	1	01/07/01	13/07/01	08/07/01	

Pada bagian home, pilih merge queries dan pilih queries as new

Inner Sales_SalesOrderHeader dengan Sales_Customer dengan menggunakan CustomerID sebagai penghubung antara kedua table.

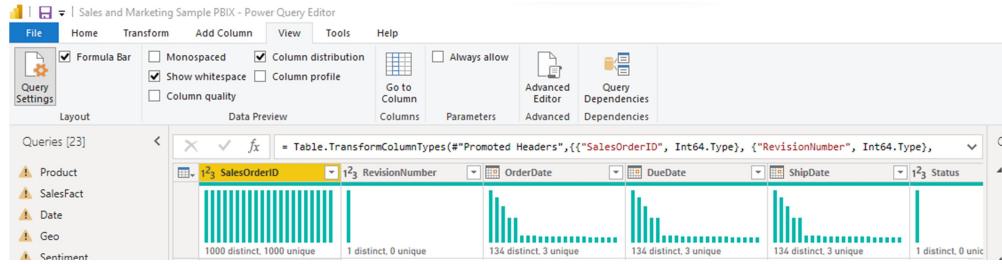
Profiling Data in Power BI: Examining Data Structures

Untuk melihat struktur data yang telah dibuat, pada Power BI Desktop, pilih bagian Model di sebelah kiri atas , disini dapat melihat struktur data yang telah dibuat dalam queries.



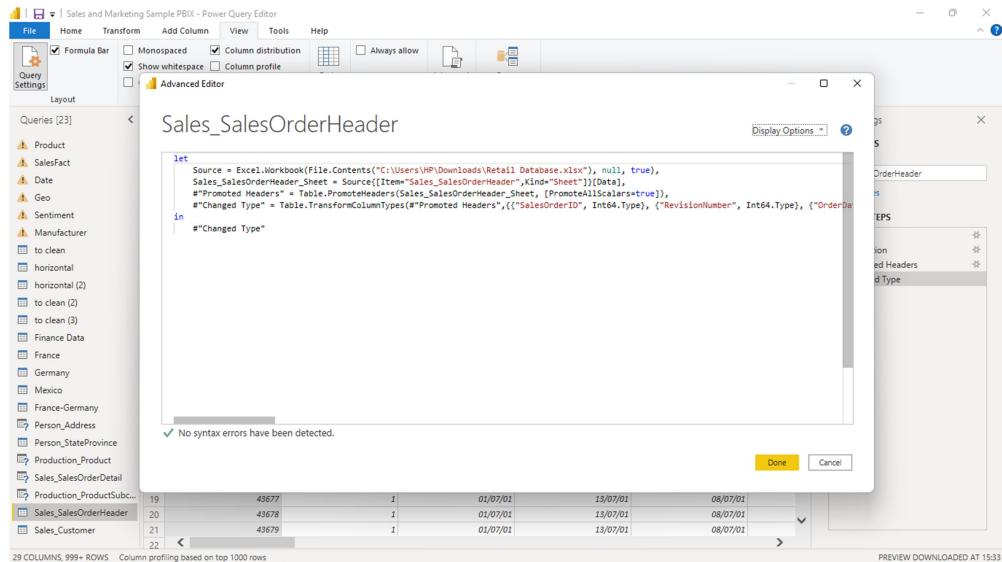
Profiling Data in Power BI: Finding Data Anomalies and Data Statistics

Pada view pilih column distribution , column ini menampilkan distribusi data dalam kolom dan jumlah nilai, kita dapat mengetahui detail jumlah data yang diperhitungkan, nilai yang berbeda yaitu semua nilai dalam kolom termasuk juga duplikat dan nilai nol



Using Advanced Editor to Modify M Code

Menggunakan Editor Tingkat Lanjut untuk Memodifikasi Kode M Pada view, pilih advance editor



Setiap kali Anda membentuk data di Power Query, Anda membuat langkah dalam proses Power Query. Langkah - langkah tersebut dapat disusun ulang, dihapus, dan dimodifikasi jika memungkinkan. Setiap langkah pembersihan yang Anda buat kemungkinan dibuat dengan menggunakan antarmuka grafis. Setiap langkah Power Query secara kasar akan sejajar dengan satu atau dua baris menjadi ahli dalam kode M untuk dapat membacanya. Anda bahkan dapat bereksperimen dengan mengubahnya. Misalnya, jika Anda perlu mengubah nama database, Anda dapat melakukannya langsung di kode kemudian selesai.