

Nama : Arief Lindung

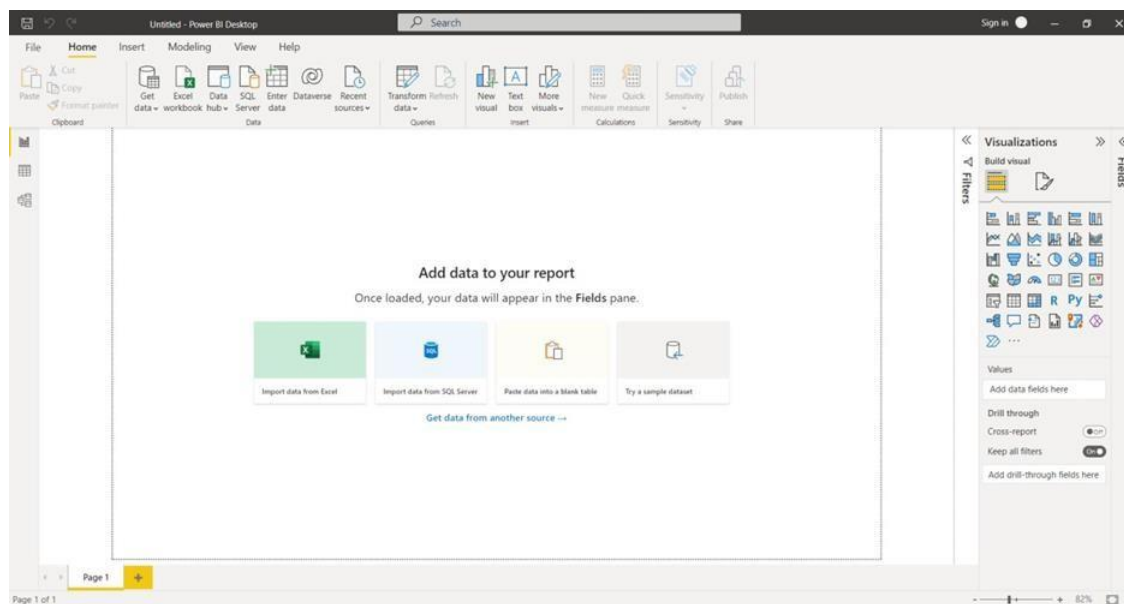
NIM : 191402093

Kom : C

## Microsoft Power BI

PowerBI adalah produk software dari Microsoft yang berfungsi untuk menggabungkan, menganalisis, membuat visualisasi, dan membagikan data. Fitur-fitur tersebut ditampilkan dalam dashboard yang terlihat simpel dan mudah dipahami. Power BI juga terintegrasi dengan produk-produk Microsoft lainnya, seperti Excel, Azure, dan lain-lain.

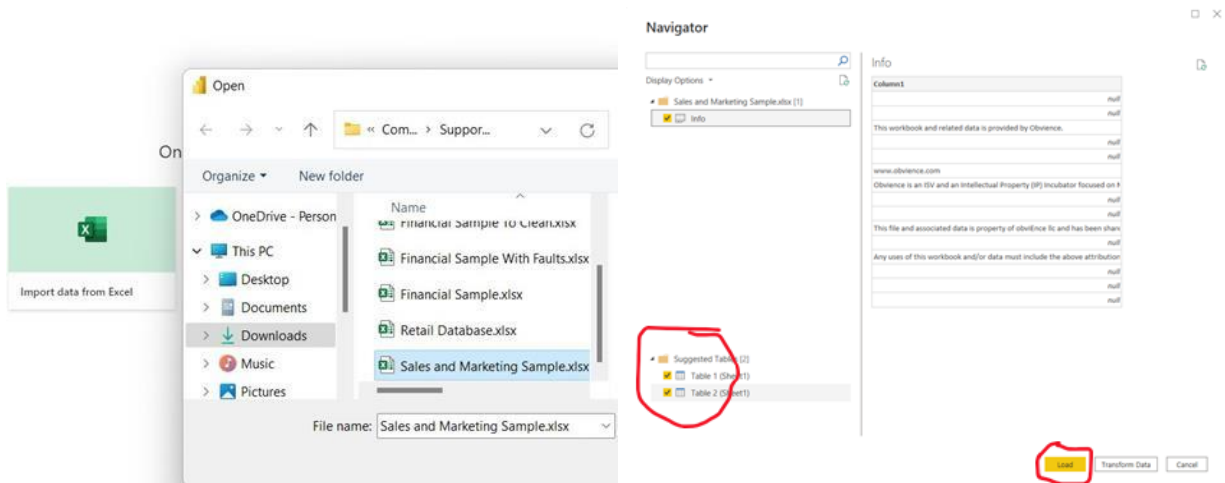
- **Tampilan Halaman Awal dari Power BI**



Pada halaman awal dapat dilihat semua fitur-fitur yang ada di Power BI. Tampilannya yang sederhana membantu pengguna untuk memahami cara menggunakan Power BI.

- **Input Data**

Cara melakukan input data dalam Power BI adalah dengan mengklik Button Get Data pada PowerBI, lalu klik Import Data From Excel, Select Table, dan data berhasil diinput kedalam PowerBI.



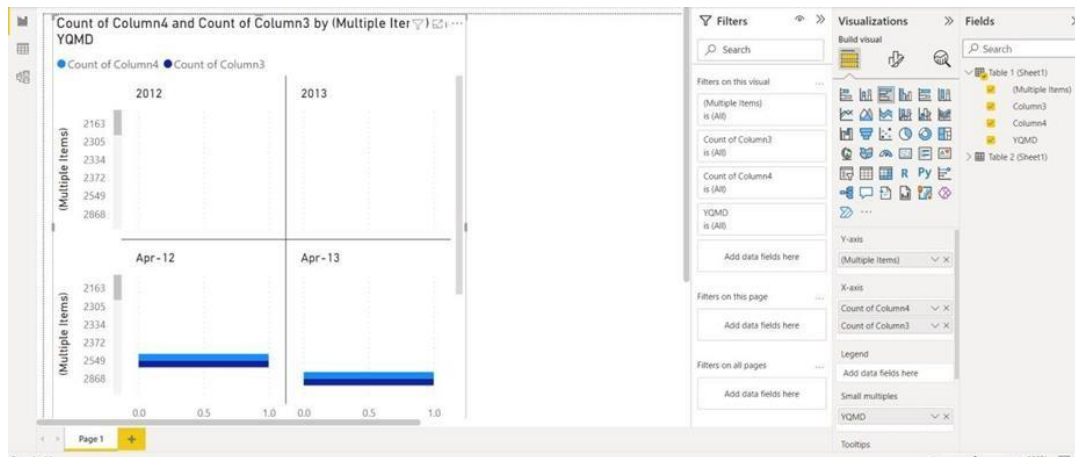
PowerBI sendiri memiliki banyak fitur seperti Visualisasi Data, Transform Isi data, dsb.

- **Melihat Isi Data**

The image shows the Power BI Desktop interface with the 'Table tools' ribbon selected. The table displayed has the following data:

YQMD	(Multiple Items)	Column3	Column4
Region	All		
Row Labels	Total Units	Total Units R12Ms	Total Units YTD
2012	49058	49058	49058
Jan-12	4327	48565	4327
Feb-12	4235	48343	8562
Mar-12	3262	48181	11824
Apr-12	2549	47936	14373
May-12	2334	48027	16707
Jun-12	3438	48112	20145

- Visualisasi Data



- Power Query Editor yang memiliki fungsi untuk mengolah data dengan mudah pada PowerBI

	YQMD	Count of Column3	Count of Column4	Count of Column4
1	2012	49058	49058	49058
2	Jan-12	4327	48565	4327
3	Feb-12	4245	48142	4245
4	Mar-12	3260	48181	11824
5	Apr-12	2549	47938	14379
6	May-12	2334	48027	16707
7	Jun-12	3438	48112	20143
8	Jul-12	2305	48586	22410
9	Aug-12	3270	49003	25720
10	Sep-12	6457	48784	32177
11	Oct-12	5860	48983	37837
12	Nov-12	5893	49080	43730
13	Dec-12	5328	49058	49058
14	2013	47250	47250	47250
15	Jan-13	4202	48933	4202
16	Feb-13	4034	48762	4034
17	Mar-13	3407	48679	11841
18	Apr-13	2888	49194	14529
19	May-13	2372	49232	16881
20	Jun-13	3564	49358	20443
21	Jul-13	2163	49216	22608
22	Aug-13	2874	48820	25482
23	Sep-13	4915	47278	30897
24	Oct-13	5560	47178	35957
25	Nov-13	5881	47266	41938
26	Dec-13	5312	47250	47250
27	Grand Total	96308	47250	47250

- Menghapus data Yang tidak Perlu

Navigator

Display Options ▾

Financial Sample To Clean.xlsx [2]

Table\_1

☒ to clean

to clean

Column1	Column2	Column3	Column4	Col
	null	null	null	null
Segment	Country	Product	Discount Band	
	null	null	null	null
Government	Canada	Carretera	None	
Government	Germany	Carretera	None	
Midmarket	France	Carretera	None	
Midmarket	Germany	Carretera	None	
Midmarket	Mexico	Carretera	None	
Government	Germany	Carretera	None	
Midmarket	Germany	Montana	None	
Channel Partners	Canada	Montana	None	
Government	France	Montana	None	
Channel Partners	Germany	Montana	None	
Midmarket	Mexico	Montana	None	
Enterprise	Canada	Montana	None	
Small Business	Mexico	Montana	None	
Government	Germany	Montana	None	
Midmarket	United States of America	Montana	None	
Government	Canada	Paseo	None	
Midmarket	Mexico	Paseo	None	
Channel Partners	Canada	Paseo	None	
Government	Germany	Paseo	None	
Channel Partners	Germany	Paseo	None	

Load

Transform Data

Cancel

- Masukkan data kedalam Tabel

Untitled - Power Query Editor

File Home Transform Add Column View Tools Help

Group By

Use First Row as Headers

Count Rows

Table

Transpose

Reverse Rows

Reverse Columns

Count Rows

Table

Data Type: Text

Replace Values

Unpivot Columns

Move

Split Column

Format

Extract

Parse

Statistics

Standard Scientific

Information

Trigonometry

Rounding

Date

Time

Duration

Run R script

Run Python script

Any Column

Any Column

Text Column

Number Column

Date & Time Column

Queries [3]

Table 1 (Sheet1)

Table 2 (Sheet1)

to clean

Table.TransformColumnTypes(\*to clean\_Sheet1,{{"Column1", type text}, {"Column2", type text}, {"Column3", type text}, {"Column4", type text}, {"Column5", type text}, {"Column6", type text}, {"Column7", type text}})

Column1	Column2	Column3	Column4	Column5	Column6	Column7
1	null	null	null	null	null	null
2	Segment	Country	Product	Discount Band	Units Sold	Manufacturing Price
3		null	null	null	null	null
4	Government	Canada	Carretera	None	1618.5	3
5	Government	Germany	Carretera	None	1321	3
6	Midmarket	France	Carretera	None	2178	3
7	Midmarket	Germany	Carretera	None	888	3
8	Midmarket	Mexico	Carretera	None	2470	3
9	Government	Germany	Carretera	None	1513	3
10	Midmarket	Germany	Montana	None	921	5
11	Channel Partners	Canada	Montana	None	2518	5
12	Government	France	Montana	None	1899	5
13	Channel Partners	Germany	Montana	None	1545	5
14	Midmarket	Mexico	Montana	None	2470	5
15	Enterprise	Canada	Montana	None	2665.5	5

- Disini data belum memiliki Label, untuk membuat label pada data kita bisa menekan Tombol use first row as Headers hingga Data dapat Dilabel dengan sempurna

fx = Table.TransformColumnTypes(#"Promoted Headers1",{{"Segment", type text}, {"Country", type text}, {"Product", type text}, {"Discount Band", type text}, {"Units Sold", type number}, {"Manufacturing Price", type number}, {"Sale Price", type number})

Segment	Country	Product	Discount Band	Units Sold	Manufacturing Price	Sale Price
1						
2	Government	Canada	Carretera	None	1618,5	3
3	Government	Germany	Carretera	None	1321	3
4	Midmarket	France	Carretera	None	2178	3
5	Midmarket	Germany	Carretera	None	888	3
6	Midmarket	Mexico	Carretera	None	2470	3
7	Government	Germany	Carretera	None	1513	3
8	Midmarket	Germany	Montana	None	921	5
9	Channel Partners	Canada	Montana	None	2518	5
10	Government	France	Montana	None	1899	5
11	Channel Partners	Germany	Montana	None	1545	5
12	Midmarket	Mexico	Montana	None	2470	5
13	Enterprise	Canada	Montana	None	2665,5	5

- Ketika posisi header data sudah pas, data bisa lebih mudah diolah. Namun disini terdapat kendala dimana ada baris null pada data, untuk menghapus baris null dapat dilakukan dengan menekan tombol Remove Rows, lalu menekan tombol Remove Top Rows

fx = Table.RenameColumns(#"Changed Type2",{{"Month Info", "Month", "Year", "Year"}})

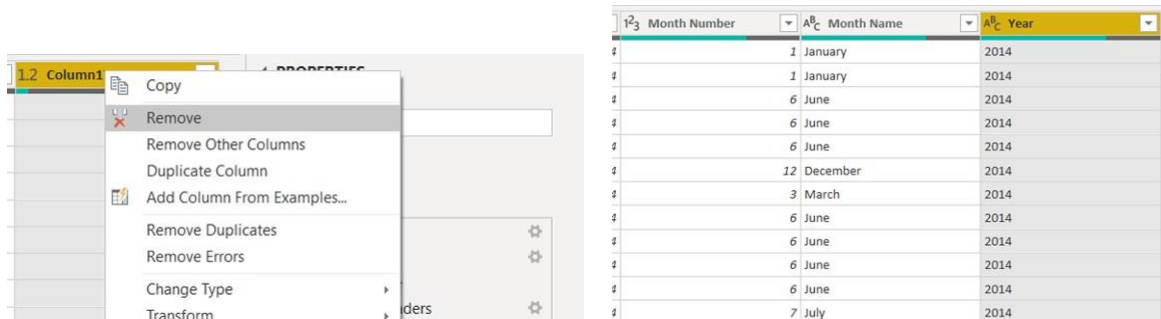
Profit	Date	Month	Year	Column17
1				
2	16185	01/01/2014	2014	814028,68
3	13210	01/01/2014	2014	814028,68
4	21780	01/06/2014	2014	1473753,82
5	8880	01/06/2014	2014	1473753,82
6	24700	01/06/2014	2014	1473753,82
7	393380	01/12/2014	2014	2717329,98
8	9210	01/03/2014	2014	669866,87
9	7554	01/06/2014	2014	1473753,82

- Setelah data diremove, bis akita lihat tampilan data sesuai dengan yang dibawah ini

fx = Table.Skip(#"Renamed Columns",1)

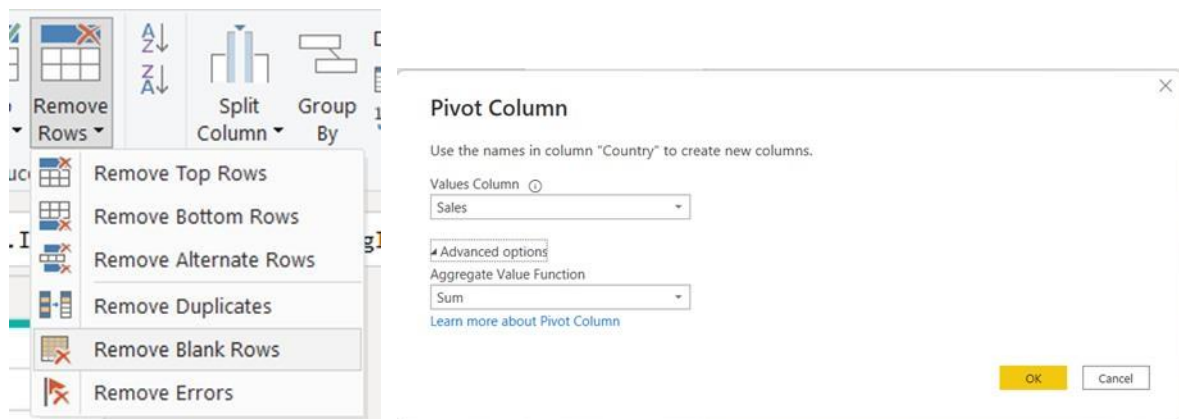
Segment	Country	Product	Discount Band	Units Sold	Manufacturing Price	Sale Price
1	Government	Canada	Carretera	None	1618,5	3
2	Government	Germany	Carretera	None	1321	3
3	Midmarket	France	Carretera	None	2178	3
4	Midmarket	Germany	Carretera	None	888	3
5	Midmarket	Mexico	Carretera	None	2470	3
6	Government	Germany	Carretera	None	1513	3
7	Midmarket	Germany	Montana	None	921	5
8	Channel Partners	Canada	Montana	None	2518	5
9	Government	France	Montana	None	1899	5
10	Channel Partners	Germany	Montana	None	1545	5
11	Midmarket	Mexico	Montana	None	2470	5
12	Enterprise	Canada	Montana	None	2665,5	5

- Pada Akhir data, terdapat Kolom yang tidak berlabel dan berisikan data, untuk menghapus kolom tersebut dapat menekan kolom yang dihapus dan drop kolom dengan klik Remove Columns



## • Pivoting Data

Setelah data diolah, kita akan menyatukan data (Pivoting Data) agar data lebih terstruktur dan mudah untuk diolah. Sebelum melakukan Pivoting data, kita harus menghapus variabel kosong (null) dengan cara drop table yang berisikan data null.



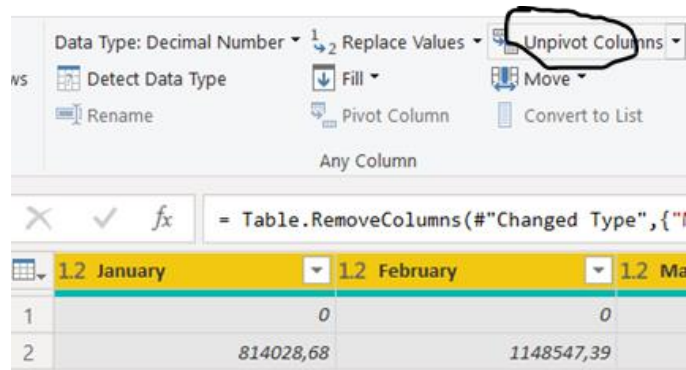
## • Remove Data

Setelah data selesai di Pivot, tampilan data menjadi seperti ini.

= Table.Pivot(#"Removed Blank Rows", List.Distinct(#"Removed Blank Rows"[Country]), "Country", "Sales", List.Sum)						
Segment	Canada	Germany	France	Mexico	United States of America	
1 Channel Partners	491164,14	336425,88	372090,36	234379,08	366534,18	
2 Enterprise	3967491,25	4086826,25	3890890,625	3315881,25	4350605	
3 Government	10741236,52	11452895,94	12127782,72	9791599,38	8390746,11	
4 Midmarket	510213,975	301344,75	593802,075	511136,4	465385,875	
5 Small Business	9177549	7327848	7369606,5	7096356	11456559	

- **Unpivoting Data**

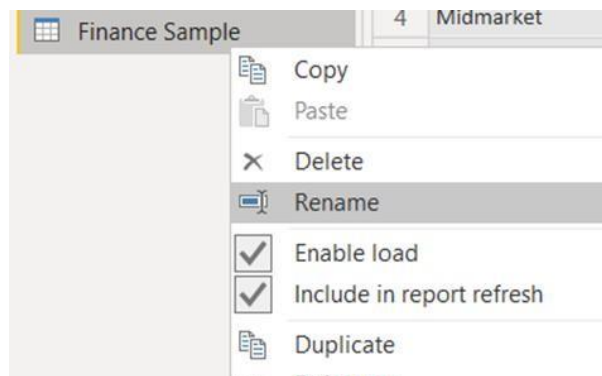
Ada beberapa jenis data yang terlanjur di Pivot namun setelah di Pivot data tidak bisa diolah dan harus dilakukan Unpivoting data. Untuk Mengunpivot data bisa dengan mengklik Transform, lalu Unpivot data



	1.2 Attribute	1.2 Value
1	January	0
2	February	0
3	March	0
4	April	0
5	May	0
6	June	0
7	July	0
8	August	0
9	September	763603,03
10	October	1657795,1
11	November	765502,3
12	December	601551,08

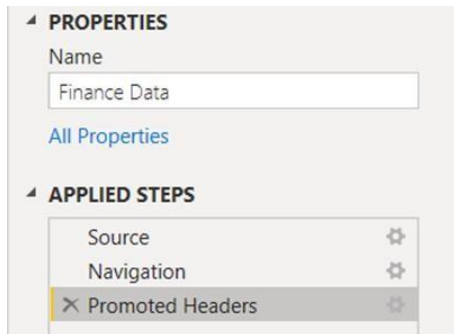
- **Rename Table**

Table bisa direname dengan klik kanan lalu Rename Table.



- **Step Back (Redo)**

Ada kalanya kita harus me-Redo data yang sudah diolah, untuk mengembalikan data keposisi awal bisa dengan klik tanda silang dibawah ini.



- **Change Data Value**

Untuk mengubah/memperbaiki Value data, bisa dengan mengklik Replace Values, lalu mengubah value seperti dibawah ini.

December	2014
December	2014
Mach	2014
May	2014

Replace Values

Replace one value with another in the selected columns.

Value To Find

Mach

Replace With

March

> Advanced options

## Replace Values

Replace one value with another in the selected columns.

Value To Find

null

Replace With

Unknown

Advanced options

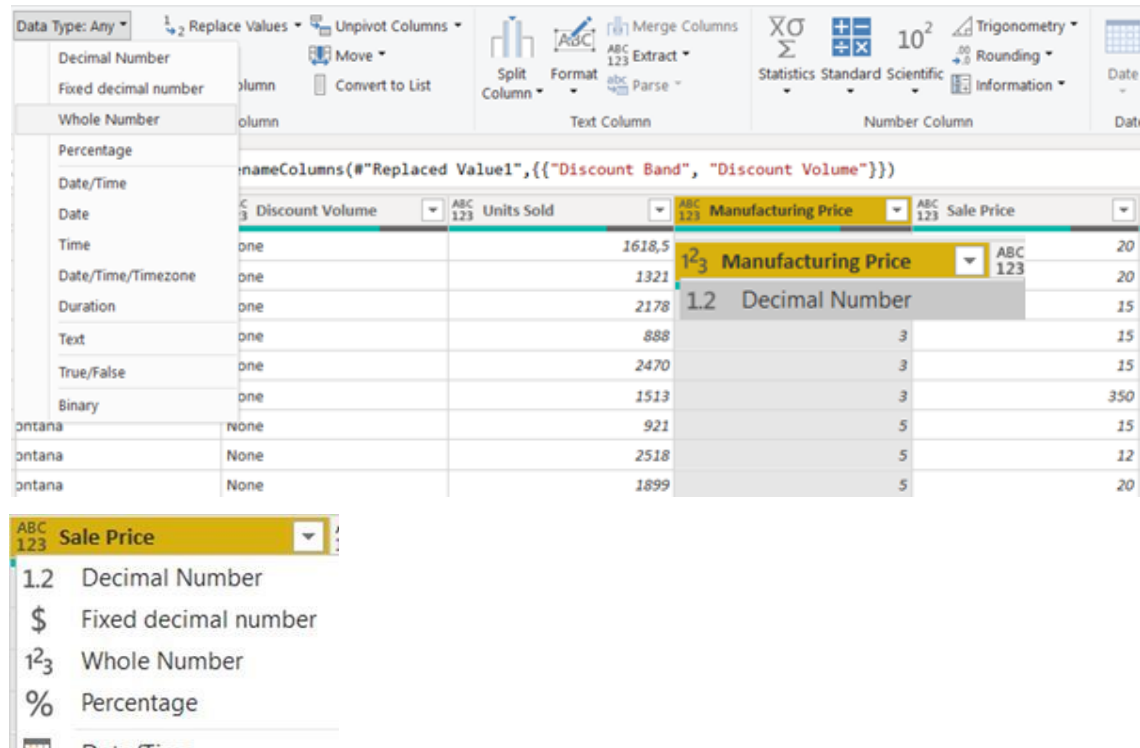
OK Cancel

[illegible]



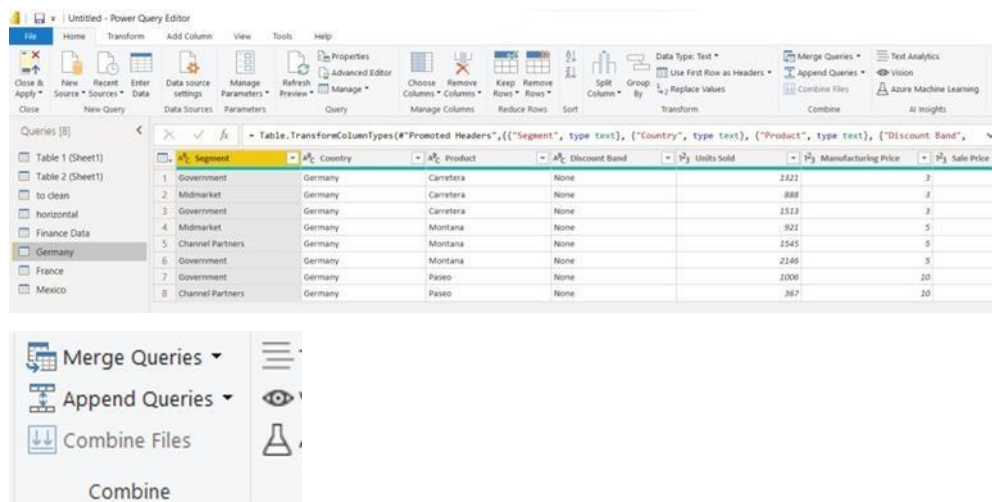
- **Jenis Table**

Jenis Table yang diinput dalam PowerBI adalah berbentuk text, dimana jika table berbentuk text angka yang terdapat didalamnya tidak bisa diolah. Untuk mengolahnya, kita bisa mengubah table yang berjenis Text menjadi Decimal Number dengan cara dibawah ini



- **Merge Data**

Pada PowerBI, terdapat fitur untuk menggabungkan 2 buah tabel yaitu merge dan append table. Append table adalah mensisipkan table ke table utama



## Append

Concatenate rows from three or more tables into a single table.

☐ Two tables ☒ Three or more tables

Available tables

Germany (Current)  
Table 1 (Sheet1)  
Table 2 (Sheet1)  
to clean  
horizontal  
Finance Data  
France  
Mexico

Add >>

Tables to append

Germany (Current)

Tables to append

Germany (Current)  
France

OK

Cancel

Table.Combine({#"Changed Type", France})						
Segment	Country	Product	Discount Band	Units Sold	Manufacturing Price	Sale Price
1 Government	Germany	Carretera	None	1222	8	
2 Midmarket	Germany	Carretera	None	888	8	
3 Government	Germany	Carretera	None	1513	8	
4 Midmarket	Germany	Montana	None	921	5	
5 Channel Partners	Germany	Montana	None	1545	5	
6 Government	Germany	Montana	None	2145	5	
7 Government	Germany	Paseo	None	1006	10	
8 Channel Partners	Germany	Paseo	None	367	10	
9 Midmarket	France	Carretera	None	2178	3	
10 Government	France	Montana	None	1899	5	
11 Enterprise	France	Vello	None	1804	220	
12 Midmarket	France	VTT	None	2178	250	
13 Small Business	France	VTT	None	2151	250	
14 Government	France	Amarilla	None	2750	260	

Bisa kita lihat tabel France sudah disisip kedalam table Germany. Jangan lupa untuk merename table menjadi France-Germany

France-Germany	5	C
France	6	C
Mexico	7	C
Query1	8	C
	9	M

Disini saya juga memasukkan table Mexico didalam, namun bisa dilihat data dari Table Mexico bersikan null. Untuk drop isi data table mexico bisa menekan tombol X pada Applied Steps

Segment	Country	Product	Discount Band	Units Sold	Manufacturing Price	Sale Price
1 Government	Germany	Carretera	None	1321	3	
2 Midmarket	Germany	Carretera	None	888	3	
3 Government	Germany	Carretera	None	1513	3	
4 Midmarket	Germany	Montana	None	921	5	
5 Channel Partners	Germany	Montana	None	1545	5	
6 Government	Germany	Montana	None	2146	5	
7 Government	Germany	Paseo	None	1006	10	
8 Channel Partners	Germany	Paseo	None	367	10	
9 Midmarket	France	Carretera	None	2178	3	
10 Government	France	Montana	None	1899	5	
11 Enterprise	France	Velo	None	1804	120	
12 Midmarket	France	VTT	None	2178	250	
13 Small Business	France	VTT	None	2151	250	
14 Government	France	Amarilla	None	2750	260	
15	null	null	null	null	null	null
16	null	null	null	null	null	null
17	null	null	null	null	null	null
18	null	null	null	null	null	null
19	null	null	null	null	null	null
20	null	null	null	null	null	null

PROPERTIES

Name  
Germany

All Properties

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Appended Query

Appended Query?

Table.Combine({#"Changed Type", France})

Segment	Country	Product	Discount Band	Units Sold	Manufacturing Price	Sale Price
1 Government	Germany	Carretera	None	1321	3	
2 Midmarket	Germany	Carretera	None	888	3	
3 Government	Germany	Carretera	None	1513	3	
4 Midmarket	Germany	Montana	None	921	5	
5 Channel Partners	Germany	Montana	None	1545	5	
6 Government	Germany	Montana	None	2146	5	
7 Government	Germany	Paseo	None	1006	10	
8 Channel Partners	Germany	Paseo	None	367	10	
9 Midmarket	France	Carretera	None	2178	3	
10 Government	France	Montana	None	1899	5	
11 Enterprise	France	Velo	None	1804	120	
12 Midmarket	France	VTT	None	2178	250	
13 Small Business	France	VTT	None	2151	250	
14 Government	France	Amarilla	None	2750	260	

Query Settings

PROPERTIES

Name  
France-Germany

All Properties

APPLIED STEPS

Source

Navigation

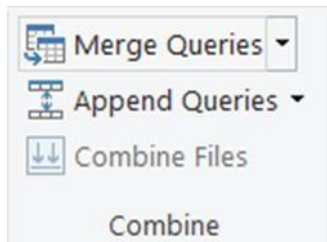
Promoted Headers

Changed Type

Appended Query

- **Merge Table**

Merge Table ialah menyatukan 2 buah jenis table kedalam 1 Table. Bisa dilakukan dengan menekan tombol Merge Queries



**Merge**

Select a table and matching columns to create a merged table.

Sales\_SalesOrderHeader (2)

PurchaseOrderNumber	AccountNumber	CustomerID	ContactID	SalesPersonID	TerritoryID	BillToA
PO522145787	10-4020-000676	676	378	279	5	
PO18850127500	10-4020-000117	117	216	279	5	
PO18473189620	10-4020-000442	442	281	282	6	
PO18444174044	10-4020-000227	227	564	282	6	

Sales\_Customer

CustomerID	TerritoryID	AccountNumber	CustomerType	rowguid	Mod
1	1	AW00000001	S	{3F5AE95E-B87D-4AED-95B4-C3797AFCB74F}	13/10/
2	1	AW00000002	S	{E552F657-A9AF-4A7D-A645-C429D6E02491}	13/10/
3	4	AW00000003	S	{130774B1-DB21-4EF3-98C8-C104BCD6ED6D}	13/10/
4	4	AW00000004	S	{FF862851-1DAA-4044-BE7C-3E85583C054D}	13/10/

Join Kind  
Inner (only matching rows)

☐ Use fuzzy matching to perform the merge

☒ Fuzzy matching options  
 Similarity threshold (optional)

☒ Ignore case  
☒ Match by combining text parts

✓ The selection matches 5199 of 5199 rows from the first table, and 4173 of...

OK Cancel

Untuk menggabungkan 2 buah jenis table, kita harus melihat persamaan dari kedua dataset table tersebut. Bisa dilihat kalau kedua data memiliki kesamaan pada CustomerID sehingga data dicluster dan diurutkan dengan menjadikan CustomerID sebagai patokan data dan berikut hasil data Ketika sudah di Merge

ABC 123	Comment	rowguid	ModifiedDate	ContactFirstName	ContactLastName	Sales_Customer
		null {79B65321-39CA-4115-9CBA-8FE0903E12E...	08/07/2001	James	Hendergart	Table
		null {AE51074C-108B-4274-BB03-87D6700DB2...	08/10/2001	James	Hendergart	Table
		null {270EB149-81E2-4564-9CA6-8A4502C08A...	08/01/2002	James	Hendergart	Table
		null {5943CC34-50C6-4CBB-80CB-4DE01571E5...	08/04/2002	James	Hendergart	Table
		null {039F4B9C-19AC-4B60-B6B2-A5D66459A2...	08/07/2002	James	Hendergart	Table
		null {0D6915F7-F25B-4310-9BB6-E68222CE25A...	08/10/2002	James	Hendergart	Table
		null {10354519-180B-40B8-8FC1-347DE19B541...	08/01/2003	James	Hendergart	Table
		null {D2745233-B05B-409C-93BB-4451569F42...	08/08/2001	Orlando	Gee	Table
		null {1A116F86-71E4-40A2-A32C-4938D8977D...	08/11/2001	Orlando	Gee	Table
		null {F57AB920-675E-4B1D-B43C-8EA091CF6F...	08/02/2002	Orlando	Gee	Table
		null {62991BDA-C42D-494F-9EF1-2754BEC25F...	08/05/2002	Orlando	Gee	Table
		null {738DC42D-D03B-48A1-9822-F95A67EA73...	08/07/2001	Takiko	Collins	Table
		null {BB901788-017A-4714-8E6A-717A64299D...	08/10/2002	Takiko	Collins	Table
		null {8A533BE6-0669-470A-B361-796DD1CDOE...	08/08/2002	Keith	Harris	Table
		null {1FAAD98B-1DE0-4B80-A804-9F8B86F289...	08/11/2002	Keith	Harris	Table
		null {D91B9131-18A4-4A11-BC3A-90B6F53E9D...	08/07/2001	Jauna	Elson	Table
		null {181D7624-F907-41B6-90B8-B95899CA2B...	08/10/2001	Jauna	Elson	Table
		null {2C419B24-B1F6-4D9D-B2BF-1E68389B47...	08/01/2002	Jauna	Elson	Table
		null {E2DB78F0-AB7A-4755-87BE-ED52B478A8...	08/04/2002	Jauna	Elson	Table
		null {61DF816F-0422-4A7A-9F94-C50FF7FF4D5...	08/07/2002	Jauna	Elson	Table
		null {EE498ACF-F522-4937-AB69-BAD7D86ADE...	08/10/2002	Jauna	Elson	Table
		null {9D07E19C-0672-42E6-BC61-765BCDED32...	08/01/2003	Jauna	Elson	Table
		null {0F0EB783-FA76-466D-9A0A-2F88C1C7ED...	08/09/2001	Donna	Carreras	Table
		null {9718B3AD-7806-49F0-BC15-CE6097D629...	08/12/2001	Donna	Carreras	Table
		null {4AD60909-9C6D-4A8B-A333-A35AD0EFC9...	08/03/2002	Donna	Carreras	Table
		null {C7B82642-1411-4EF1-93CA-D2A988BDF9...	08/06/2002	Donna	Carreras	Table
		null {FF062776-9112-49EE-941C-BB2072A41E12}	08/09/2002	Donna	Carreras	Table

Pada PowerBI kita bisa melihat dan membuat relasi antar dua buah jenis database. Yaitu dengan membuat Relationship dari kedua buah data. Untuk membuat Relationship bisa dengan klik new pada manage relationship.

Manage relationships

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	Finance Data (Segment)	to clean (Segment)
<input checked="" type="checkbox"/>	France (Segment)	to clean (Segment)
<input checked="" type="checkbox"/>	France-Germany (Segment)	to clean (Segment)
<input checked="" type="checkbox"/>	Person_Address (StateProvinceID)	Person_StateProvince (StateProvinceID)
<input checked="" type="checkbox"/>	Sales_SalesOrderHeader (2) (AccountNumber)	Sales_Customer (AccountNumber)

New...

Autodetect...

Edit...

Delete

Close

## Create relationship

Select tables and columns that are related.

Sales\_SalesOrderHeader (2)

ShipDate	Status	OnlineOrderFlag	SalesOrderNumber	PurchaseOrderNumber	AccountNumber	Cu
14 February 2002	5	-1	SO45389	null	10-4030-011090	
27 February 2002	5	-1	SO45463	null	10-4030-011171	
07 March 2002	5	-1	SO45512	null	10-4030-011175	

Sales\_Customer

CustomerID	TerritoryID	AccountNumber	CustomerType	rowguid	Modif
11015	4	AW00011015	I	{F791BD74-E882-4631-B9FC-F9FEE621FD13}	13/10/2
11016	4	AW00011016	I	{023843CA-25FB-42BF-AC37-FAF6F4120DAC}	13/10/2
11023	4	AW00011023	I	{A2833BD8-44A8-4665-808E-33E19ECD7F54}	13/10/2

Cardinality

Cross filter direction

☐ Make this relationship active

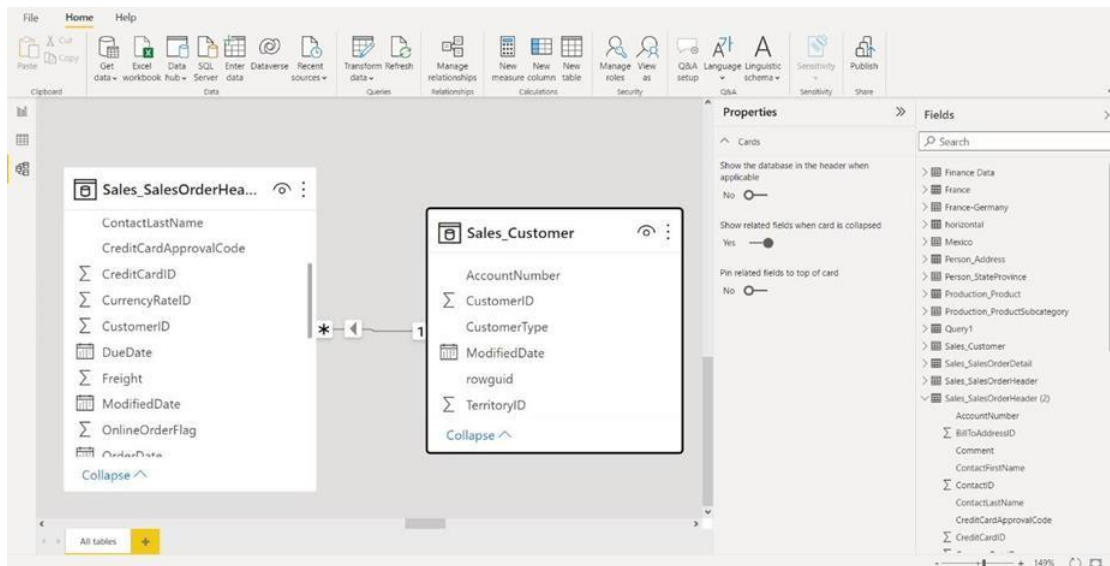
☐ Apply security filter in both directions

☐ Assume referential integrity

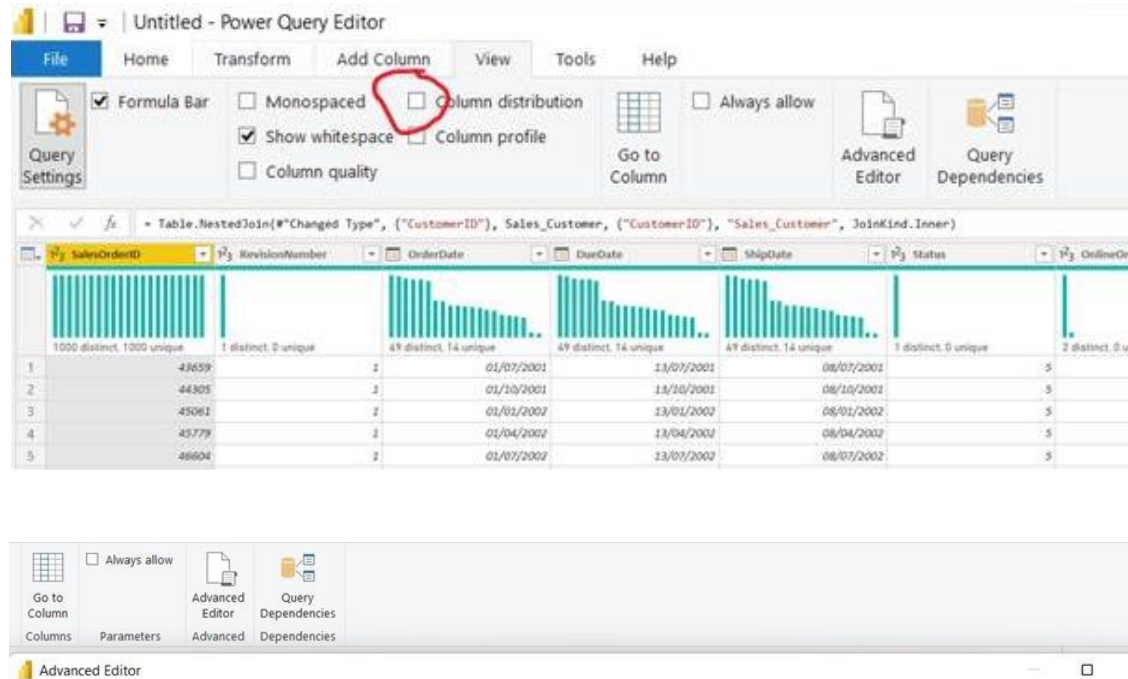
⚠ There's already a relationship between these two columns.

OK Cancel

Dalam membuat Relationship, kita harus memastikan kedua buah data memiliki keterkaitan antar satu dengan yang lain. Jika bisa dibuat Relations dari kedua data maka data akan ditampilkan sebagai berikut.



Pada PowerBI kita bisa melihat Column Distribution dan Mengubah Query dengan fungsi Advance Director pada PowerBI



## Sales\_SalesOrderHeader (2)

Display Options

```
let
    Source = Excel.Workbook(File.Contents("C:\Users\ARANYA\Downloads\Compressed\Support Files\Retail Database.xlsx"), null, true),
    Sales_SalesOrderHeader_Sheet = Source[[Item="Sales_SalesOrderHeader", Kind="Sheet"]][Data],
    #"Promoted Headers" = Table.PromoteHeaders(Sales_SalesOrderHeader_Sheet, [PromoteAllScalars=true]),
    #"Changed Type" = Table.TransformColumnTypes(#"Promoted Headers",{{"SalesOrderID", Int64.Type}, {"RevisionNumber", Int64.Type}, {"OrderDate", Date.Type}, {"DueDate", Date.Type}, {"ShipDate", Date.Type}, {"Status", Int32.Type}, {"OnlineOrder", Int32.Type}}),
    #"Merged Queries" = Table.NestedJoin(#"Changed Type", {"CustomerID"}, Sales_Customer, {"CustomerID"}, "Sales_Customer", JoinKind.Inner)
in
    #"Merged Queries"
```