

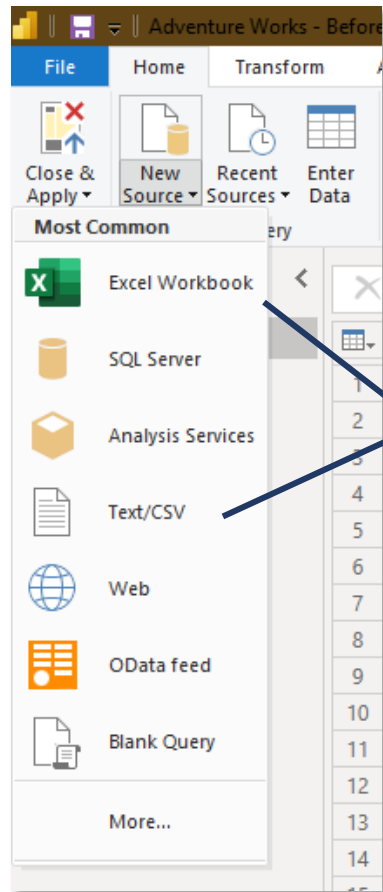
Beginner Guide to Power BI

Ahmad Hatahet, Nov 19th, 2022

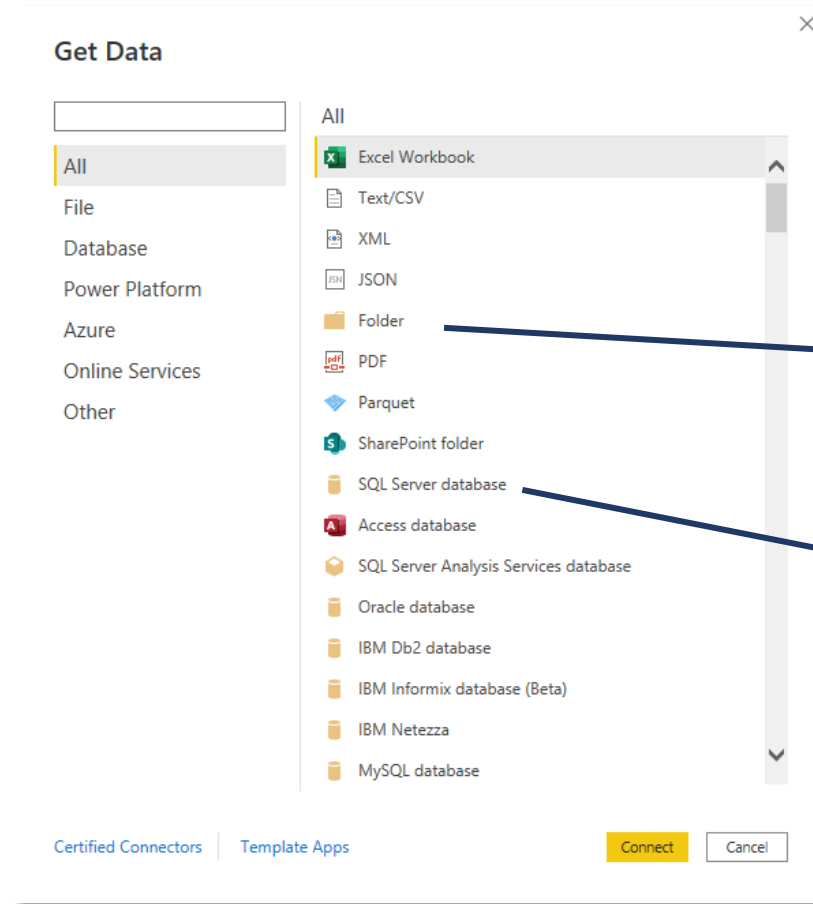
Import and Transform Data:

- Import CSV
- Simple Date transformation
- Region/Localization
- Replace Values
- How steps are listed and could be renamed
- Add Custom Column
- Merge Queries
- Append Queries
- Pivot/Unpivot Columns

Import CSV

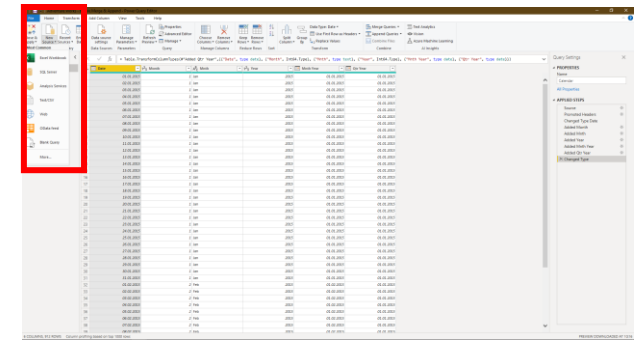


Excel and simple text files



All files in a folder

Connect to SSMS



Simple Date transformation

Text to Date

A ^B C Date	Date
1/1/2015	01.01.2015
1/2/2015	02.01.2015
1/3/2015	03.01.2015
1/4/2015	04.01.2015
1/5/2015	05.01.2015
1/6/2015	06.01.2015
1/7/2015	07.01.2015
1/8/2015	08.01.2015

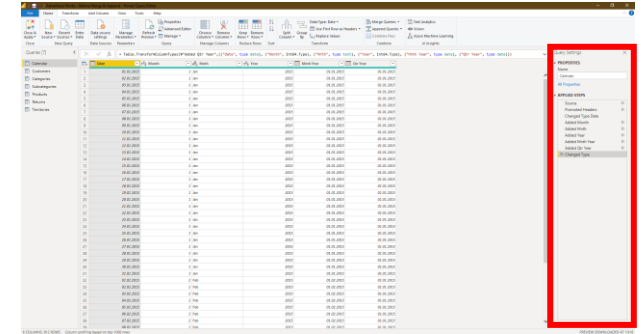
Text to Currency

A ^B _C AnnualIncome	\$ AnnualIncome
\$90,000	90.000,00
\$60,000	60.000,00
\$60,000	60.000,00
\$70,000	70.000,00
\$80,000	80.000,00
\$70,000	70.000,00
\$60,000	60.000,00
\$60,000	60.000,00

Merge Columns

A _C FirstName	A _C LastName	A _C FullName
JON	YANG	Jon Yang
EUGENE	HUANG	Eugene Huang
RUBEN	TORRES	Ruben Torres
CHRISTY	ZHU	Christy Zhu
ELIZABETH	JOHNSON	Elizabeth Johnson
JULIO	RUIZ	Julio Ruiz
MARCO	MEHTA	Marco Mehta
ROBIN	VERHOFF	Robin Verhoff

Query Steps



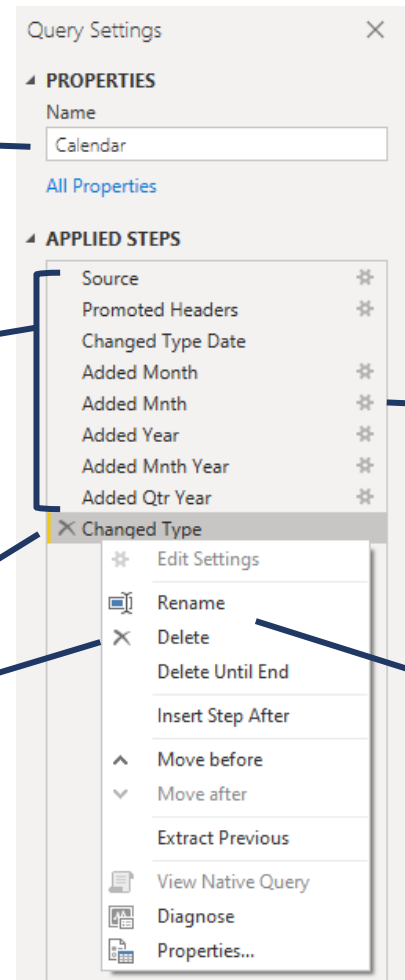
Query Name

Query Steps
Executed in
sequential
order

Delete a step

Edit custom
column function

Rename a
step



Merge Queries

Merge

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

Categories

ProductCategoryKey	CategoryName
1	Bikes
2	Components
3	Clothing
4	Accessories

Subcategories

ProductSubcategoryKey	SubcategoryName	ProductCategoryKey
1	Mountain Bikes	1
2	Road Bikes	1
3	Touring Bikes	1
4	Handlebars	2
5	Bottom Brackets	2

Join Kind

Right Outer (all from second, matching from first)

☐ Use fuzzy matching to perform the merge

► Fuzzy matching options

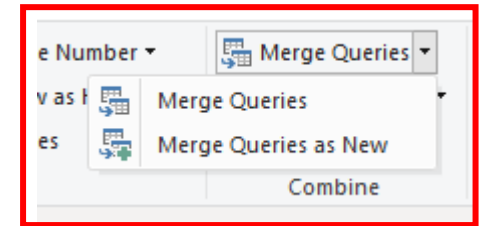
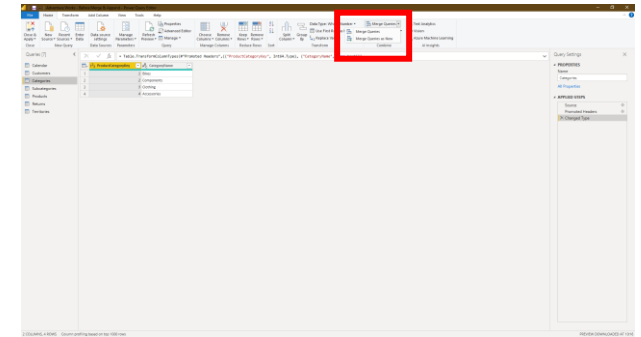
✓ The selection matches 37 of 37 rows from the second table.

OK Cancel

Left Table

Right Table

Join Type



Merge Queries

Repeated at each occurrence

1 ² ₃ ProductCategoryKey	A ^B _C CategoryName
1	1 Bikes
2	2 Components
3	3 Clothing
4	4 Accessories

1 ² ₃ ProductSubcategoryKey	A ^B _C SubcategoryName	1 ² ₃ ProductCategoryKey
1	1 Mountain Bikes	1
2	2 Road Bikes	1
3	3 Touring Bikes	1
4	4 Handlebars	2
5	5 Bottom Brackets	2

1 ² ₃ ProductCategoryKey	A ^B _C CategoryName	Subcategories
1	1 Bikes	Table
2	2 Components	Table
3	3 Clothing	Table
4	4 Accessories	Table

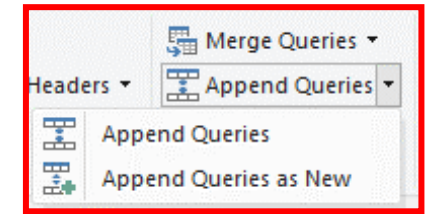
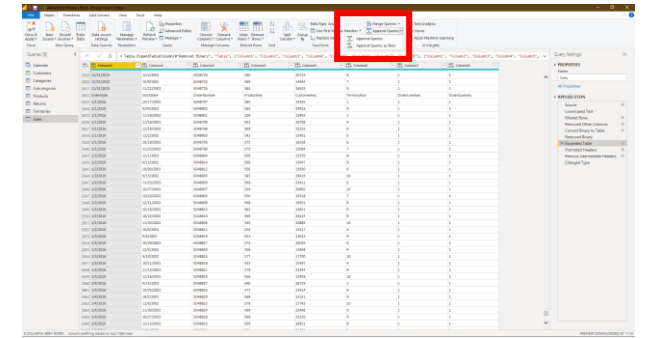
1 ² ₃ ProductCategoryKey	A ^B _C CategoryName	1 ² ₃ ProductSubcategoryKey	A ^B _C SubcategoryName
1	1 Bikes	1	1 Mountain Bikes
2	1 Bikes	2	2 Road Bikes
3	1 Bikes	3	3 Touring Bikes
4	2 Components	4	4 Handlebars
5	2 Components	5	5 Bottom Brackets
6	2 Components	6	6 Brakes
7	2 Components	7	7 Chains
8	2 Components	8	8 Cranksets
9	2 Components	9	9 Derailleurs
10	2 Components	10	10 Forks
11	2 Components	11	11 Headsets
12	2 Components	12	12 Mountain Frames
13	2 Components	13	13 Pedals
14	2 Components	14	14 Road Frames
15	2 Components	15	15 Saddles

Append Queries

OrderDate	StockDate	OrderNumber	ProductKey	CustomerKey	TerritoryKey	OrderLineItem	OrderQuantity
1/1/2015	9/21/2001	SO45080	332	14657	1	1	1
1/1/2015	12/5/2001	SO45079	312	29255	4	1	1
1/1/2015	10/29/2001	SO45082	350	11455	9	1	1
1/1/2015	11/16/2001	SO45081	338	26782	6	1	1
1/2/2015	12/15/2001	SO45083	312	14947	10	1	1
1/2/2015	10/12/2001	SO45084	310	29143	4	1	1

OrderDate	StockDate	OrderNumber	ProductKey	CustomerKey	TerritoryKey	OrderLineItem	OrderQuantity
1/1/2016	10/17/2002	SO48797	385	14335	1	1	1
1/1/2016	9/30/2002	SO48802	383	24923	9	1	1
1/1/2016	11/29/2002	SO48801	326	15493	1	1	1
1/1/2016	11/16/2002	SO48799	352	26708	4	1	1
1/1/2016	12/16/2002	SO48798	369	23332	9	1	1
1/1/2016	12/2/2002	SO48800	340	15401	5	1	1

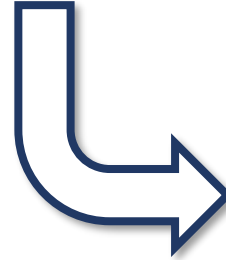
ABC 123	Column1	ABC 123	Column2	ABC 123	Column3	ABC 123	Column4	ABC 123	Column5	ABC 123	Column6	ABC 123	Column7	ABC 123	Column8
2629	12/31/2015		12/2/2002		SO48724		340		20722		8		1		1
2630	12/31/2015		10/9/2002		SO48723		369		14944		7		1		1
2631	12/31/2015		11/22/2002		SO48726		383		24915		9		1		1
2632	OrderDate		StockDate		OrderNumber		ProductKey		CustomerKey		TerritoryKey		OrderLineItem		OrderQuantity
2633	1/1/2016		10/17/2002		SO48797		385		14335		1		1		1
2634	1/1/2016		9/30/2002		SO48802		383		24923		9		1		1
2635	1/1/2016		11/29/2002		SO48801		326		15493		1		1		1
2636	1/1/2016		11/16/2002		SO48799		352		26708		4		1		1
2637	1/1/2016		12/16/2002		SO48798		369		23332		9		1		1



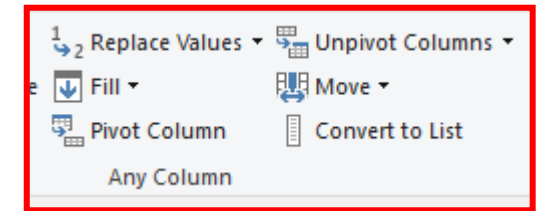
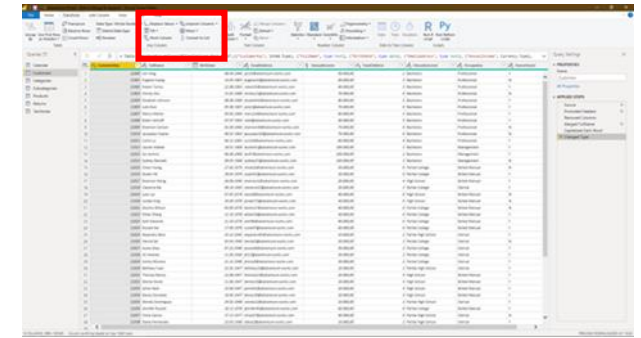
Import from folder, automatically
append all imported files

Pivot/Unpivot Columns

		2016				2017			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Germany	Berlin	38.834	67.699	33.491	72.129	78.767	52.877	61.949	35.949
	Munich	75.257	81.115	10.534	13.543	45.736	42.001	97.121	7.161
	Frankfurt	74.542	27.854	59.517	14.658	16.146	6.721	22.947	52.071
Total		188.633	176.668	103.542	100.330	140.649	101.599	182.017	95.181
USA	New York	60.507	20.643	63.837	48.155	75.146	93.114	96.170	67.254
	Boston	81.929	67.257	43.765	91.705	79.900	97.227	32.580	80.321
	California	17.746	74.581	59.157	52.914	23.812	64.993	27.208	21.624
Total		160.182	162.481	166.759	192.774	178.858	255.334	155.958	169.199
ME	UAE	58.109	92.166	60.578	89.321	31.152	60.291	75.889	8.528
	Jordan	5.930	27.403	88.201	41.956	95.842	32.625	48.737	46.767
	Egypt	43.632	88.897	61.235	66.927	70.983	99.722	19.291	54.107
Total		107.671	208.466	210.014	198.204	197.977	192.638	143.917	109.402

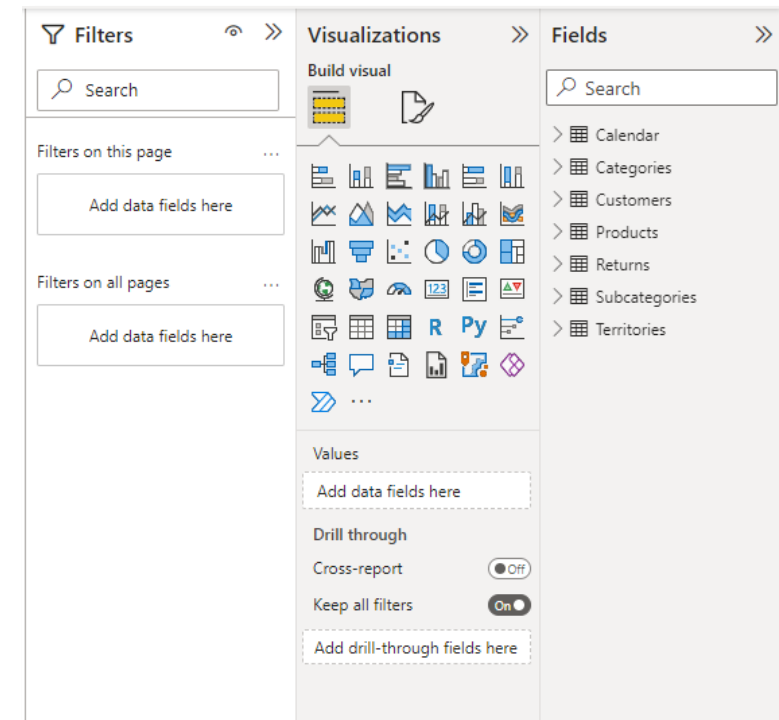
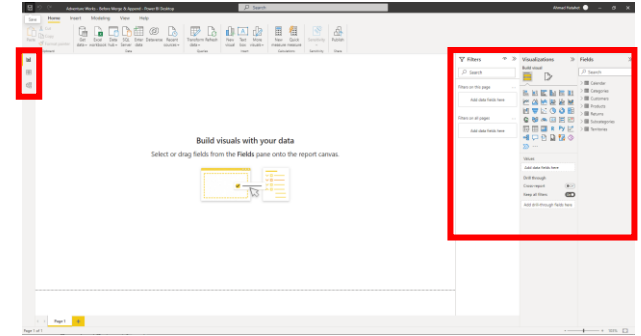


Year	Qtr	Country	City	Revenue
2016	Qtr 1	Germany	Berlin	38.834
2016	Qtr 1	Germany	Munich	75.257
2016	Qtr 1	Germany	Frankfurt	74.542
2016	Qtr 1	USA	New York	60.507
2016	Qtr 1	USA	Boston	81.929
2016	Qtr 1	USA	California	17.746
2016	Qtr 1	ME	UAE	58.109
2016	Qtr 1	ME	Jordan	5.930
2016	Qtr 1	ME	Egypt	43.632
2016	Qtr 2	Germany	Berlin	67.699
2016	Qtr 2	Germany	Munich	81.115
2016	Qtr 2	Germany	Frankfurt	27.854
2016	Qtr 2	USA	New York	20.643



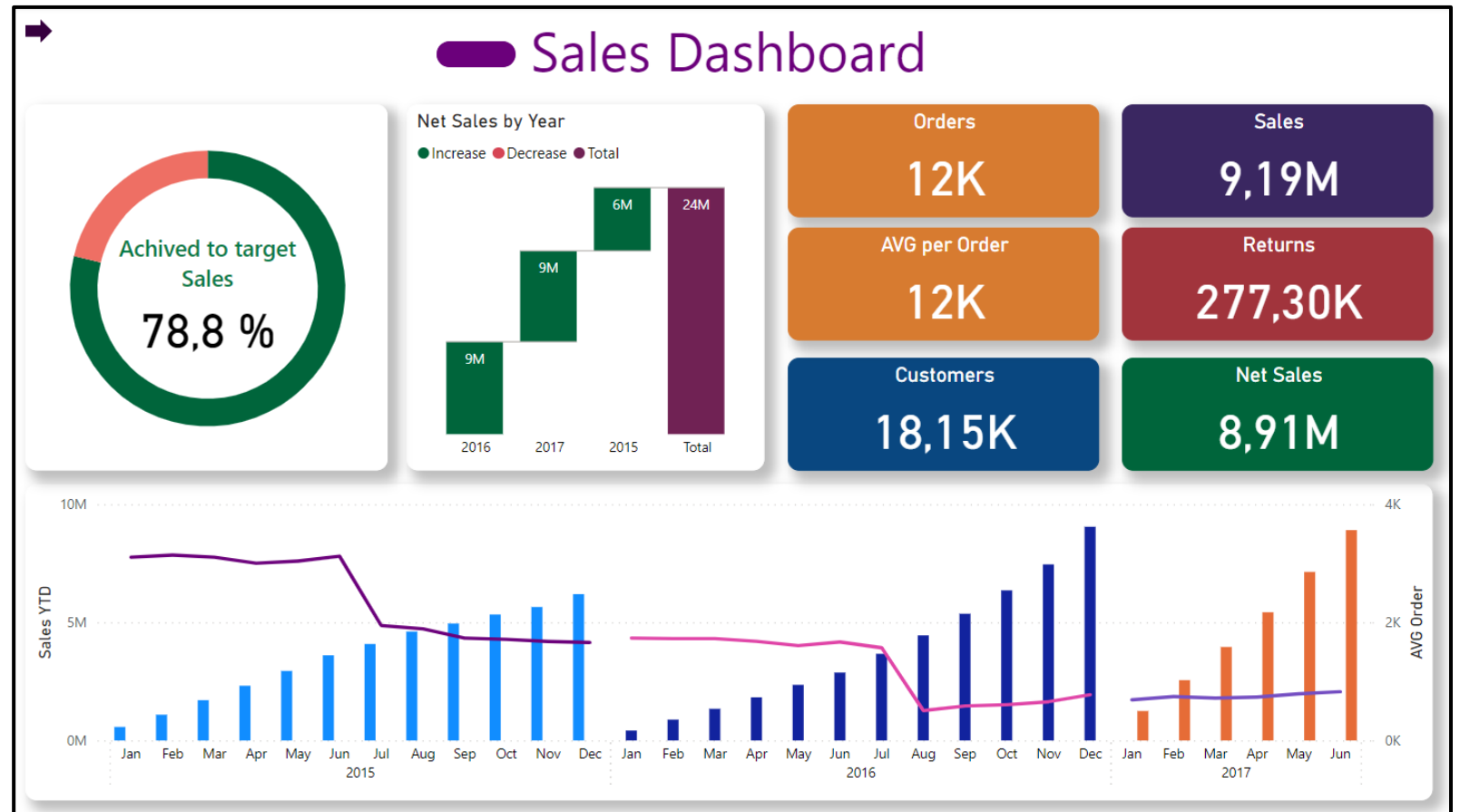
Power BI GUI:

- Report View
 - Fields
 - Visualizations
 - Filters
- Table View
- Relationship
 - One to Many
 - Direction of the relation



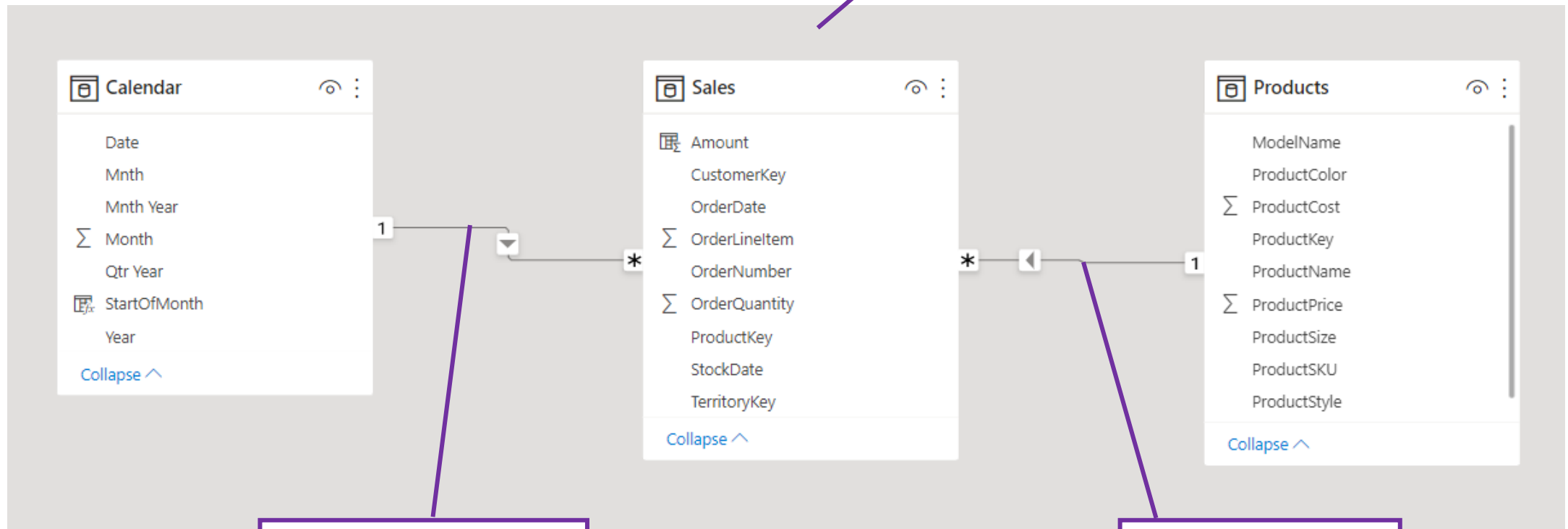
Starter Dashboard:

- Sort Month Names based on numbers
- Add Slicer
- Add Line
 - Data Labels
 - Legends
- Add Matrix
 - Order of fields
- Add KPI



Relationship

One fact table and
multiple dimension tables
“Star Schema”



Left table “Calendar”
can slice right table
“Sales”

Each Product has
multiple sales

Writing DAX

- Measure
 - Filter Context
 - Collect all measures in one place
 - Iterate (SUMX, AVGX)
 - Calculate – Override filter context
- Calculated Column vs Measure

CategoryName	Amount	% of Parent Category	% of All Category
Accessories	885.417,02	100,0 %	3,7 %
Bike Racks	35.280,00	4,0 %	0,1 %
Bike Stands	35.934,00	4,1 %	0,1 %
Bottles and Cages	105.698,82	11,9 %	0,4 %
Cleaners	13.363,95	1,5 %	0,1 %
Fenders	85.853,88	9,7 %	0,4 %
Helmets	199.414,62	22,5 %	0,8 %
Hydration Packs	36.843,30	4,2 %	0,2 %
Tires and Tubes	373.028,45	42,1 %	1,5 %
Bikes	22.908.941,80	100,0 %	94,9 %
Mountain Bikes	8.332.251,86	36,4 %	34,5 %
Road Bikes	10.928.204,36	47,7 %	45,3 %
Touring Bikes	3.648.485,58	15,9 %	15,1 %
Clothing	354.950,16	100,0 %	1,5 %
Caps	35.484,44	10,0 %	0,1 %
Gloves	61.107,32	17,2 %	0,3 %
Jerseys	153.851,85	43,3 %	0,6 %
Shorts	63.270,96	17,8 %	0,3 %
Socks	9.358,59	2,6 %	0,0 %
Vests	31.877,00	9,0 %	0,1 %
Total	24.149.308,98	100,0 %	100,0 %

Iterate (SUMX, AVGX)

1

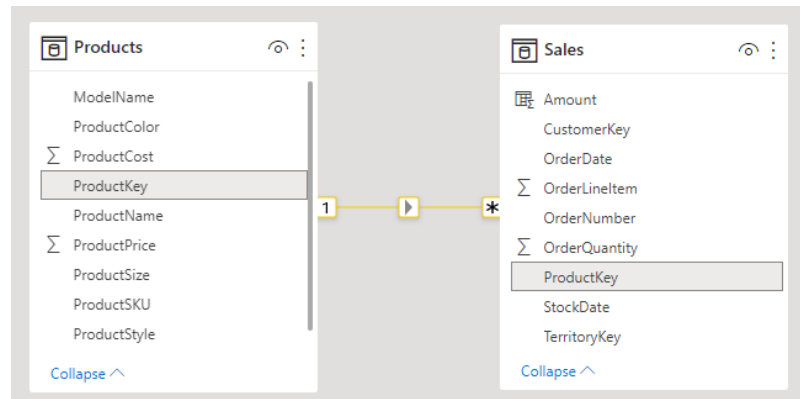
How to get total sales? $SUM(Quantity * Price)$

OrderDate	StockDate	OrderNumber	ProductKey	CustomerKey	TerritoryKey	OrderLineItem	OrderQuantity
Sonntag, 5. Juli 2015	Montag, 3. Juni 2002	SO46718	360	12570	9	1	1
Dienstag, 7. Juli 2015	Montag, 22. April 2002	SO46736	360	12341	9	1	1
Sonntag, 12. Juli 2015	Sonntag, 5. Mai 2002	SO46776	360	12356	9	1	1
Donnerstag, 16. Juli 2015	Samstag, 22. Juni 2002	SO46808	360	12347	9	1	1

2

We have quantity, but not the price?

Use "RELATED" to fetch the prices, by utilizing the relationship between "SALES" and "PRODUCT"



3

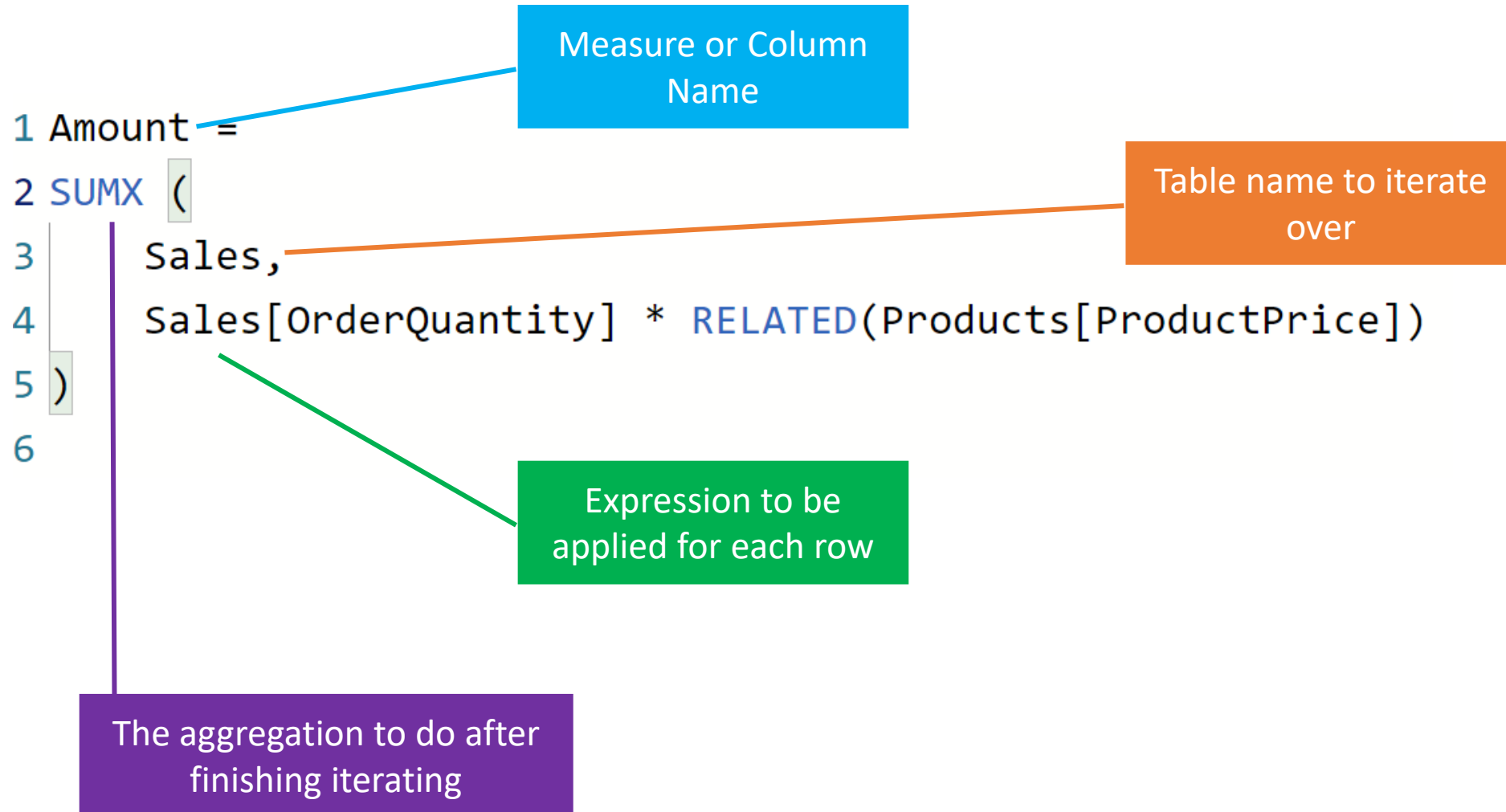
Add a measure to get the price and multiply with the quantity for each row in "SALES"

Amount =

```
SUMX (
    Sales,
    RELATED(Products[ProductPrice]) * Sales[OrderQuantity]
)
```

Sales
24,91M

Syntax - SUMX



Calculate – Override filter context

1 What is the Product importance within his category?

CategoryName	Amount	Amount Parent Category	% of Parent Category
Accessories	885.417,02	885.417,02	100,0 %
Bike Racks	35.280,00	885.417,02	4,0 %
Bike Stands	35.934,00	885.417,02	4,1 %
Bottles and Cages	105.698,82	885.417,02	11,9 %
Cleaners	13.363,95	885.417,02	1,5 %
Fenders	85.853,88	885.417,02	9,7 %
Helmets	199.414,62	885.417,02	22,5 %

2 Calculate the product sales

3 Total sales for each category

4 Divide the product sales by the

Syntax - CALCULATE

Calculate the product sales

[Amount]

Total sales for each category

1 Amount Parent Category =

2 CALCULATE(
3

[Amount],

Translation: calculate the [Amount] but ignore all filters regarding "SubcategoryName"

4 REMOVEFILTERS(Categories[SubcategoryName])

5)

Overwrite Filter

Divide the product sales by the ✓

1 % of Parent Category =

2 DIVIDE(
3

[Amount],

4 [Amount Parent Category]

5)

Calculated Column vs Measure

Calculated Column:

- Saved with the model
- Calculated at refresh time
- Row Context

Measure:

- Only definition is saved
- Calculated when it is used

Map



[More detailed comparison](#)

What is Next:

- Advanced DAX
 - Summarize, RANKX, SWITCH, Conditional Formatting
- Drill through
- Bookmarks
 - Navigation menu
- DAX Studio
 - Analyze generated DAX queries (Formula Engine vs Storage Engine)
- Tabular Editor
 - Calculation Groups

Important References



goodly



[Link to Dataset "Adventure Works" on Kaggle](#)



Thank you for your patience