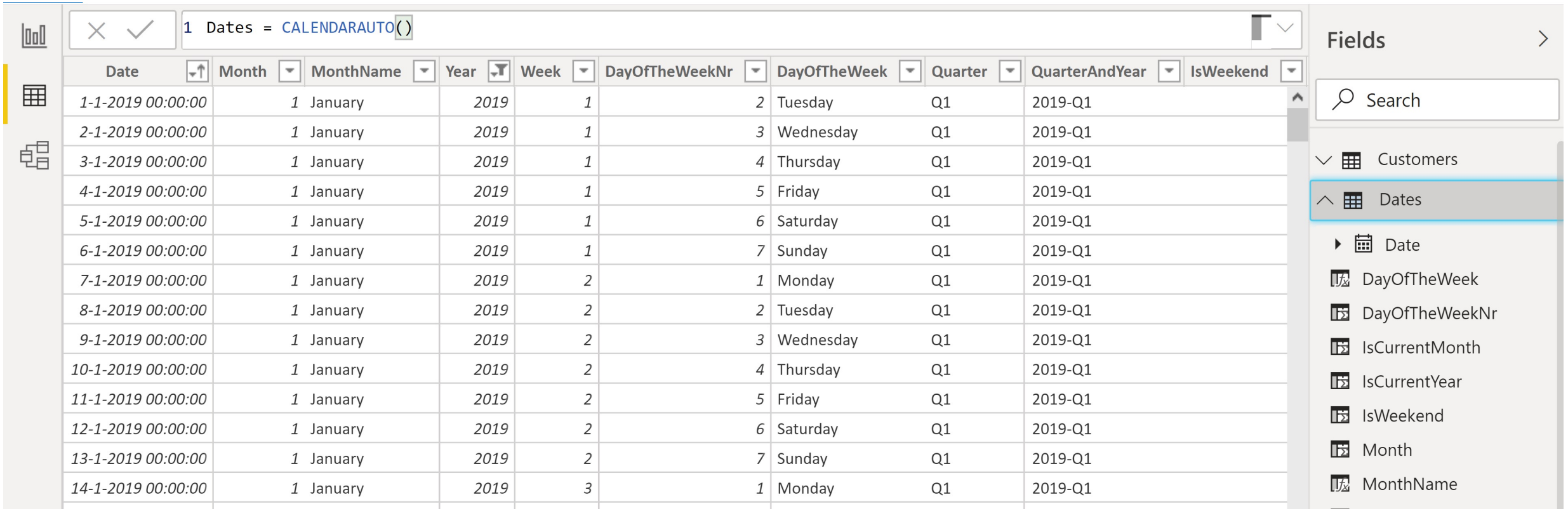
Date Table



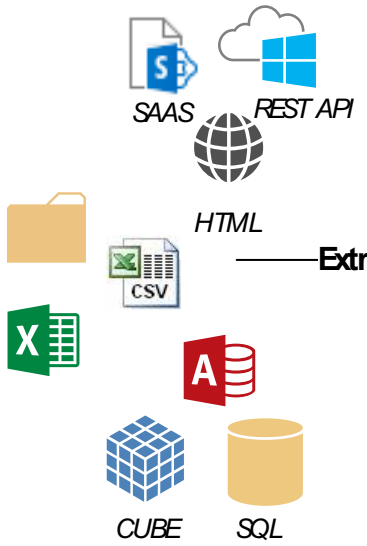
Date	Month	MonthName	Year	Week	DayOfTheWeekNr	DayOfTheWeek	Quarter	QuarterAndYear	IsWeekend
1-1-2019 00:00:00	1	January	2019	1	2	Tuesday	Q1	2019-Q1	
2-1-2019 00:00:00	1	January	2019	1	3	Wednesday	Q1	2019-Q1	
3-1-2019 00:00:00	1	January	2019	1	4	Thursday	Q1	2019-Q1	
4-1-2019 00:00:00	1	January	2019	1	5	Friday	Q1	2019-Q1	
5-1-2019 00:00:00	1	January	2019	1	6	Saturday	Q1	2019-Q1	
6-1-2019 00:00:00	1	January	2019	1	7	Sunday	Q1	2019-Q1	
7-1-2019 00:00:00	1	January	2019	2	1	Monday	Q1	2019-Q1	
8-1-2019 00:00:00	1	January	2019	2	2	Tuesday	Q1	2019-Q1	
9-1-2019 00:00:00	1	January	2019	2	3	Wednesday	Q1	2019-Q1	
10-1-2019 00:00:00	1	January	2019	2	4	Thursday	Q1	2019-Q1	
11-1-2019 00:00:00	1	January	2019	2	5	Friday	Q1	2019-Q1	
12-1-2019 00:00:00	1	January	2019	2	6	Saturday	Q1	2019-Q1	
13-1-2019 00:00:00	1	January	2019	2	7	Sunday	Q1	2019-Q1	
14-1-2019 00:00:00	1	January	2019	3	1	Monday	Q1	2019-Q1	

Options for creating a Date Table:

1. Use DAX functions to manually create a Date table and add calculated columns: **CalendarAuto**, Month, Format
2. Apply a ready-to-use **DAX-script** (see **txt**-file) C:\TrainingPowerBI\Exercises\Solution — Exercise 06A - DAX - Date Table script.txt
3. **Import** a date table from SQL Sever or Excel: C:\TrainingPowerBI\Exercises\Data — DatesTable.xlsx

For more information about creating a DAX Date table, click here.

DAX (Data Analysis eXpressions)



Extract

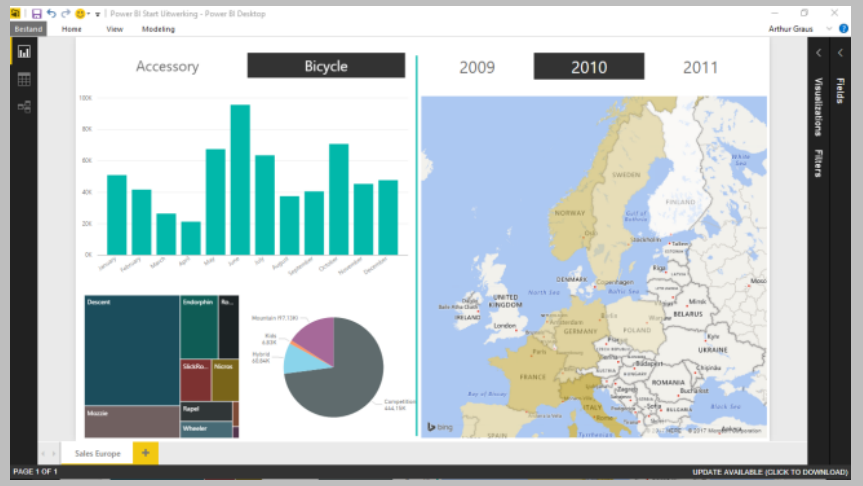
Query / ETL

Power Query Formula Language: "M"

Load

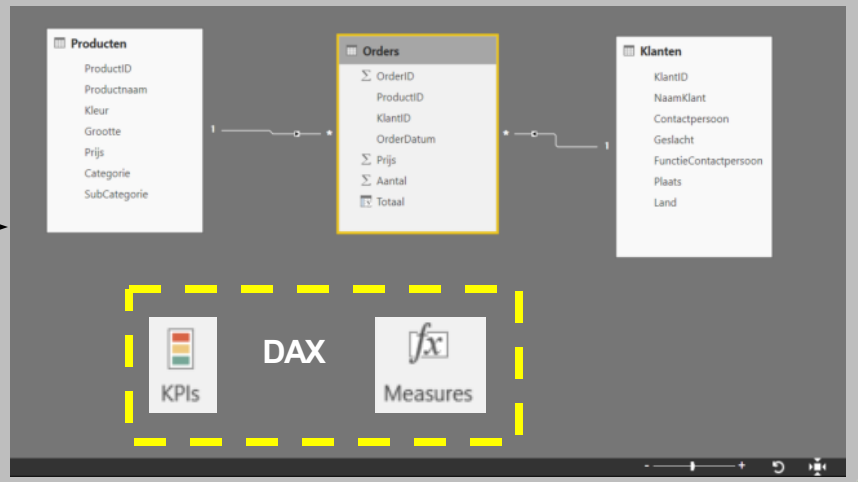
Power BI Desktop

Report



HTML 5 + JavaScript / PowerView

Dataset / Tabular Model



X-Velocity Engine / PowerPivot

Publish

ETL = Extract Transform Load

DAX - Calculated Columns

Simple calculations:

```
LineTotal = [Quantity]*[Price]
Name = [FirstName] & " " & [LastName]
```

Dates:

```
Yesterday = Now() - 1
Year = Year([OrderDate])
MonthNr = Month([OrderDate])
StartOfMonth = Date([Year], [MonthNr] , 1)
MonthName = Format([OrderDate],"MMM")
```

Logical expressions:

```
Salutation = If( [Gender] = "M" ,
                 "Mr.", "Mrs." )

Adult =      If( [Age] >= 18 && [Age] <= 67 ,
                 1 ,  0 )

Benelux =    If( [Country] = "NL" || [Country] = "BE" ||
                 [Country] = "LU" , 1 , 0 )
```

```
1 LineTotal = [Price] *[Quantity]
```

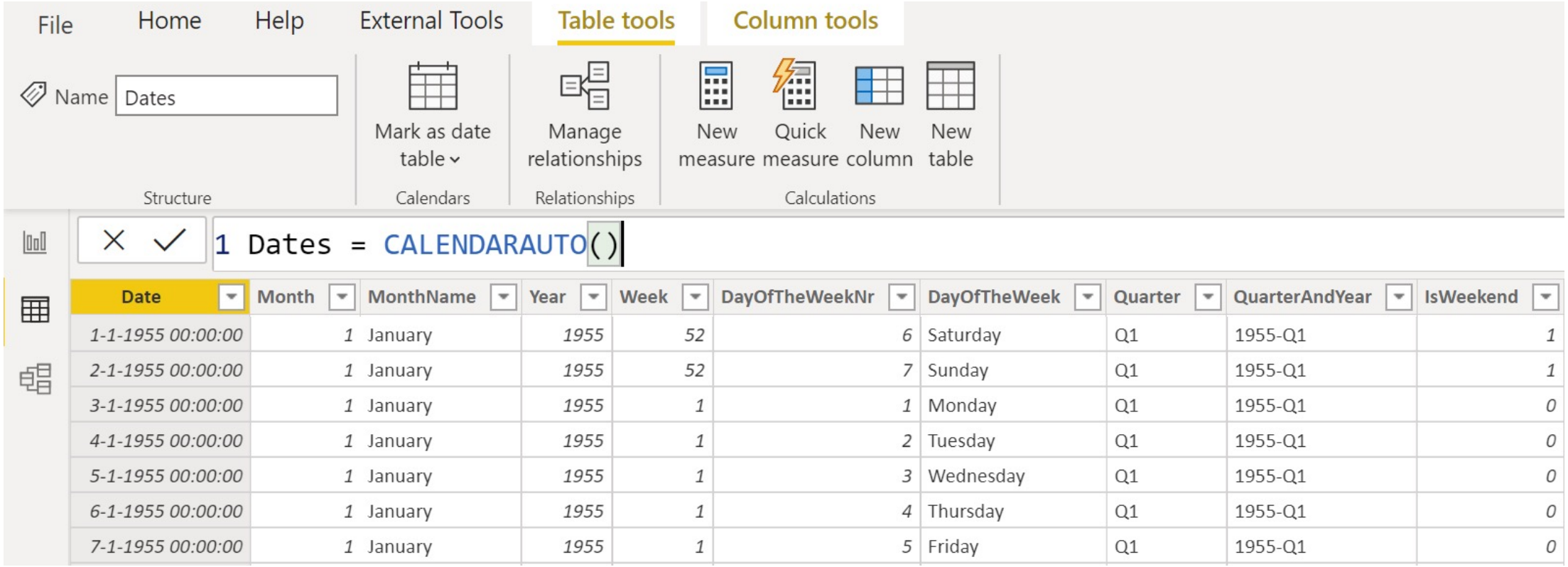
	OrderID	ProductID	CustomerID	OrderDate	Price	Quantity	LineTotal
Row Context	1137	2212	69	05-01-10	€ 53,9	3	€ 161,7
	1182	2214	67	15-01-10	€ 53,9	3	€ 161,7
	1184	2207	33	15-01-10	€ 53,9	3	€ 161,7
	1184	2214	33	15-01-10	€ 53,9	3	€ 161,7
	1195	2211	73	17-01-10	€ 53,9	3	€ 161,7
	1206	2208	13	19-01-10	€ 53,9	3	€ 161,7
	1222	2207	47	23-01-10	€ 53,9	3	€ 161,7
	1262	2211	44	04-02-10	€ 53,9	3	€ 161,7

Operator	Description
=	Equal
> , <	Greater than, less than
>= , <=	Greater or equal, less or equal
<>	Not equal
||	Or
&&	And

For an overview of all DAX Functions, click here.

Excercise 06A – DAX – Date Table

- Create a Date table using DAX by clicking on "Table tools" - "New table" and entering:
  Dates = CalendarAuto()

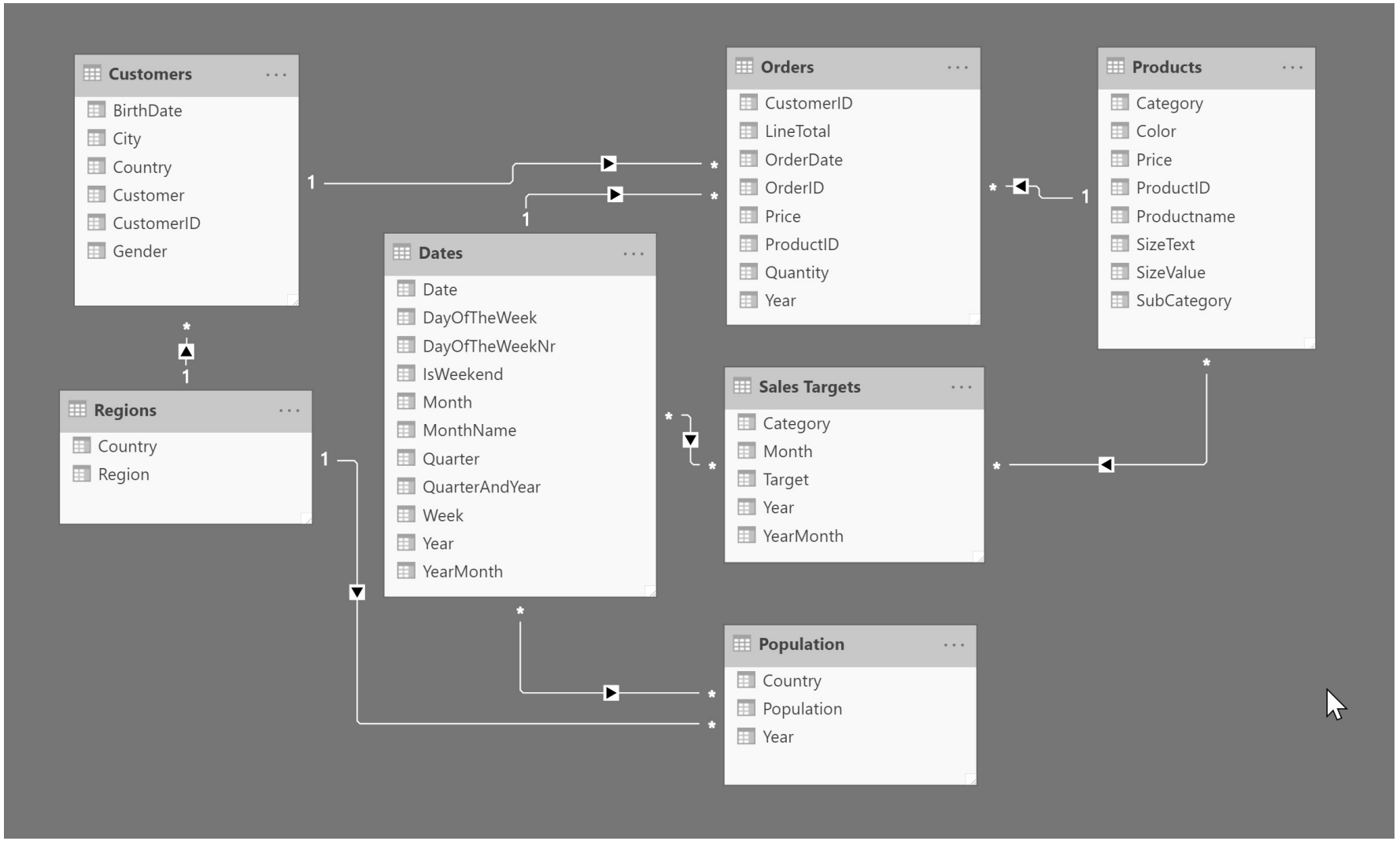


Date	Month	MonthName	Year	Week	DayOfTheWeekNr	DayOfTheWeek	Quarter	QuarterAndYear	IsWeekend
1-1-1955 00:00:00	1	January	1955	52	6	Saturday	Q1	1955-Q1	1
2-1-1955 00:00:00	1	January	1955	52	7	Sunday	Q1	1955-Q1	1
3-1-1955 00:00:00	1	January	1955	1	1	Monday	Q1	1955-Q1	0
4-1-1955 00:00:00	1	January	1955	1	2	Tuesday	Q1	1955-Q1	0
5-1-1955 00:00:00	1	January	1955	1	3	Wednesday	Q1	1955-Q1	0
6-1-1955 00:00:00	1	January	1955	1	4	Thursday	Q1	1955-Q1	0
7-1-1955 00:00:00	1	January	1955	1	5	Friday	Q1	1955-Q1	0

- Add all the Calculated Columns as shown above
- Hints: Month = MONTH([Date]) , MonthName = FORMAT([Date] , "MMMM") , Year = YEAR([Date])

Exercise 06B: Modelling – Relate to fact tables

- Create relationships between the date table and the 3 fact tables.
- Hint: create an extra column YearMonth in the Dates and Sales Targets table.



Exercise 06C: Report – Relate to Date table fact table

- Fix the KPI Matrix and add an extra month level with +/- icons
- Repair the other reports where dates are involved

Category	Accessory		Bicycle	
Year	LineTotal	Target	LineTotal	Target
2018				
January	€ 7.064	€ 7.000	€ 204.202	€ 250.000
February	€ 3.425	€ 4.000	€ 236.942	€ 150.000
March	€ 2.976	€ 5.000	€ 177.992	€ 250.000
April	€ 7.561	€ 7.000	€ 194.625	€ 250.000
May	€ 6.400	€ 7.000	€ 211.249	€ 200.000
June	€ 10.469	€ 9.000	€ 435.729	€ 250.000
July	€ 5.224	€ 5.000	€ 308.258	€ 250.000
August	€ 7.014	€ 7.000	€ 212.423	€ 250.000
September	€ 6.769	€ 7.000	€ 175.125	€ 250.000
October	€ 6.904	€ 7.000	€ 248.585	€ 250.000
November	€ 6.417	€ 7.000	€ 235.464	€ 250.000
December	€ 8.088	€ 7.000	€ 148.182	€ 200.000
2019				
January	€ 6.103	€ 7.500	€ 247.471	€ 230.000

Sort MonthName by MonthNr: https://docs.microsoft.com/en-us/power-bi/desktop-sort-by-column

DAX - Measures

Dates[Year] = 2018
Dates[Month] = "March"
Product[Categorie] = "Bicycle"
Regions[Country] = "United States"

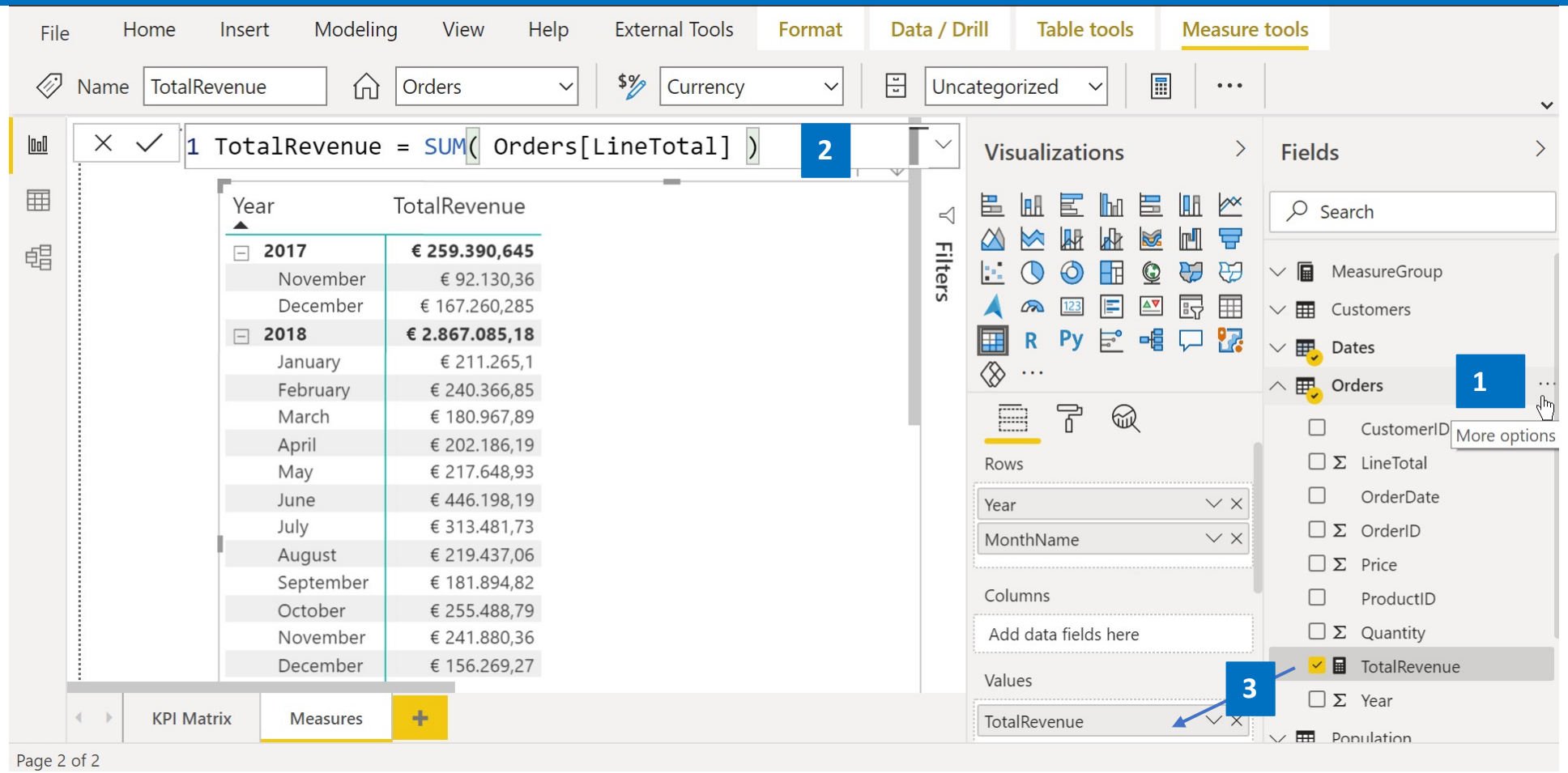
```
[€ Revenue]      = SUM(Orders[LineTotal])
[Avg Price]      = AVERAGE(Orders[Price])
[Min Quantity]   = MIN(Orders[Quantity])
[Max Quantity]   = MAX(Orders[Quantity])
[# Lines]        = COUNTROWS(Orders)
[# Countries]    = DISTINCTCOUNT(
                              Customer[Country])
[# with fax]     = COUNT(Customer[Fax])
```

Year: 2018 | Country: United States

Category / MonthName	Bicycle € Revenue	€ Target
January	€ 136.420	€ 250.000
February	€ 187.667	€ 150.000
March	Filter Context	€ 250.000
April	€ 160.337	€ 250.000
May	€ 120.563	€ 200.000
June	€ 216.266	€ 250.000
July	€ 207.777	€ 250.000
August	€ 151.038	€ 250.000
September	€ 132.913	€ 250.000
October	€ 162.361	€ 250.000
November	€ 179.470	€ 250.000
December	€ 94.218	€ 200.000
Total	**€ 1.885.800**	**€ 2.800.000**

For more information about Measures, click here.

Measure - Step by step



1. Click on … next to table name and choose: "New measure"
2. Enter name of Measure and DAX expression (SUM, AVERAGE, COUNT, etc.) in formula bar
3. Drag Measure on Values of the Matrix or Chart

Excercise 07 – DAX – Measures

- Create the following Measures and show them in a Matrix:

Total Revenue = SUM(Orders[LineTotal])

Year	Total Revenue	# of units sold	# of Orders	# of active customers	Avg Price	Target	KPI Revenue / Target
2017	**€ 259.391**	**597**	**181**	**84**	**€ 441,15**	**€ 210.000**	**124%**
November	€ 92.130	163	49	39	€ 529,30		Infinity
December	€ 167.260	434	132	74	€ 406,66	€ 210.000	80%
2018	**€ 2.867.085**	**5395**	**1563**	**257**	**€ 535,12**	**€ 2.879.000**	**100%**
January	€ 211.265	441	127	64	€ 499,31	€ 257.000	82%
February	€ 240.367	303	79	48	€ 788,90	€ 154.000	156%
March	€ 180.968	320	98	53	€ 565,89	€ 255.000	71%
April	€ 202.186	433	116	59	€ 467,97	€ 257.000	79%
May	€ 217.649	411	139	112	€ 536,02	€ 207.000	105%
June	€ 446.198	763	250	180	€ 584,02	€ 259.000	172%
July	€ 313.482	465	123	59	€ 650,61	€ 255.000	123%
August	€ 219.437	469	132	63	€ 484,76	€ 257.000	85%
September	€ 181.895	400	118	58	€ 466,16	€ 257.000	71%
October	€ 255.489	459	130	62	€ 547,89	€ 257.000	99%
November	€ 241.880	524	139	64	€ 455,89	€ 257.000	94%
December	€ 156.269	407	112	62	€ 422,15	€ 207.000	75%
2019	**€ 957.190**	**1620**	**448**	**76**	**€ 584,31**	**€ 2.845.200**	**34%**
Total	**€ 4.083.665**	**7612**	**2192**	**269**	**€ 538,17**	**€ 5.934.200**	**69%**