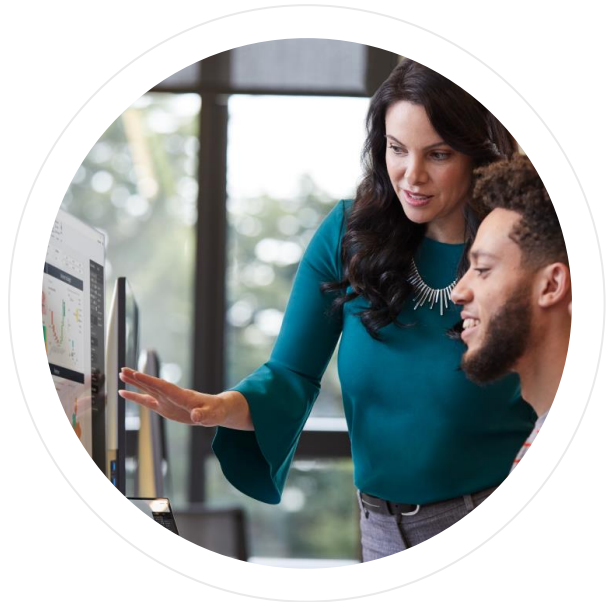


# Basic Power BI



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1

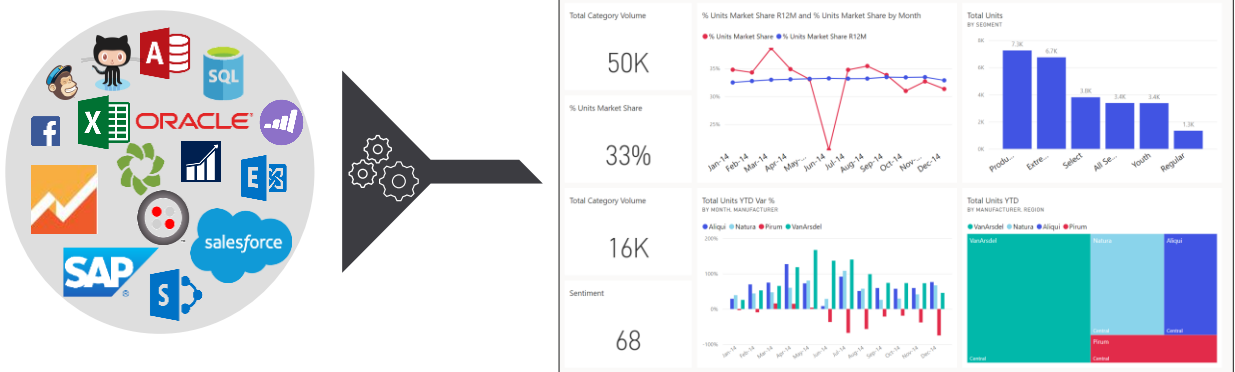
## Data analytics and Microsoft



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2

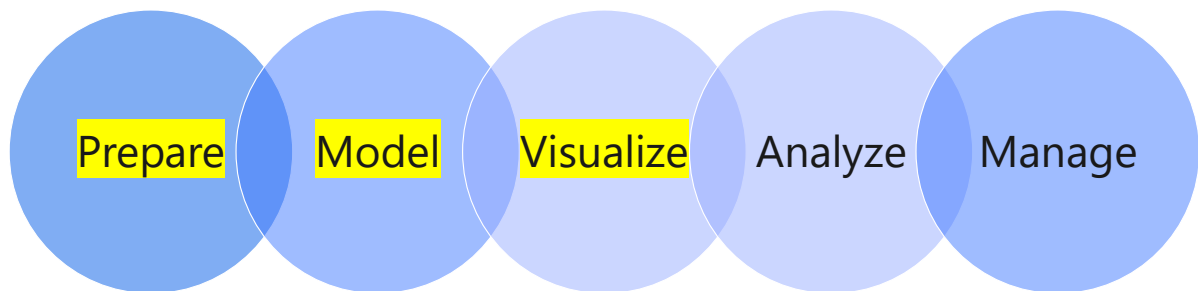
## From data to business insights with Power BI



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## Tasks of a Data Analyst



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# Getting started with Power BI



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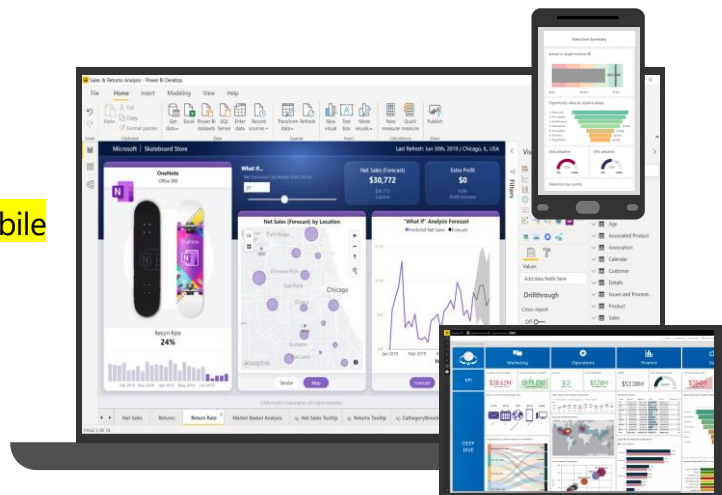
5

## Introduction to Power BI

Create with **Power BI Desktop**

Distribute with **Power BI service**

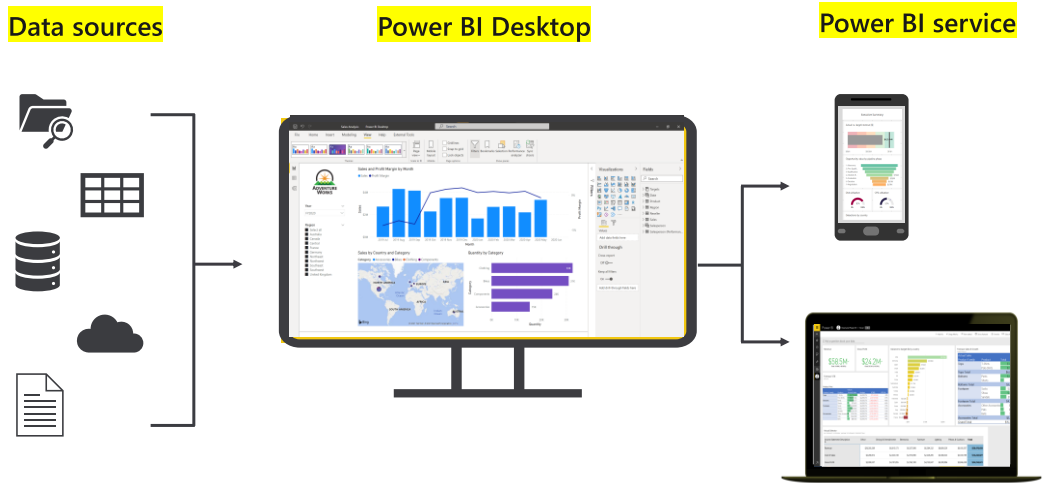
Access anywhere with **Power BI Mobile**



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## The flow of Power BI



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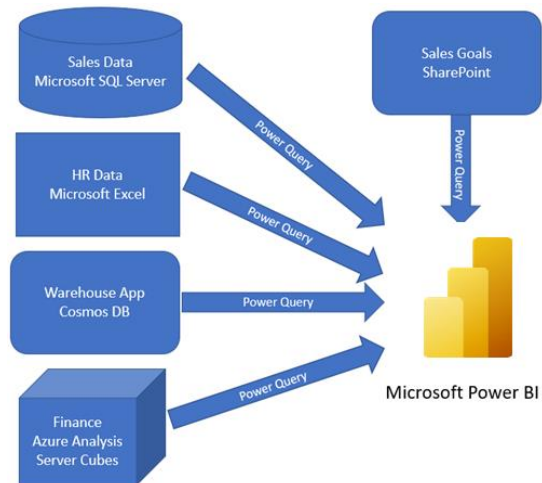
## Connect to data



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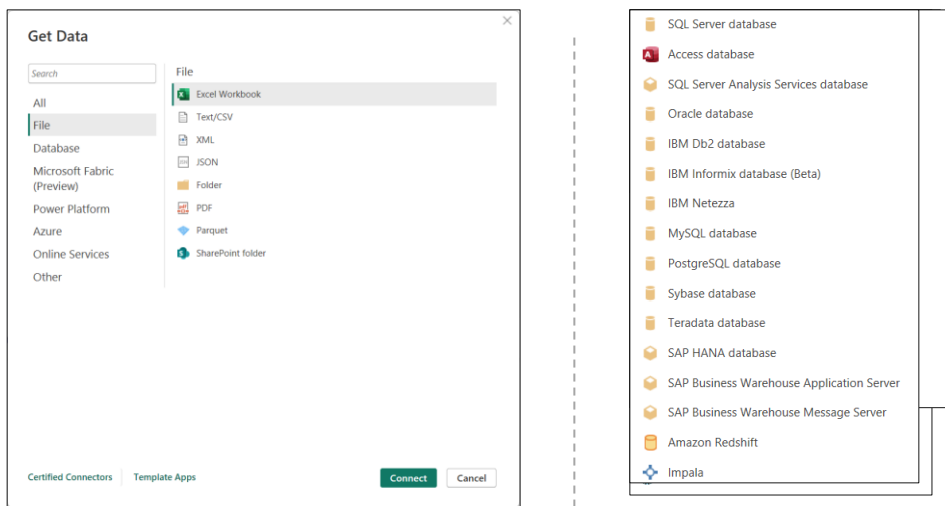
## Combine all data into a single dataset



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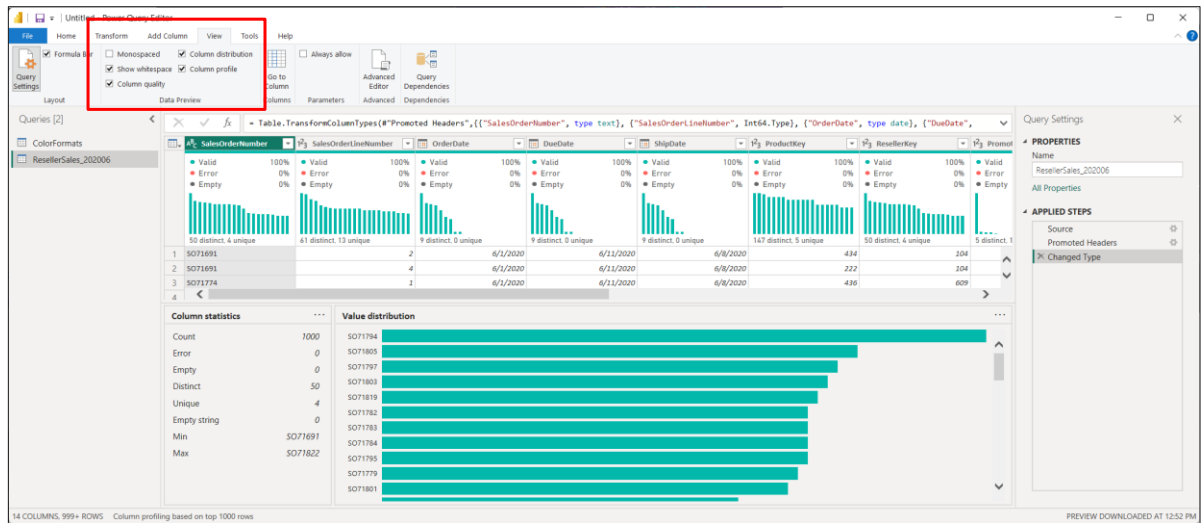
## Get data from a wide variety of sources



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## Data profiling options in Power Query Editor



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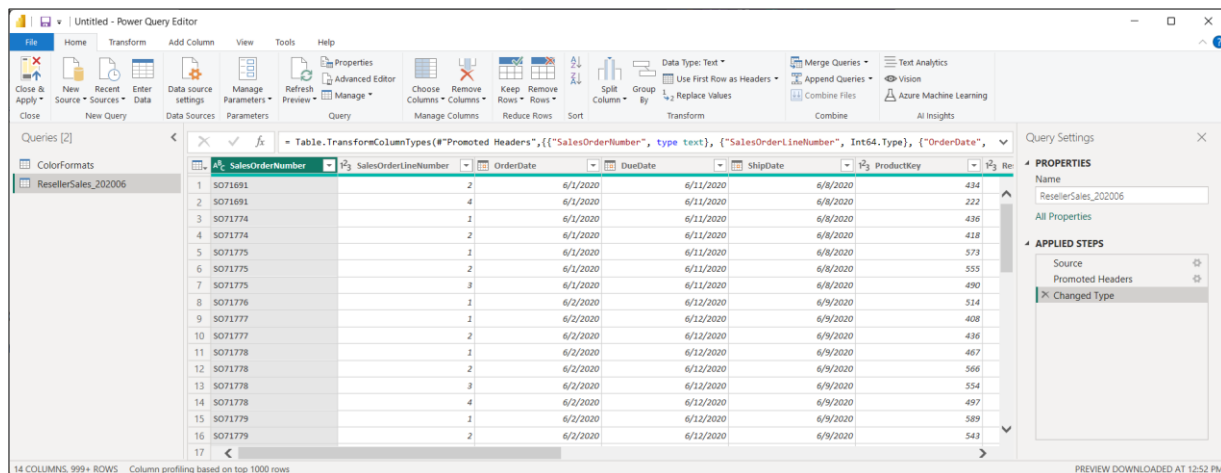
## Clean and transform the data



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# Transform data with Power Query Editor

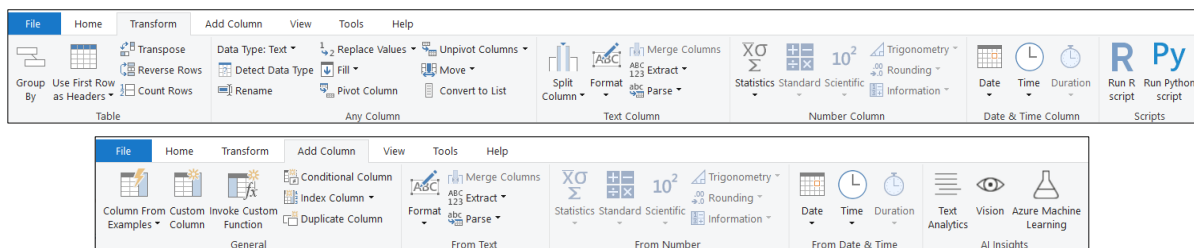


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## Common transformations

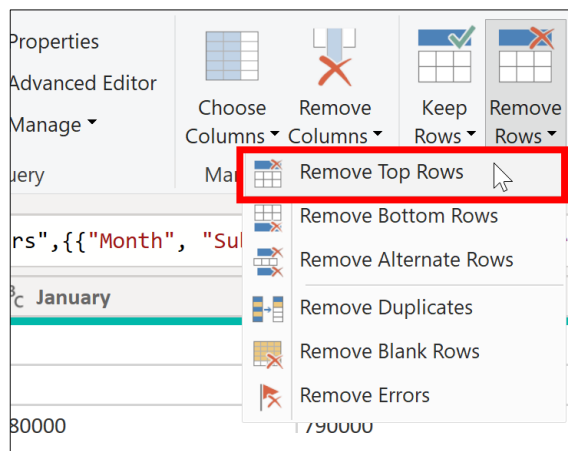
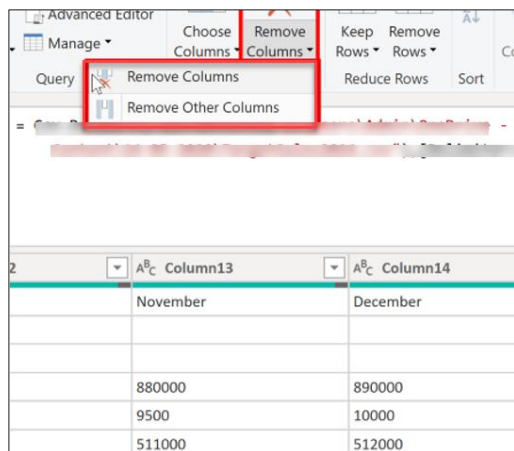
Transform columns, add new, split, extract, and more



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## Shaping table structure

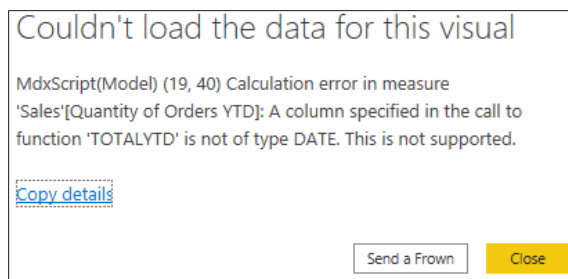


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## Evaluate and change column data types

ABC SalesOrderNumber	ABC OrderDate	ABC 123 TotalCost
SO43659	7/1/2017	2024.99
SO43659	7/1/2017	6074.97
SO43659	7/1/2017	2024.99
SO43659	7/1/2017	2039.99
SO43659	7/1/2017	2039.99
SO43659	7/1/2017	4079.98
SO43659	7/1/2017	2039.99
SO43659	7/1/2017	86.52
SO43659	7/1/2017	28.84
SO43659	7/1/2017	34.2



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## Combine multiple queries into one

**Append**

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

☐ Two tables ☒ Three or more tables

Available tables

- Production Suppliers
- Sales Customers
- HR Employees

Tables to append

- Production Suppliers
- Sales Customers
- HR Employees

Add >>

OK

**Merge**

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

Sales Orders

orderid	custid	empid	orderdate	requireddate	shippeddate	shipperid	freight	shipname
10248	85	5	7/4/2014	8/1/2014	7/16/2014	3	32.38	Ship to 85-B
10249	79	6	7/5/2014	8/16/2014	7/10/2014	1	11.61	Ship to 79-C
10250	34	4	7/8/2014	8/5/2014	7/12/2014	2	65.83	Destination SCC
10251	84	3	7/8/2014	8/5/2014	7/15/2014	1	41.34	Ship to 84-A

Sales OrderDetails

orderid	productid	unitprice	qty	discount
10248	11	14.00	12	0
10248	42	9.80	10	0
10248	72	34.80	5	0
10249	14	18.60	9	0
10249	51	42.40	40	0

Join Kind

Left Outer (all from first, matching from second)

☐ Use fuzzy matching to perform the merge

Fuzzy matching options

✓ The selection matches 830 of 830 rows from the first table.

OK Cancel

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 Microsoft Power Platform

## Design a data model in Power BI

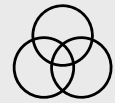
[aka.ms/PL300-3](https://aka.ms/PL300-3)



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# Data modeling introduction

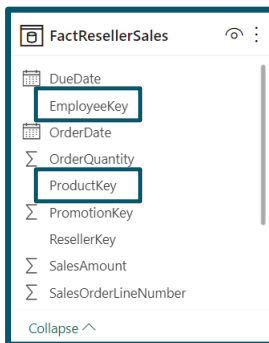


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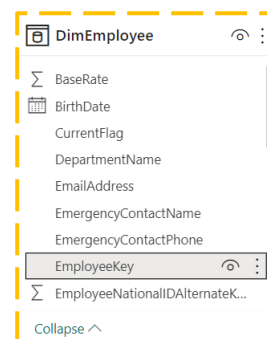
19

## Data table types

Fact tables are activities or events.



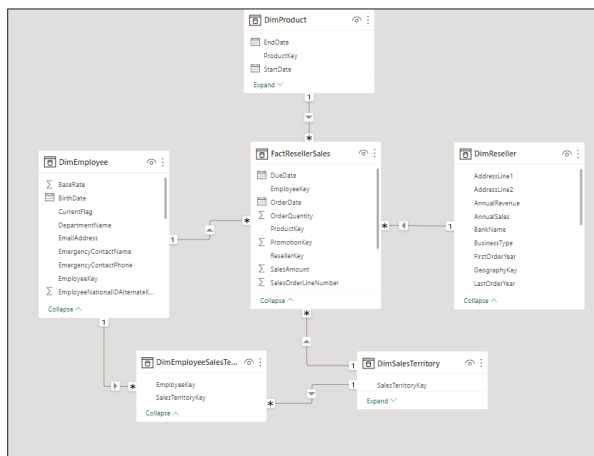
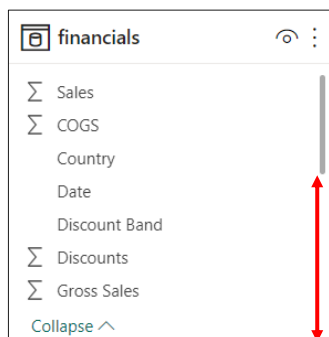
Dimension tables provide the details.



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## Understanding star schemas



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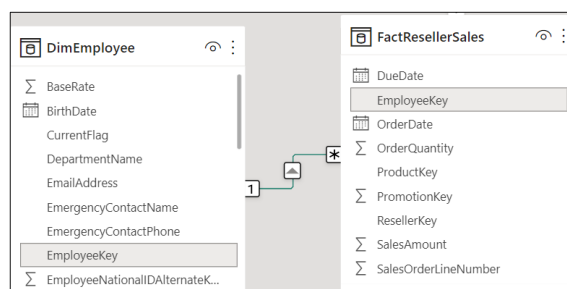
21

## Create relationships

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	DimEmployeeSalesTerritory (EmployeeKey)	DimEmployee (EmployeeKey)
<input checked="" type="checkbox"/>	DimEmployeeSalesTerritory (SalesTerritoryKey)	DimSalesTerritory (SalesTerritoryKey)
<input checked="" type="checkbox"/>	FactResellerSales (EmployeeKey)	DimEmployee (EmployeeKey)
<input checked="" type="checkbox"/>	FactResellerSales (ProductKey)	DimProduct (ProductKey)
<input checked="" type="checkbox"/>	FactResellerSales (ResellerKey)	DimReseller (ResellerKey)
<input checked="" type="checkbox"/>	FactResellerSales (SalesTerritoryKey)	DimSalesTerritory (SalesTerritoryKey)

Buttons: New... Autodetect... Edit... Delete

Close



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## Edit relationships

**Edit relationship**

Select tables and columns that are related.

FactResellerSales

DueDate	ShipDate	ProductKey	ResellerKey	PromotionKey	EmployeeKey	SalesTerritoryKey
Monday, September 4, 2017	Friday, September 1, 2017	235	312	1	282	
Monday, September 4, 2017	Friday, September 1, 2017	351	312	2	282	
Monday, September 4, 2017	Friday, September 1, 2017	348	312	1	282	

DimEmployee

EmployeeKey	ParentEmployeeKey	EmployeeNationalIDAlternateKey	ParentEmployeeNationalIDAlternateKey
12	188	912265825	33237992
17	189	132674823	33237992
24	201	835460180	332349500

Cardinality: Many to one (\*:1)

Cross filter direction: Single

☒ Make this relationship active

☐ Assume referential integrity

☐ Apply security filter in both directions

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## DAX calculations

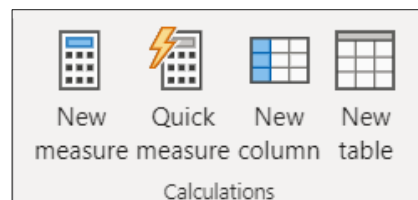


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## What is DAX?

- **D**ata **A**nalysis **E**xpressions
- Library of functions and operators
- Build formulas and expressions
- Create calculated measures, columns, and tables



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## Calculated measures

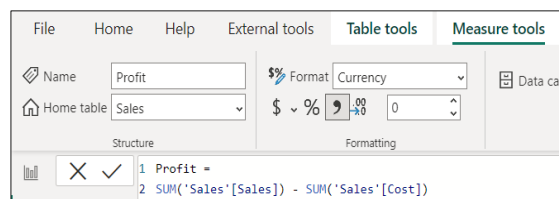
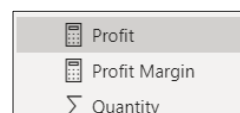
### Use DAX to create measures

Measures are **only** calculated when used.

Results are **not** stored in the data model.

**Responsive** to interactions, like filters.

Identified with **calculator** icon.



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## Calculated columns

The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. The formula bar displays the DAX formula for the calculated column:  $\text{Total Price} = \text{Sales}[\text{Quantity}] * \text{Sales}[\text{Unit Price}]$ . The table view shows data for the 'Sales' table, with the 'Total Price' column highlighted in red. A red box in the field list on the left also highlights the 'Total Price' calculated column.

Key	ResellerKey	EmployeeKey	SalesTerritoryKey	Quantity	Unit Price	Sales	Cost	Total Price
235	312	282	4	2	\$28.84	\$58	\$63	\$57.68
351	312	282	4	2	\$2,024.99	\$4,050	\$3,796	\$4,049.98
348	312	282	4	2	\$2,024.99	\$4,050	\$3,796	\$4,049.98
232	312	282	4	2	\$28.84	\$58	\$63	\$57.68
292	312	282	4	2	\$818.70	\$1,637	\$1,414	\$1,637.4
220	312	282	4	2	\$20.19	\$40	\$24	\$40.38
351	312	282	4	2	\$2,024.99	\$4,050	\$3,796	\$4,049.98

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## Calculated tables

The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. The formula bar displays the DAX formula for the calculated table:  $\text{Date} = \text{CALENDAR}(\text{AUTO}(6))$ . The table view shows data for the 'Date' table, with the 'Date' column highlighted in red. A red box in the field list on the right also highlights the 'Date' calculated table.

Date	Year	Quarter	Month	MonthKey
7/1/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/2/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/3/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/4/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/5/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/6/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/7/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/8/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/9/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707
7/10/2017 12:00:00 AM	FY2018	FY2018 Q1	2017 Jul	201707

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## Columns vs. measures

### Calculated columns:

- Create a value for each row in a table.
- Store values in the Power BI .pbix file.

### Measures:

- Calculate on demand.
- Calculated based on filters.

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