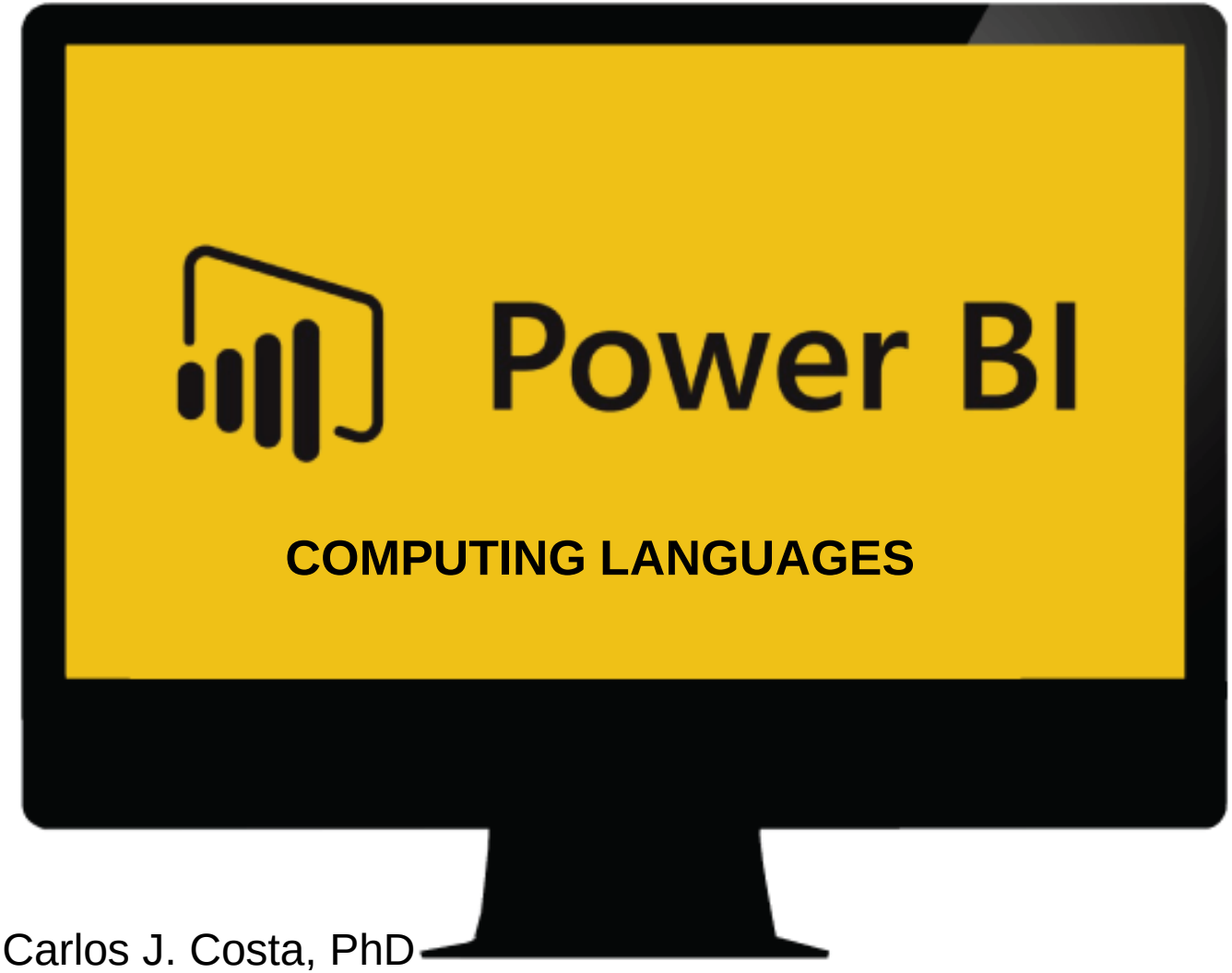


Prof. Carlos J. Costa, PhD
Associate Professor of Information Systems and Operation Management

Carlos J. Costa (2022)

Power BI

M

Power Query M Formula Language.

Language used in the context of PowerQuery

It's a functional, case sensitive language like F#.

Carlos J. Costa (2022)

Power BI

DAX

Data **A**nalysis E**x**pressions

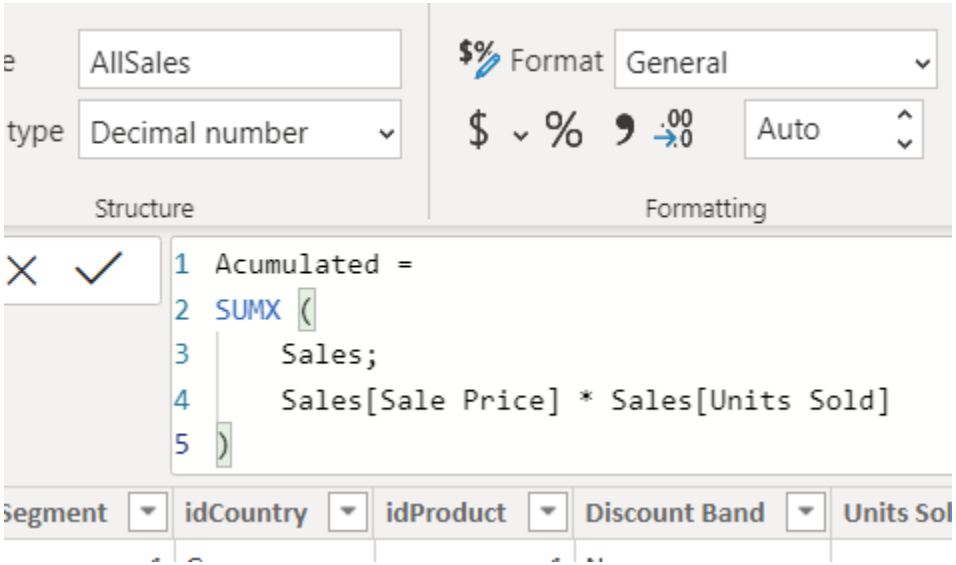
DAX is primarily a formula or a query language.

DAX was developed in 2009 by Microsoft

Power BI

DAX

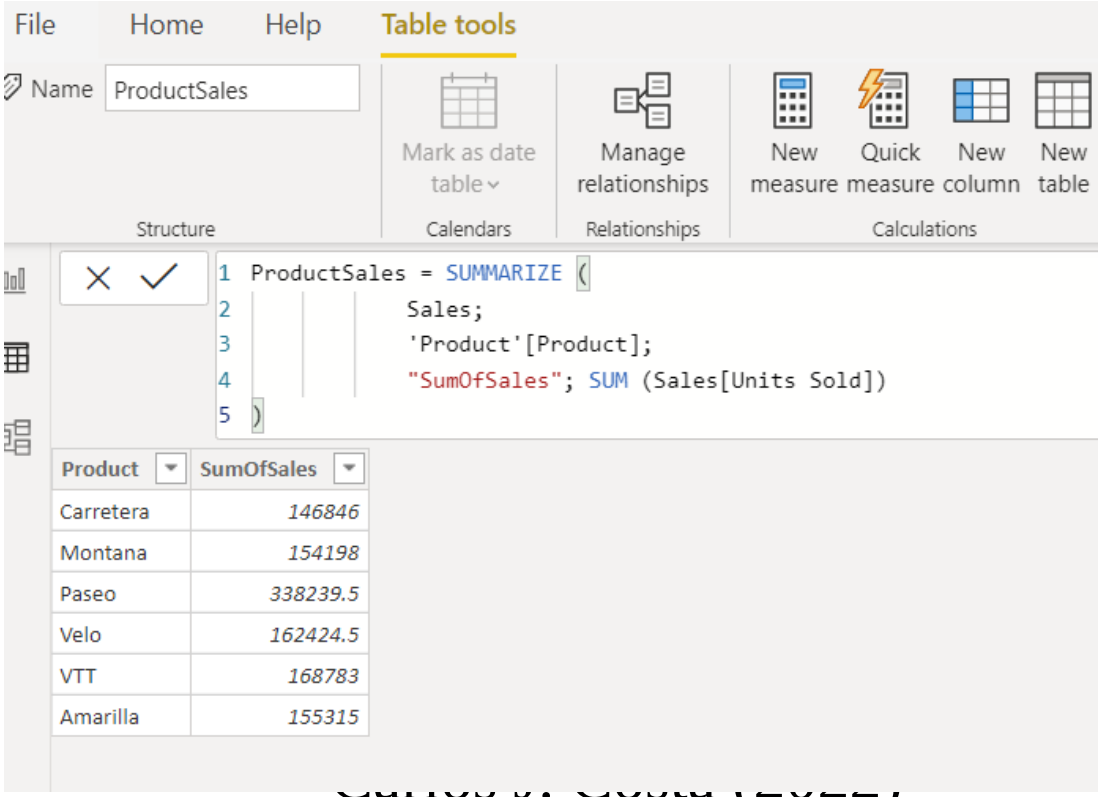
- Creating Columns



Power BI

DAX

- Creating Table



Power BI

DAX

- Arithmetic Operations and Conditions:

```
Sales[SalesAmount] = Sales[ProductPrice] *
Sales[ProductQuantity]

comment = if(Sales[Profit]>0;"Profit";"Loss")

Margin = if(ISERROR(Sales[profit]/Sales[value]);
                BLANK();
                Sales[profit]/Sales[value]
               )
country= SWITCH ( Sales[idCountry],
               "Fr", "France",
               "Ca", "Canada",
               "Me", "Mexico",
               "Un", "USA",
               "Other"
               )
```

Power BI

DAX

- LOOKUPVALUE

```
DiscountValue =
LOOKUPVALUE(Discount[Discount];
      Discount[Discount Band];
      Sales[Discount Band])

TotalCosts = LOOKUPVALUE(
      'Product'[Manufacturing cost];
      'Product'[idProduct];
      Sales[idProduct]
      )*Sales[Units Sold]
```

Power BI

DAX

- Summarizing

```
AllSales = sum(Sales[TotalSales_no_Discount])
```

- SUMX allows to iterate line by line

```
AllSales =
SUMX (
      Sales;
      Sales[Sale Price] * Sales[Units Sold]
)
```

Power BI

DAX

- iterate sales but with conditions

```
AllSales =
SUMX (
    FILTER(
        Sales;
        Sales[idCountry]="fr"
     );
     Sales[Sale Price] * Sales[Units
Sold]
)
```

Power BI

DAX

- SQL:

```
Select Product.Product, Sum([Units Sold])
From Sales, Product
Where Product.idProduct=Sales.idProduct
Group by Product.Product
```

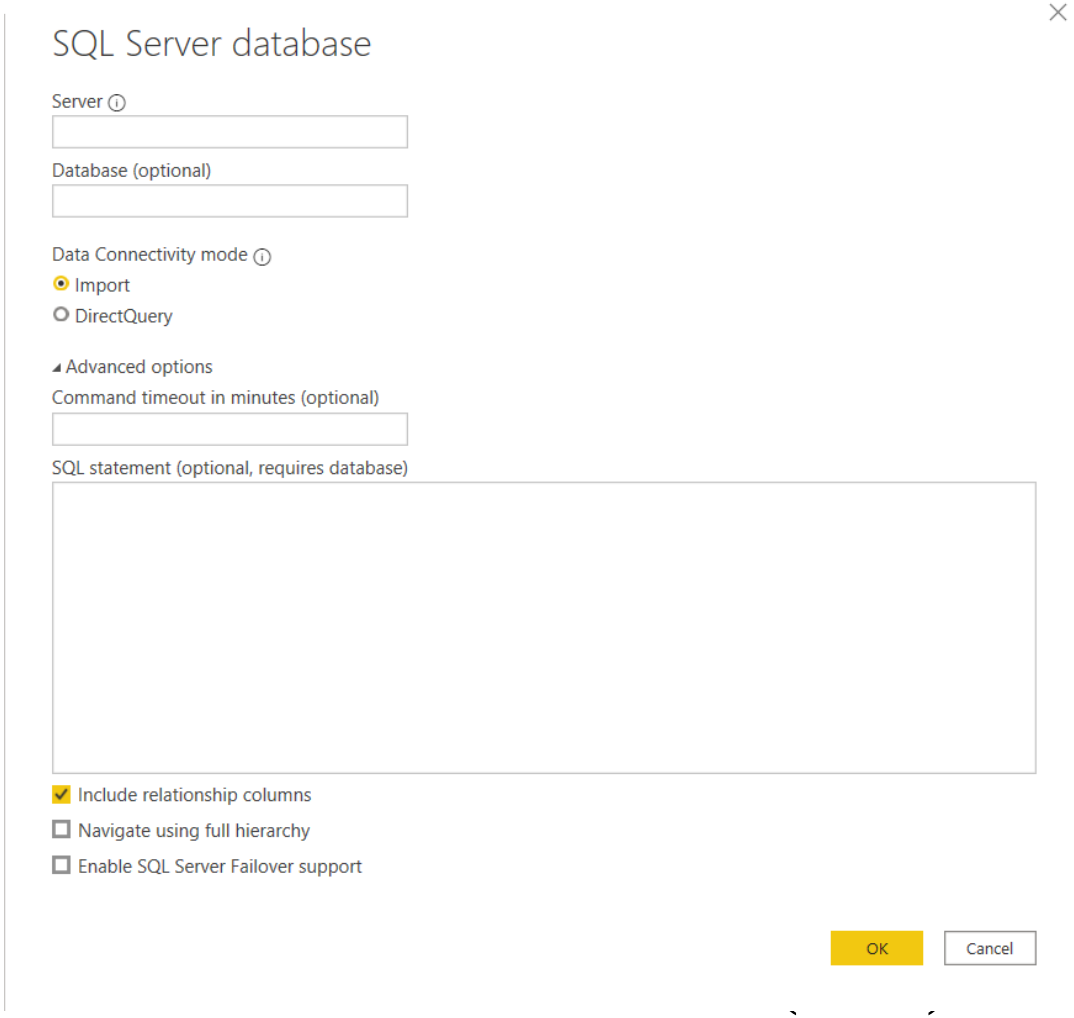
<- inner joint

- Corresponding in DAX:

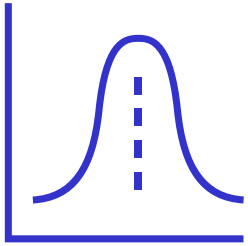
```
Table = SUMMARIZE (
            Sales;
            'Product'[Product];
            "SumOfSales"; SUM (Sales[Units Sold])
)
```

Power BI

SQL


SQL Server database
Server
Database (optional)
Data Connectivity mode
Import
DirectQuery
Advanced options
Command timeout in minutes (optional)
SQL statement (optional, requires database)
Include relationship columns
Navigate using full hierarchy
Enable SQL Server Failover support
OK
Cancel

Power BI



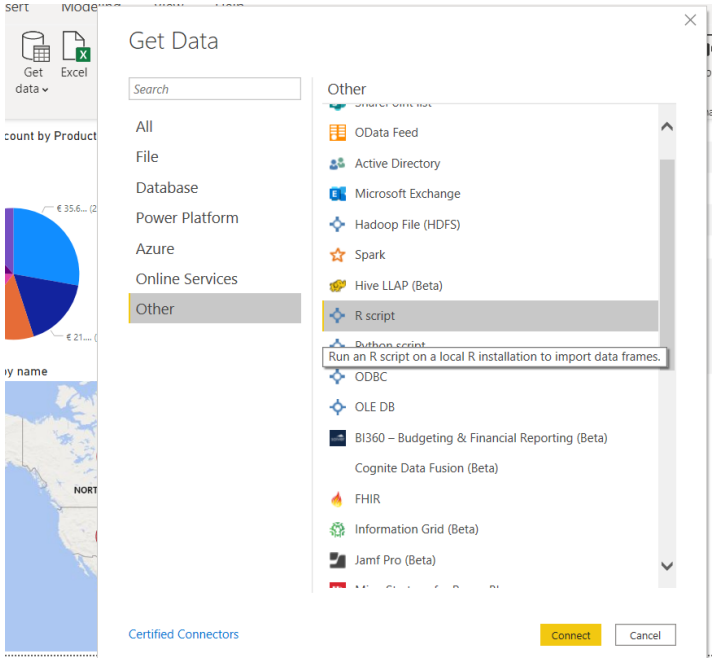
R is a free software environment for statistical computing and graphics.

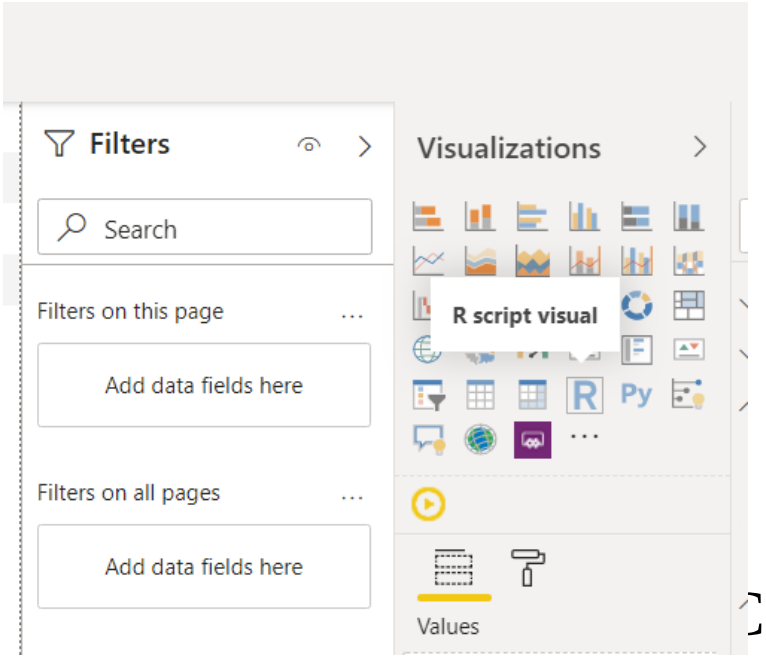
It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

Carlos J. Costa (2022)

Power BI

- Getting Data using script
- Customizing Visualizations





Costa (2022)

- Generic Language
- License: compatible with GNU-GPL
- Guido van Rossum
- https://www.python.org/

Power BI

python™

Python script

Script

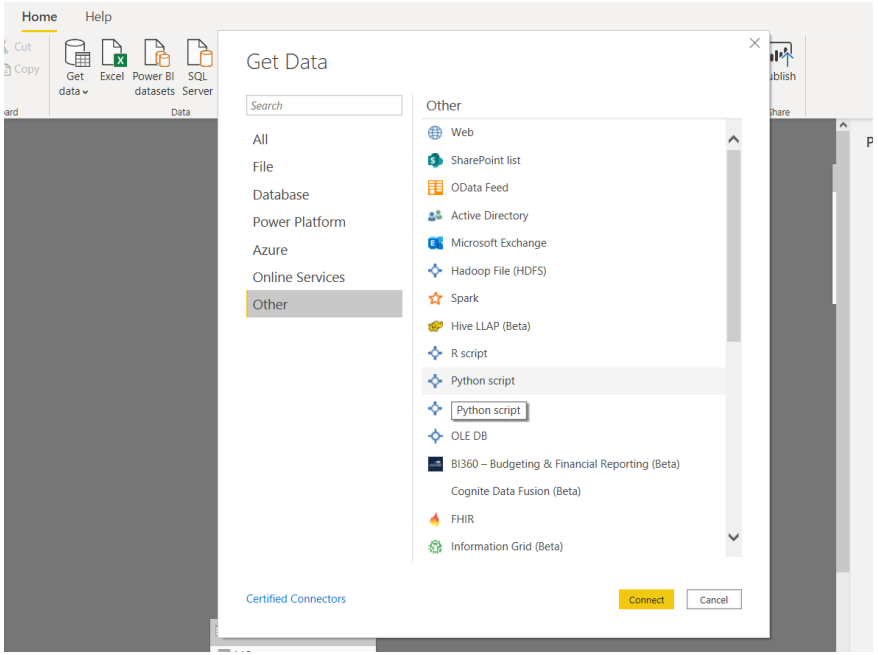
```
import pandas as pd
data = [['Ana',20],['Margarida',20],['Silvia',19]]
df = pd.DataFrame(data,columns=['Name','Age'],dtypr=float)
print (df)
```

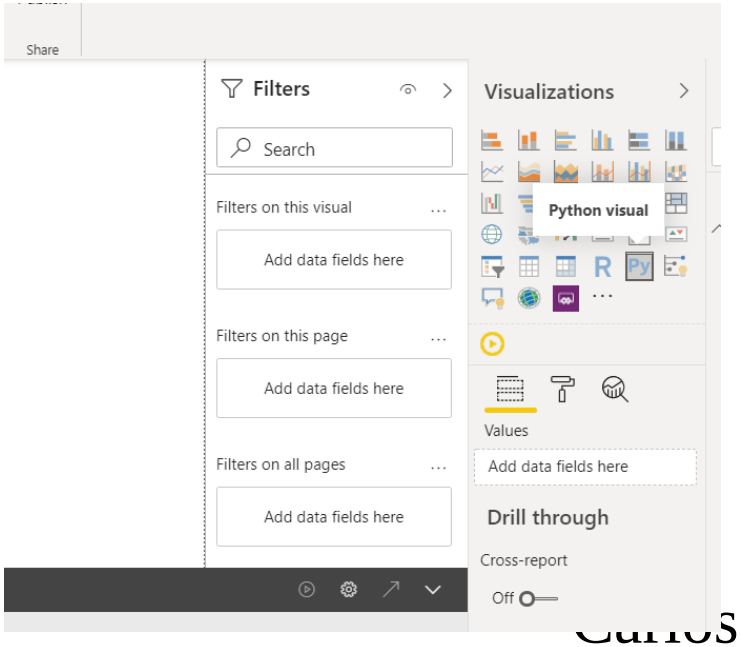
Carlos J. Costa (2022)

Power BI

python™

- Getting Data using script
- Customizing Visualizations





Carlos J. Costa (2022)

References

- https://docs.microsoft.com/en-us/powerquery-m/
- https://docs.microsoft.com/en-us/dax/
- https://docs.microsoft.com/en-us/power-bi/desktop-python-scripts
- https://docs.microsoft.com/en-us/power-bi/desktop-r-visuals