Start with PowerBI

"From Rookie to Rock"

DAX

Explanation

CALCULATE Part 1

Substitution role, Calculation with "FILTER"

Patou Tips #43

1 About CALCULATE (1/3)
Syntax abd definition

If you only need to know and understand one DAX formula, make it this one. **CALCULATE** is the most powerful function in the DAX language. In this new series we will explore step by step how this function works.

Syntax

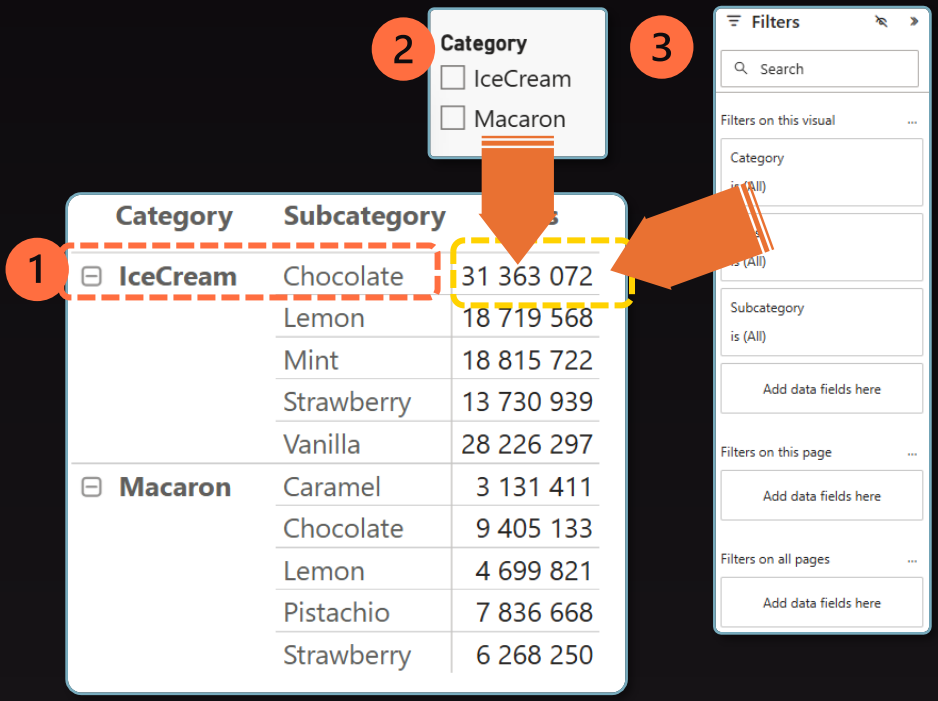
```
CALCULATE ( Expression, Filter 1, Filter 2, …, Filter n)
```

Definition
Evaluates an expression based on a context modified by filters and returns a single value of any type (Scalar).

- ✓ Note 1: The project's modeling structure must be taken into account.
- ✓ Note 2: The number of filters applied can be very large.

1 About CALCULATE (2/3)
Row context and filter context

The CALCULATE function is like a radar that takes into account the elements (filters) available in its environment…



Category	Subcategory	
IceCream	Chocolate	31 363 072
	Lemon	18 719 568
	Mint	18 815 722
	Strawberry	13 730 939
	Vanilla	28 226 297
Macaron	Caramel	3 131 411
	Chocolate	9 405 133
	Lemon	4 699 821
	Pistachio	7 836 668
	Strawberry	6 268 250

The value

31 363 072

is the result of

Row context

1

(IceCream and Chocolate)

Filter context

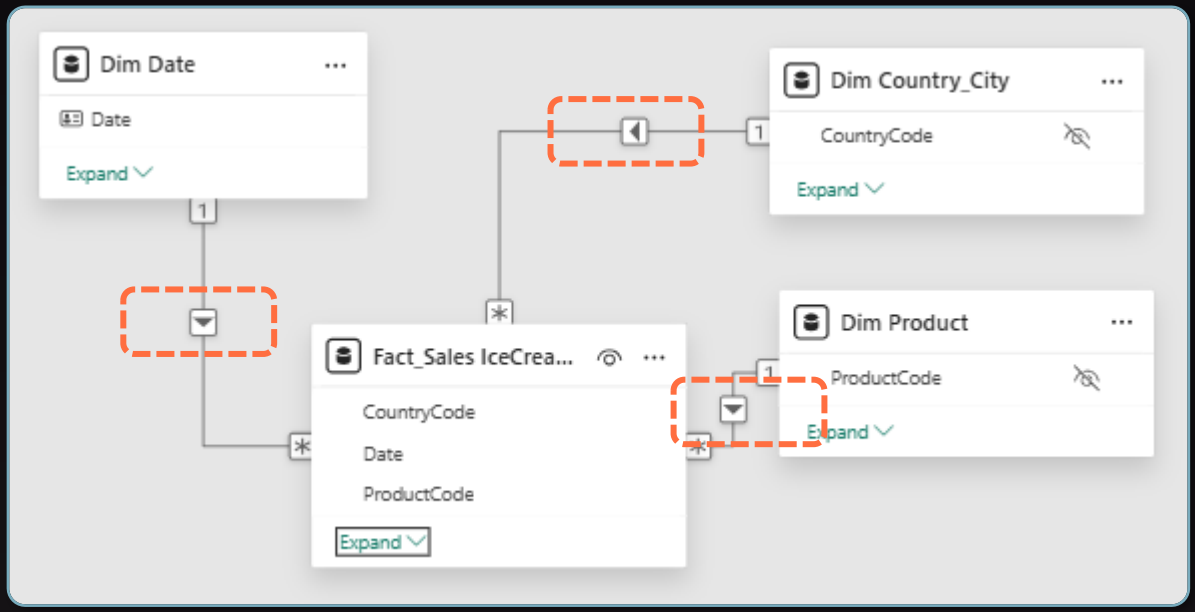
2 3

Slicer or Filters pane

1

About CALCULATE (2/3)
Structure of the modelisation

The CALCULATE function also depends on the project modeling. The "Calculate" function will activate data flows between dimension tables and fact tables.



2 CALCULATE
Substitution role (1/2)

This formula is really interesting, to create a substitute role to better understand the context line.

```
1  Calculate (Substitution Role) =
2      CALCULATE(
3          [Sales],
4          'Dim Product'[Subcategory] = "Chocolate"
5          )
```

Category	Subcategory	Sales
IceCream	Chocolate	31 363 072
	Lemon	18 719 568
	Mint	18 815 722
	Strawberry	13 730 939
	Vanilla	28 226 297
Macaron	Caramel	3 131 411
	Chocolate	9 405 133
	Lemon	4 699 821
	Pistachio	7 836 668
	Strawberry	6 268 250

Category	Subcategory	Sales	Calculate (Substitution Role)
IceCream	Chocolate	31 363 072	31 363 072
	Lemon	18 719 568	31 363 072
	Mint	18 815 722	31 363 072
	Strawberry	13 730 939	31 363 072
	Vanilla	28 226 297	31 363 072
Macaron	Caramel	3 131 411	9 405 133
	Chocolate	9 405 133	9 405 133
	Lemon	4 699 821	9 405 133
	Pistachio	7 836 668	9 405 133
	Strawberry	6 268 250	9 405 133

?

The expected result displays values on all rows, not just the "Chocolate" rows.

2 CALCULATE
Substitution role (2/2)

Explanations about the behavior of the CALCULATE function

```
1 Calculate (Substitution Role) =
2     CALCULATE(
3         [Sales],
4 'Dim Product'[Subcategory] = "Chocolate"
5         )
```

Category	Subcategory	Sales	Calculate (Substitution Role)
⊟ IceCream	Chocolate	31 363 072	31 363 072
	Chocolate	18 719 568	31 363 072
	Chocolate	18 815 722	31 363 072
	Chocolate	13 730 939	31 363 072
	Chocolate	28 226 297	31 363 072
⊟ Macaron	Chocolate	3 131 411	9 405 133
	Chocolate	9 405 133	9 405 133
	Chocolate	4 699 821	9 405 133
	Chocolate	7 836 668	9 405 133
	Chocolate	6 268 250	9 405 133

→ For each row, "Calculate" replaces the value in the "Subcategory" column with the value "Chocolate."
→ For each row, the result depends on the value in the "Category" field (here, Ice Cream or Macaron), and for the "Subcategory" value, "Calculate" replaces the value with the value "Chocolate."
→ This is why the result corresponds to the value of Chocolate in each "Category."

3 CALCULATE
Calculation with "FILTER"

To create a formula that allows you to filter the previous result only on the "Chocolate" lines, the combination with the "FILTER" function is perfect.

```
Calculate (with Filter) =
    CALCULATE(
        [Sales],
        FILTER('Dim Product','Dim Product'[Subcategory] = "Chocolate")
        )
```

Category	Subcategory	Sales	Calculate (Substitution Role)	Calculate (with Filter)
⊟ IceCream	Chocolate	31 363 072	31 363 072	31 363 072
	Lemon	18 719 568	31 363 072	
	Mint	18 815 722	31 363 072	
	Strawberry	13 730 939	31 363 072	
	Vanilla	28 226 297	31 363 072	
⊟ Macaron	Caramel	3 131 411	9 405 133	
	Chocolate	9 405 133	9 405 133	9 405 133
	Lemon	4 699 821	9 405 133	
	Pistachio	7 836 668	9 405 133	
	Strawberry	6 268 250	9 405 133	

The expected result displays values only in the "Chocolate" rows.

Learn and practice

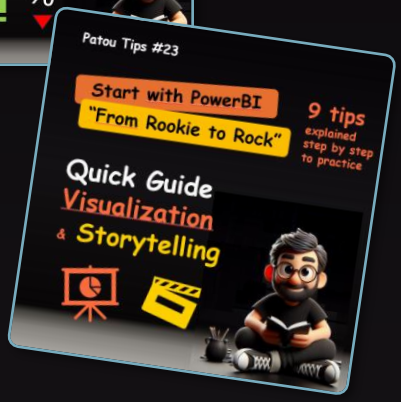
Find past issues of "Patou Tips" and download resources to practice on GitHub

Patou Tips #5
Create a Customized Chart (for income statement)

Patou Tips #6
Create Customized Icon

Patou Tips #7
Create an Age Pyramid Chart (for Human Ressources)

Patou Tips #12
Calculate right evolution for KPI

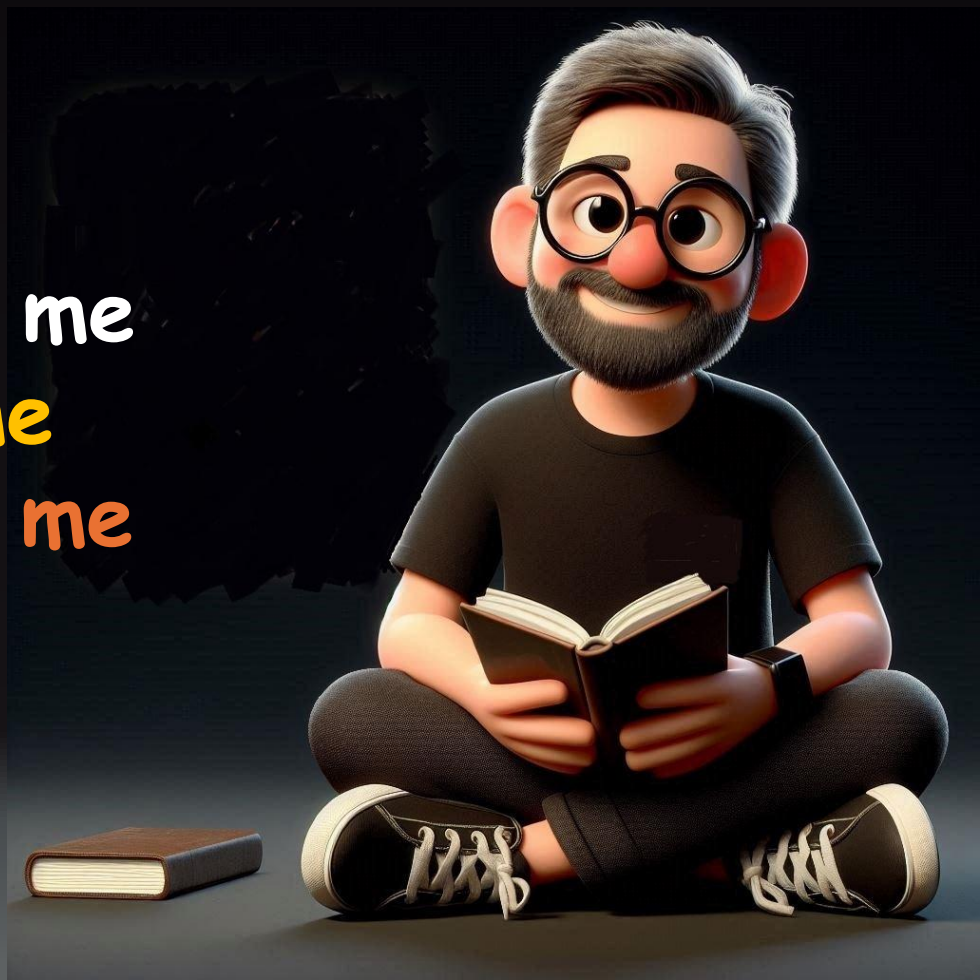


Patou Tips #23
Quick Guide Visualization & Storytelling

Resources on GitHub
https://github.com/PatouTips/Patou-Tips

Don’t forget!
This isn't the truth, it's just my truth!

Patou Tips



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