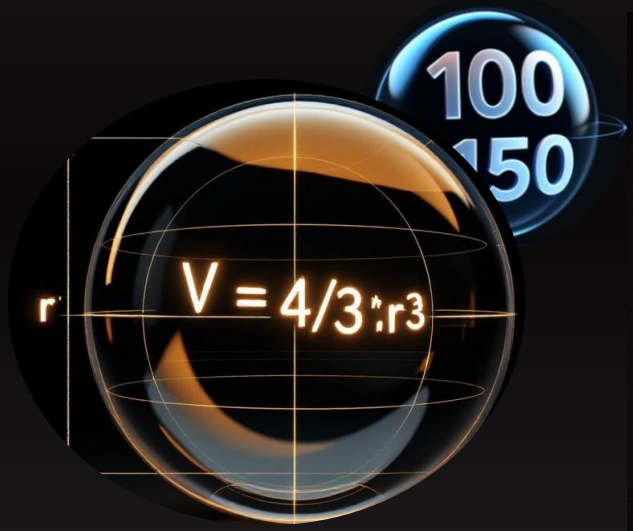
Start with PowerBI & AI

"From Rookie to Rock"

Learn & Practice

Create your own DAX function with UDF



Patou Tips #58

Create your own function with UDF
About UDF (User Defined Function)

The new **UDF** functionality finally allows you to create your own DAX functions, which is very convenient:

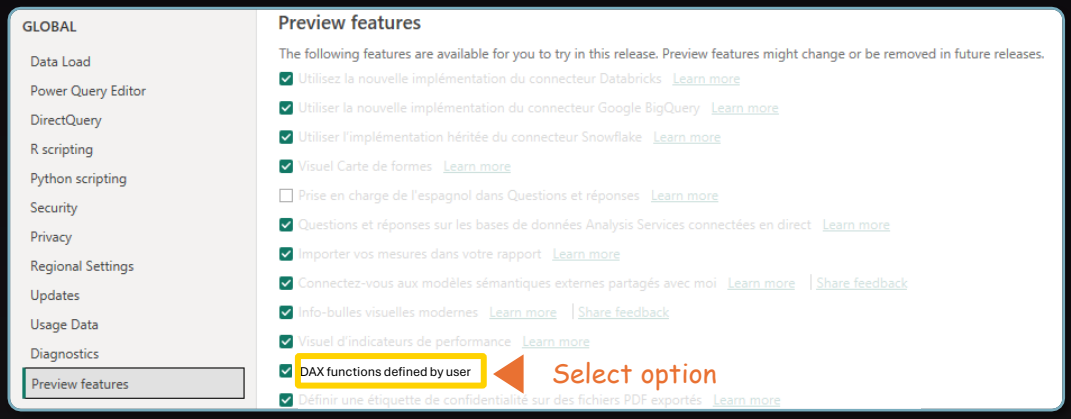
- in terms of reuse,
- as well as business functions specific to your business culture
- or predefined DAX functions that do not exist.

In this "Patou Tips" we will see how to create simple trigonometric and business functions.

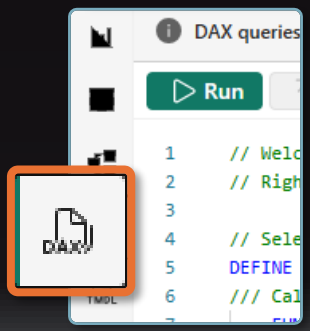
Resources on GitHub
Patou-Tips/#52 Patou Tips (Quick guide to develop faster with TDML) at main · PatouTips/Patou-Tips

Create your own function with UDF
Get Started

1. In Power BI Desktop, go to File > Options > Preview features. Select the "DAX functions defined by user" option, and restart Power BI Desktop



2. Go to the « DAX query view » to start to write your own function



Create your own function with UDF
Syntax for an UDF

The general syntax for an UDF is finally easy.

```DAX
/// Optional description above the function
FUNCTION <FunctionName> = ( <ParameterName>: <ParameterType>, ... ) => <FunctionBody>
```

1. `/// Optional description above the function`

   ➡️ Document this part that help your user to understand your function, because this part appear also when your user start to use your function.

2. `FUNCTION <FunctionName>`

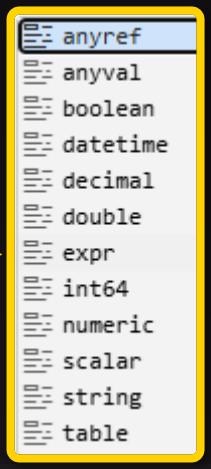
   Define the name of your function by using the DAX function « FUNCTION ».

3. `( <ParameterName>: <ParameterType>, ... ) =>`

   Declare one or more parameters and their type.
   Don't forget to end this declaration with `=>`

4. `<FunctionBody>`

   Write your function.



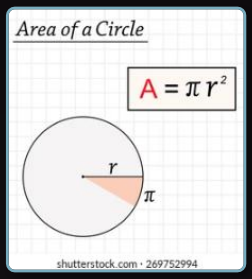
Parameters type

Create your own function with UDF
Geometric function (1/3)

Exemple 1: Area of a circle.

A simple function to calculate the area of a circle.

1. Go to the "DAX query view" to write the following function




```
DEFINE
/// Calculate the area of a circle of a given radius
    Update model: Overwrite function
    FUNCTION Area_Circle =
        (
            Radius :scalar
        ) =>
        PI() * SQRT([Radius])
```

2. Update model with changes (1)

Don't forget to update your function (top of the view).

3. Now you can write a measure

```
Area of a circle = Area_Circle('Measure'[Radius])
```

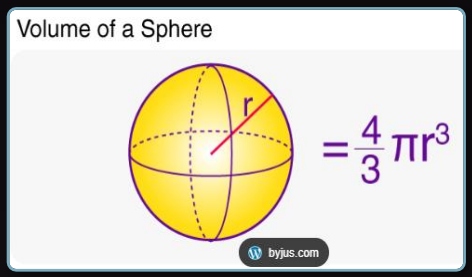
Circle	Radius	Area of a circle
Circle 1	2	4,44
Circle 2	5	7,02
Circle 3	8	8,89
Circle 4	12	10,88
Circle 5	17	12,95

Create your own function with UDF
Geometric function (2/3)

Exemple 2: Volume of a sphere (1/2)

Another simple function to calculate the volume of a sphere.

1. Go to the "DAX query view" to write the following function




```
DEFINE
/// Calculate the volume of a sphere of a given radius
    Update model: Overwrite function
    FUNCTION Volume_Sphere =
        (
            Radius :scalar
        ) =>
        Divide(4,3) * PI() * POWER([Radius],3)
```

2. Update model with changes (1)

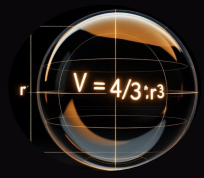
Don't forget to update your function (top of the view).

3. Now you can write a measure

```
Volume of a sphere = Volume_Sphere('Measure'[Radius])
```

Circle	Radius	Volume of a sphere
Circle 1	2	33,51
Circle 2	5	523,60
Circle 3	8	2 144,66
Circle 4	12	7 238,23
Circle 5	17	20 579,53

Create your own function with UDF
Geometric function (3/3)



Exemple 2: Volume of a sphere (2/2)

Another simple function to calculate the volume of a sphere.

4 **Note:** It is essential to clearly explain the "why" of your function, not only for yourself, but especially for your users…

```
DEFINE
/// Calculate the volume of a sphere of a given radius
    Update model: Overwrite function
    FUNCTION Volume_Sphere =
        (
            Radius :scalar
        ) =>
        Divide(4,3) * PI() * POWER([Radius],3)
```

```
Volume_Sphere(Radius: scalar)
Calculate the volume of a sphere of a given radius
1  Volume of a sphere = Volume_Sphere(
                        'Measure'
```

…Thus, when a user writes a measure, the function description will appear in a pop-up window and serve as a guide.

Create your own function with UDF
Business function (1/2)

Exemple 3: Last Year (LY)

Often used in activity reporting, particularly in finance, the value of an activity in the previous year can be reduced to its simplest expression.

```
DEFINE
/// Calculate the previous year's value (YoY) from the current year's value (reference value).
    Update model: Overwrite function
    FUNCTION Last_Year =
        (
            Reference_Value : expr
        ) =>

        CALCULATE(
                Reference_Value, DATEADD(DimDate[Date],-1,YEAR))
```

Exemple 4: YoY absolute variation

Another measure frequently used in activity reporting.

```
DEFINE
/// Calculate the absolute variation in a Value (Reference_Value) compared to its value Year Over Year (YoY).
    Update model: Overwrite function
    FUNCTION YoY_Absolute_Variation =
        (
            Reference_Value : expr
        ) =>

        VAR LY = CALCULATE(
                Reference_Value, DATEADD(DimDate[Date],-1,YEAR))

        VAR Result = Reference_Value-LY

        RETURN Result
```

Create your own function with UDF
Business function (2/2)

Exemple 5: YoY relative variation

Relative variation, combined with absolute variation, allows us to visualize the magnitude of the variation.

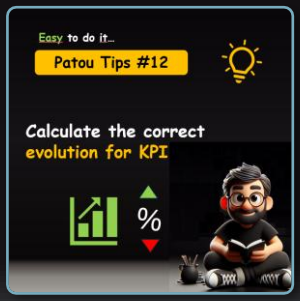
```
DEFINE
/// Calculate the relative variation in a Value (Reference_Value) compared to its value
Year Over Year (YoY). This function also works for negative values, as in finance. The
result must be in decimal format, change it in %.
    Update model: Overwrite function
    FUNCTION YoY_Relative_Variation =
        (
            Reference_Value : expr
        ) =>

        VAR LY = CALCULATE(
                Reference_Value, DATEADD(DimDate[Date],-1,YEAR))

        VAR Result = DIVIDE(
                (Reference_Value-LY), ABS(LY))

        RETURN Result
```

Year	Last Year (LY)	This Year (TY)	YoY absolute	YoY relative
2022				
janv	2 370 663	2 826 560	455 897	19,2 %
févr	2 843 340	2 677 182	-166 158	-5,8 %
mars	2 904 775	2 780 417	-124 358	-4,3 %
avr	2 935 235	2 826 626	-108 609	-3,7 %
mai	2 118 842	3 091 387	972 545	45,9 %
juin	2 293 254	3 339 128	1 045 874	45,6 %
juil	2 920 484	4 248 771	1 328 287	45,5 %
août	3 801 135	5 432 050	1 630 915	42,9 %
sept	4 229 031	4 525 100	296 069	7,0 %
oct	3 852 219	3 963 715	111 496	2,9 %
nov	2 674 993	3 160 262	485 269	18,1 %
déc	3 225 220	4 198 802	973 582	30,2 %



See Patou Tips #12 about the calculation of the relative variation

Coming soon, in 2026!

Patrice Fayard

Business Intelligence WORKBOOK

Start PowerBI

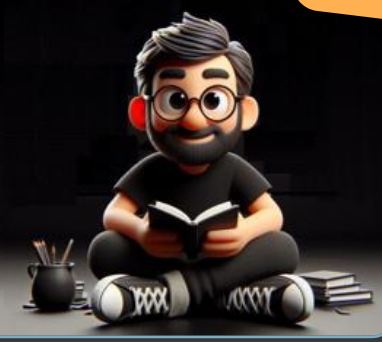
"From Rookie to Rock"

To **develop your knowledge**, find more explanations and exercises

Over **500 pages** to learn and practice: **video tutorials and resources**

Learn & Practice

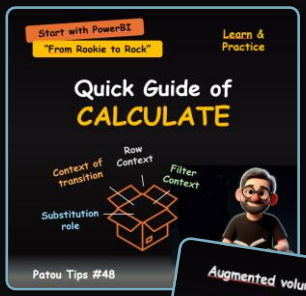
- ✓ 1000 Video tutorials
- ✓ 500 Step by step
- ✓ 5 Cheat Sheet
- ✓ 100 Power Patou Tips
- ✓ Hacking & Workshops



Learn and practice

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

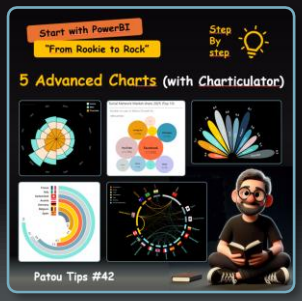
Patou Tips #22
PowerBI projects with Teams



Patou Tips #48
Quick Guide of CALCULATE

Patou Tips #25
Start with PowerBI: The complete Guide

Patou Tips #23
Quick Guide Visualization & Storytelling



Patou Tips #42
5 Advanced Charts (with Charticulator)

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

Patou Tips

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

Follow me
Like me
Share me