

DEMYSTIFYING DAX

An Introduction to Data Analysis eXpressions

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Agenda

DAX Overview

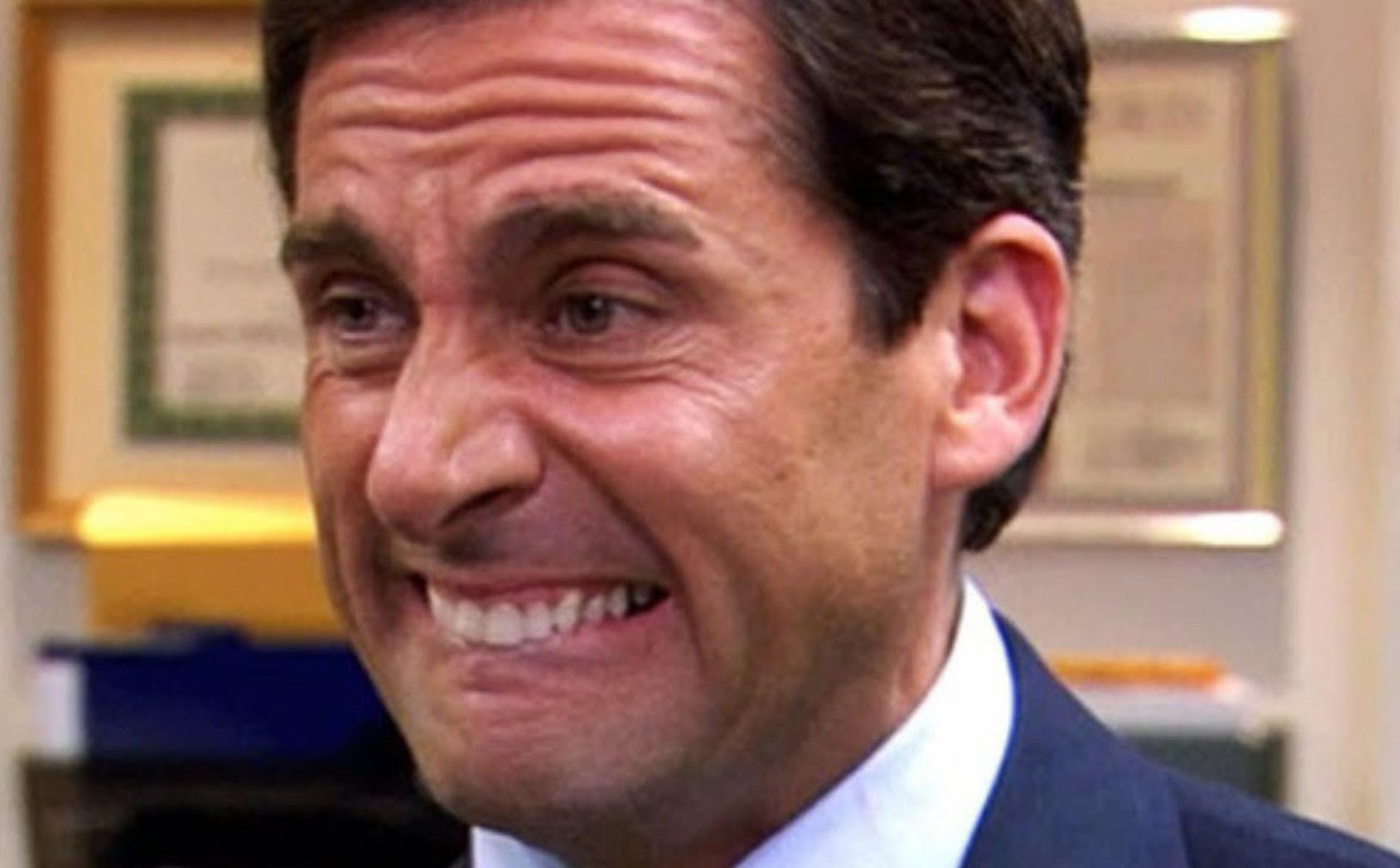
DAX Resources

Consider the Context

DAX Learning Path

Demo







CLEVELAND





WHAT

is DAX?

DATA ANALYSIS EXPRESSIONS

- **Functional language**
- **Created in 2010 for PowerPivot in Excel**
- **Similar syntax to Excel formulas**
- **Created specifically for working with data models**

“DAX is simple, but it is not easy”

-Alberto Ferrari



DAX

Prerequisites?

No prior coding experience necessary!

**Solid, working knowledge of
data modeling & star schemas**

**Experience with Excel formulas
is beneficial**



WHO

should learn to
write DAX?



WHY

should analysts
learn to write
DAX?



WHY

should analysts
learn to write
DAX?

250+ DAX functions at your disposal

Implement custom business logic

Perform complex calculations

Utilize time intelligence functions

Extend formatting options in visuals



Power BI



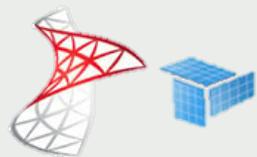
Microsoft Fabric



Power Pivot for Excel



Azure Analysis Services Tabular



SQL Server Analysis Services Tabular



WHERE

can DAX be
written?



DAX Studio



Tabular Editor



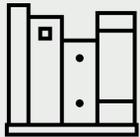
WHERE

can DAX be
written?



HOW

should analysts
learn to write
DAX?



DAX

Resources



Microsoft DAX Function Reference

learn.microsoft.com/en-us/dax/dax-function-reference

Official DAX reference guide with syntax and information for all DAX functions



DAX Guide

dax.guide/

SQL BI DAX reference guide with syntax and information for all DAX functions



SQL BI

www.sqlbi.com/

Marco Russo & Alberto Ferarri's blog, training, & resources



DAX Formatter

www.daxformatter.com/

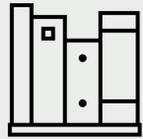
Make your DAX easy to read with this free formatting tool!



DAX Patterns

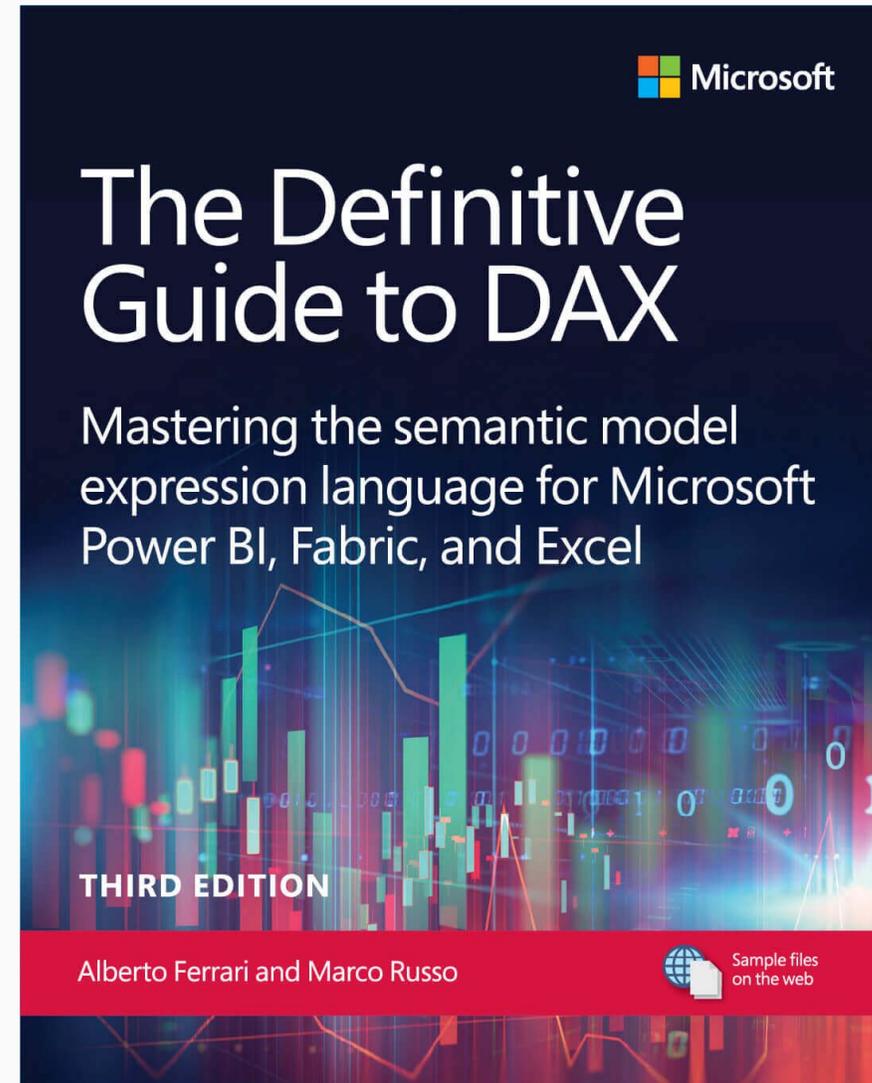
www.daxpatterns.com/

Reusable, complex DAX for ranking, cumulative totals, comparing different granularities, etc.



DAX

Resources





AI + DAX

=

CAUTION



HOW

should analysts
learn to write
DAX?



HOW

should analysts
learn to write
DAX?



HOW

should analysts
learn to write
DAX?



DAX is Used to Create...

Measures



Flexible calculations that can be used multiple times in Power BI visuals, Excel PivotTables, and more



Calculated Columns



The DAX expression is calculated for every row in the table



Calculated Tables



The DAX expression creates a new table in the data model

Queries



Write DAX to pull data out of a Semantic model in the form of a "temporary" table.

Visual Calculations

Calculations that exist in the context of a single Power BI visual.

DAX User Defined Functions

Reusable, parameterized DAX packages



Consider the Context

Evaluation Context

“All DAX expressions are evaluated inside a context. The context is the ‘environment’ within which a formula is evaluated.”

- Marco Russo & Alberto Ferrari, The Definitive Guide to DAX



Consider the Context

Filter Context

“The set of filters applied to the data model before the evaluation of a DAX expression starts.”

- Marco Russo & Alberto Ferrari

Row Context

To complete their aggregations, some DAX functions iterate over every row in a data table and need to know what row they are on. The “current row” is the row context.



DAX Learning Path

DAX 101

- Data modeling & DAX syntax
- Aggregation Functions:
COUNTROWS(), SUM(),
COUNT(),
DISTINCTCOUNT(),
AVERAGE(), MIN(), MAX()
- IF()
- Basic Operators
- DIVIDE()
- Introduce
CALCULATE()
- Basic filters in
CALCULATE()
- Nesting measures
- DAX Variables

DAX 201

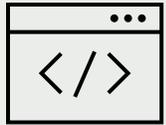
- Iterator Functions:
SUMX(), AVERAGEX(),
MINX(), MAXX(),
CONCATENATEX()
- Evaluation Context
- CALCULATE Modifiers:
FILTER(), ALL(),
ALLSELECTED(), etc.
- Complex filters in
CALCULATE()
- Visual Calculations
- SWITCH()
- Context Switching

DAX 301

- Time Intelligence
Functions:
TOTALYTD(), TOTALMTD(),
SAMEPERIODLASTYEAR(),
DATEDIFF(),
DATESINPERIOD(), etc.
- Calendar Based Time
Intelligence

DAX 401

- Custom Time
Intelligence
- Implement DAX
patterns
- DAX queries
- Calculation Groups
- DAX UDFs (User
Defined Functions)



DAX Syntax

'Sales' Sales

Reference to a table

Table names containing spaces require single quotes,
single word table names do not

Sales[Unit Cost]

Reference to a column in a table

[Total Sales]

Reference to a DAX measure

DAX Comments

```
// This is a single line comment
```

```
-- This is a single line comment
```

```
/* This is a comment
```

```
that has multiple lines */
```

DEMO



DAX Tips

Use comments to document your DAX

Format your DAX code to keep it readable

Apply formatting to your DAX measures

Currency symbols, decimal places, thousand separator



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