

Power BI - DAX

Course Overview - 1-day course

Increase your DAX proficiency

This course is designed to extend on and embed the foundations of DAX (contexts, rules of evaluation etc.) so you can begin to put that knowledge into practice. You will expand your awareness and knowledge of various DAX functions as well as learn some 'ins and outs' of writing efficient expressions.

What do I need to know to attend?

- Attended our Power BI Advanced course or equivalent knowledge and skill
- Source / model data and create basic tables, columns and measures with DAX
- Understanding general concepts of data modelling
- General knowledge of DAX and awareness of evaluation contexts
- Advanced Excel skills is desired, knowledge of scripting concepts an advantage

Learning Outcomes

- An appreciation of the evaluation contexts and engine behind DAX
- Write expressions more confidently using DAX with a wider range of functions
- Make use of tools to compliment creating and managing DAX
- Create more complex expressions using methods to build and prove an outcome
- Use techniques to optimise an expression for better efficiency

Detailed Content

Course Introduction

What is DAX
DAX Functions
DAX Contexts
What is Vertipaq
DAX efficiency
DAX references
DAX best practices

Recap of Contexts

Introduction to Contexts
Recap of DAX Contexts
The Row Context
The Filter Context
Measures and Calculated Columns
Dataset for exercises – Computer Store sales
Filter and Row Context in a measure
The CALCULATE function
Context Transition

Filter expressions of CALCULATE
Rules of Evaluation
CALCULATE and FILTER

Contexts in Calculated Columns

Introduction to Columns
Row Context in Calculated Columns
Filter Context in Calculated Columns
Relationships in Row Contexts
The RELATED function
The RELATEDTABLE function
Using RELATEDTABLE in a column
CALCULATED in row contexts
Row to Filter Context
Transformation
Whiteboard Exercise on row to filter contexts
Duplicates in the transformation
The LOOKUPVALUE function

Row Contexts in Measures

Introduction to Row Contexts
Row Contexts in Measures
Simple iterator in a measure
Row Context and a related table
Some more calculations exercise
Re-using measures
Implicit CALCULATE in a measure
An alternative approach using variables

Functions and FILTER

Introduction to DAX functions
Time Intelligence functions
Date (Dimension) tables
Using in-built TOTALYTD
Date modifier functions
Using date modifier
DATESBETWEEN
Using date modifier DATESYTD
The magic behind Date Table functions
The case for simplicity – MAX or LASTDATE

Power BI - DAX

Understanding the FILTER function
Contexts in the FILTER function
The filter context in functions
Naked column references
Simple filter expression
Comparing a value in the filter context
Adding another filter condition
The value of VALUES

Table Functions

Introduction to Table functions
Summarising Tables
Using SUMMARIZE alone
The problem with SUMMARIZE
Using ADDCOLUMNS and SUMMARIZE
Using SUMMARIZECOLUMNS as a better alternative
A summary table in a measure

Practical DAX

Introduction to DAX calculations
Comparing functions – min/max and time intelligence
Debugging with DAX
Alternative patterns
The Quick Measure version
The KEEPFILTERS function
The TREATAS function
A few ORs or TREATAS
Using TREATAS and KEEPFILTERS
Using TREATAS for virtual relationships

DAX Tools

Use of third party tools
Introducing DAX Studio
What is DAX Studio
Download and Install DAX Studio
The DAX Studio Interface
How DAX Studio connects to the data

Viewing data model information
Creating a table query
Ordering a query result
A query returning a scalar
Defining a Measure
Declaring a variable
Incoming filter context

DAX Performance

Introduction to DAX Performance
The basics of the Vertipaq engine
Where is Vertipaq
A database of columns
Compression of a column
Identifying column compression
Understanding the TABLE_ID column
Power Query data statistics
Data Model Normalisation
Introduction to the Query Plan
Overview of the engines
The Formula Engine
The Storage Engine
Capturing a query
Special process to capture Power BI queries
Re-loading Power BI visuals
Understanding the query information from the capture

DAX Optimisation

Introduction to optimising DAX
Clear the Cache
Server Timings
Explaining the Server Timings
Steps to improve performance
Redefine a measure
The datacache
Optimisation by the Vertipaq engine
The CallbackDataID function
Reducing CallbackDataID instances
Optimising a Query in the Storage Engine
Viewing the Query Plan
Comparing two statistical functions

Extended Topics: Table Joins

Introduction to Table Joins
The Inner Join
A join on unrelated tables - TREATAS
The Outer Join
The Cross Join
Using GENERATE for Joins

Nested Row Context

Introduction to Nested Rows
How Nested Rows work
The EARLIER function
The EARLIEST function
Create a nested row in a column
How to avoid complex nesting expressions
Using variables to store values before nesting
Avoid iterators where possible
Further improve the efficiency of an expression

Ranking

Introduction to Ranking
Arguments in RANKX
Create a calculated column for ranking
Sort order of ranking
Definitions when ranking ties
Breaking Ties Manually
Creating a measure for ranking
Adjustments to make the RANKX measure work