Introduction to DAX

Discussion + Live Demo

Overview

What is DAX?

Why use DAX in Power BI?

DAX for Excel users

DAX for SQL users

What is DAX?

Programming Language

What is a Data Model?

Data Relationships

Power BI: Introduction to Business Analytics

Course Author: Joshua Michalik

Data
Analysis
e**X**pressions

Power BI: Introduction to Business Analytics

Course Author: Joshua Michalik

Programming Language

Simple language

Language of Microsoft SQL Server Analysis Services (SSAS)

Released with PowerPivot in Excel 2010

Excel uses DAX to create Power Pivot data models

What is a Data Model?

Data Model
A set of tables linked by relationships

Table
A set of rows containing data divided by columns

Relationship
A column containing the similar data in 2 related tables.

Data Relationships

1 to 1
A row of data in one table matches only one row in another table.

1 to Many
A row of data in one table matches one or more rows in another table.

Many to 1
One or more rows of data in one table matches only one row in another table.

Many to Many
One or more rows of data in one table matches one or more rows in another table.

Why use DAX in Power BI?

Why use DAX in Power BI?

Designed to use with tables

Useful for advanced data modeling

Especially useful for specialized data columns

- Calculated Columns (data by row)
- Measures (e.g. aggregated data)

DAX for Excel users

Similar to Excel formulas

Power BI: Introduction to Business Analytics

Cells vs Tables

Excel vs DAX functions

Using Iterators

Course Author: Joshua Michalik

Cells vs Tables

Excel mainly uses cell coordinates such as **A2**, **D6**, and **F38**.

Excel uses **[@column]** references to refer to a specific row.

Excel can uses **[column]** references (*no* @) to refer to an entire column.

DAX uses **Table[Column]** to refer to either a specific row or an entire column automatically

Functional Languages

Both Excel and DAX are functional languages.

All expressions are function calls.

No statements, loops, or jumps.

In DAX, everything is an expression.

Not surprising for Excel users.

Using Iterators

Excel uses only one calculation at a time.

DAX uses a more abstract concept called iterators.

Excel limits calculations to a separate cell or column for a single calculation

DAX allows running calculations on many rows and then combining the calculations for a final result.

DAX for SQL users

Relationship Handling

Functional vs Declarative

Both Programming & Query

Subqueries

Power BI: Introduction to Business Analytics

Course Author: Joshua Michalik

Relationship Handling

Relationships in SQL must be explicitly identified when using **JOIN table ON column**.

In DAX, all relationships are inferred by the data model and are not included in the query.

Functional vs Declarative

Functional (DAX)

How to perform a query

Functions within functions

Responsible for optimal code

Declarative (SQL)

What result you need from a query

Functions not used

Limited control on optimization

Both Programming & Query language

DAX is simpler than SQL

In SQL, specific parts of language used for stored procedures, views, etc.

In DAX, both querying and programming use the same keywords (same language).

In DAX, queries can manipulate and return tables.

Subqueries

In SQL, subqueries are queries within queries.

In DAX, subqueries are functions within functions. Or a function which returns a table to its outer function.

“Subqueries” in DAX feels much more natural than in SQL

Review

Review

Why was DAX developed originally?

How is DAX similar to Excel functions?

How are SQL queries and DAX related?