

# DAX for SQL Developer

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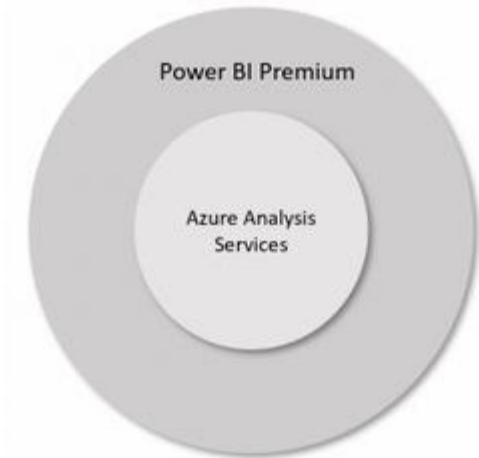


# Agenda

- DAX Info
- Tools
- Modeling
- SQL vs DAX

# Why DAX?

- Sooner or later you will touch Power BI.
- Query language for VertiPaq Engine
  - SSAS Tabular
  - Power BI
  - Excel Power Pivot
  - AAS (SSAS Azure)
- All SSAS features will be/are part of Power BI



# DAX flavors

- DAX disciplines
  - Writing Calculations (Measures)
    - Target to show correct values in any situation
    - Like writing SQL function
  - Writing queries as a source for data for reports
    - Target is to get dataset
    - Like writing SQL queries

# Tools which helps you

- Power BI Desktop
  - Performance analyzer
- DAX Studio for both PB, SSAS
  - Build Query
  - Trace Queries
  - Write Query
  - Tune Query

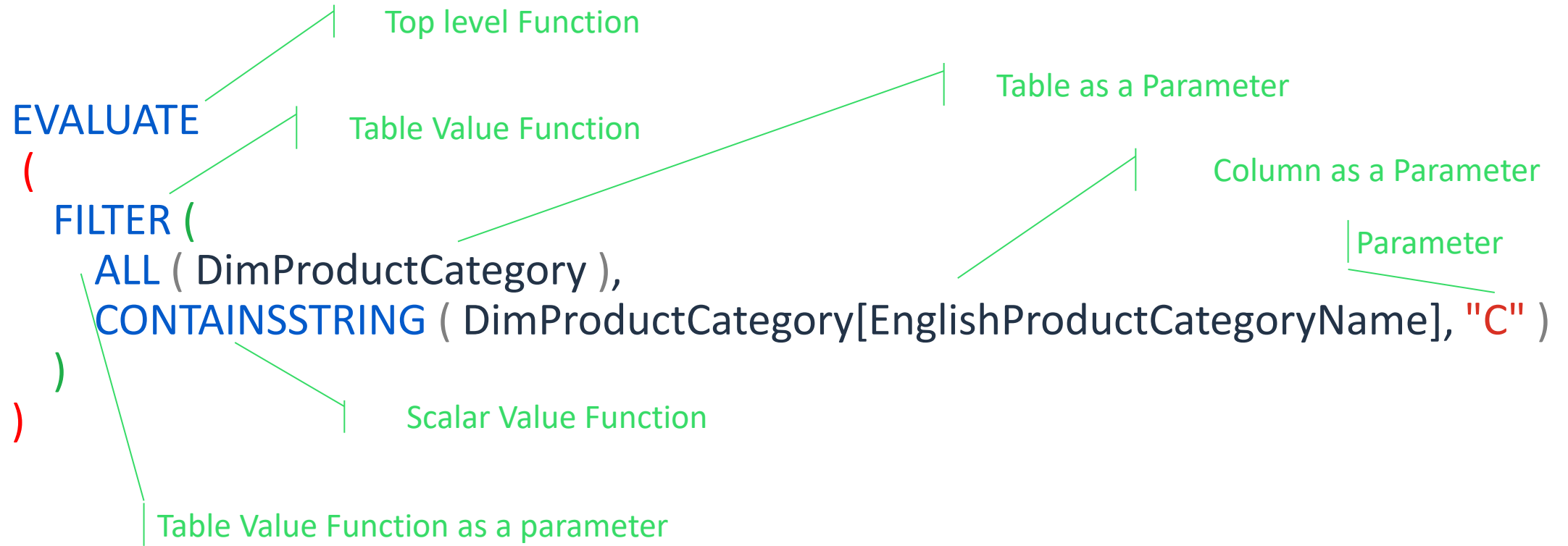
# DAX – Functional Language

- DAX is a functional language
- SQL Functions
  - Table Value
  - Scalar Value

**Imagine DAX as if you write whole SQL select only with those two types of functions!!**

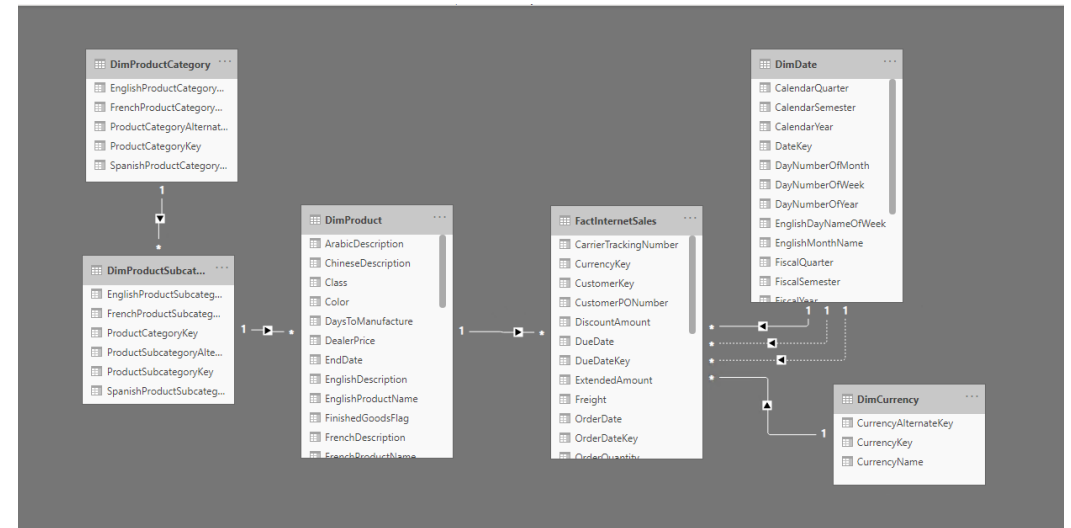
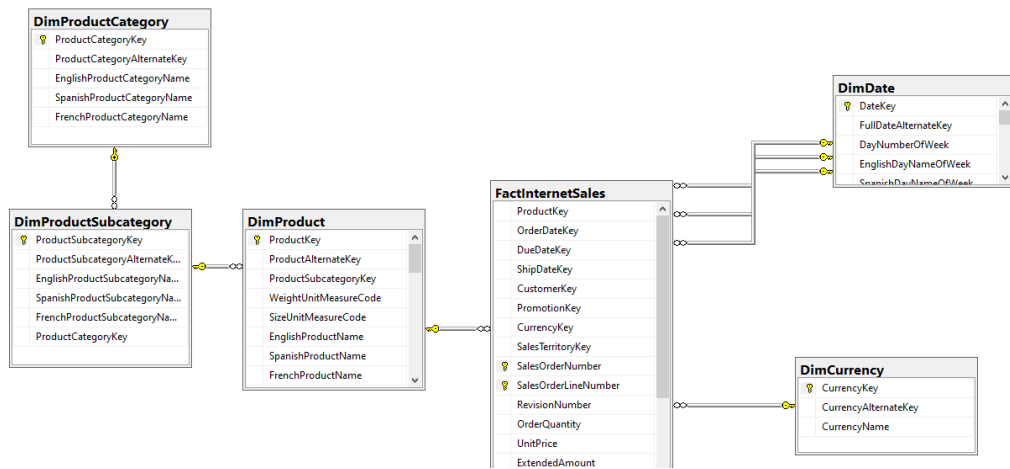
# DAX – Functional Language

- Example of simple select with filter



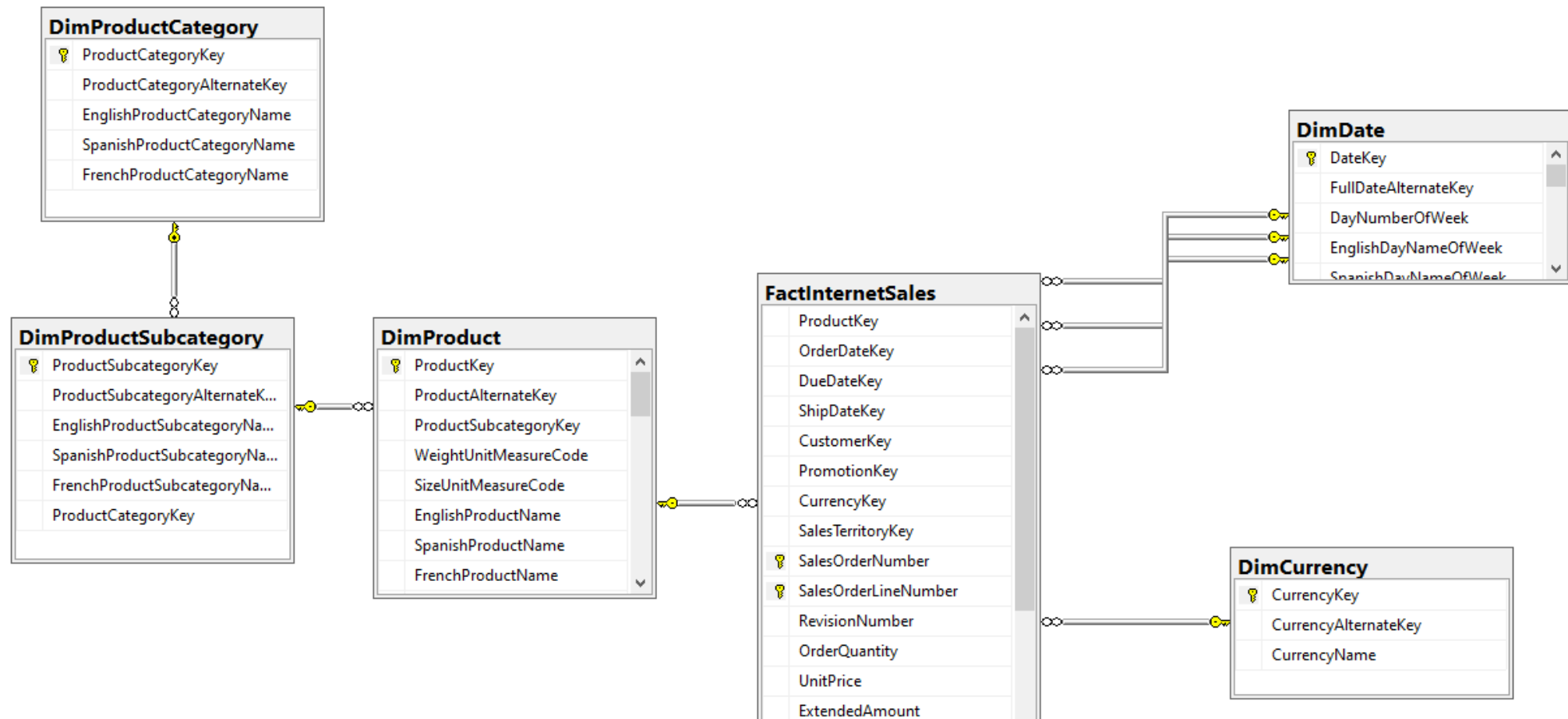
# Modeling

- Relational schema vs Vertipaq model

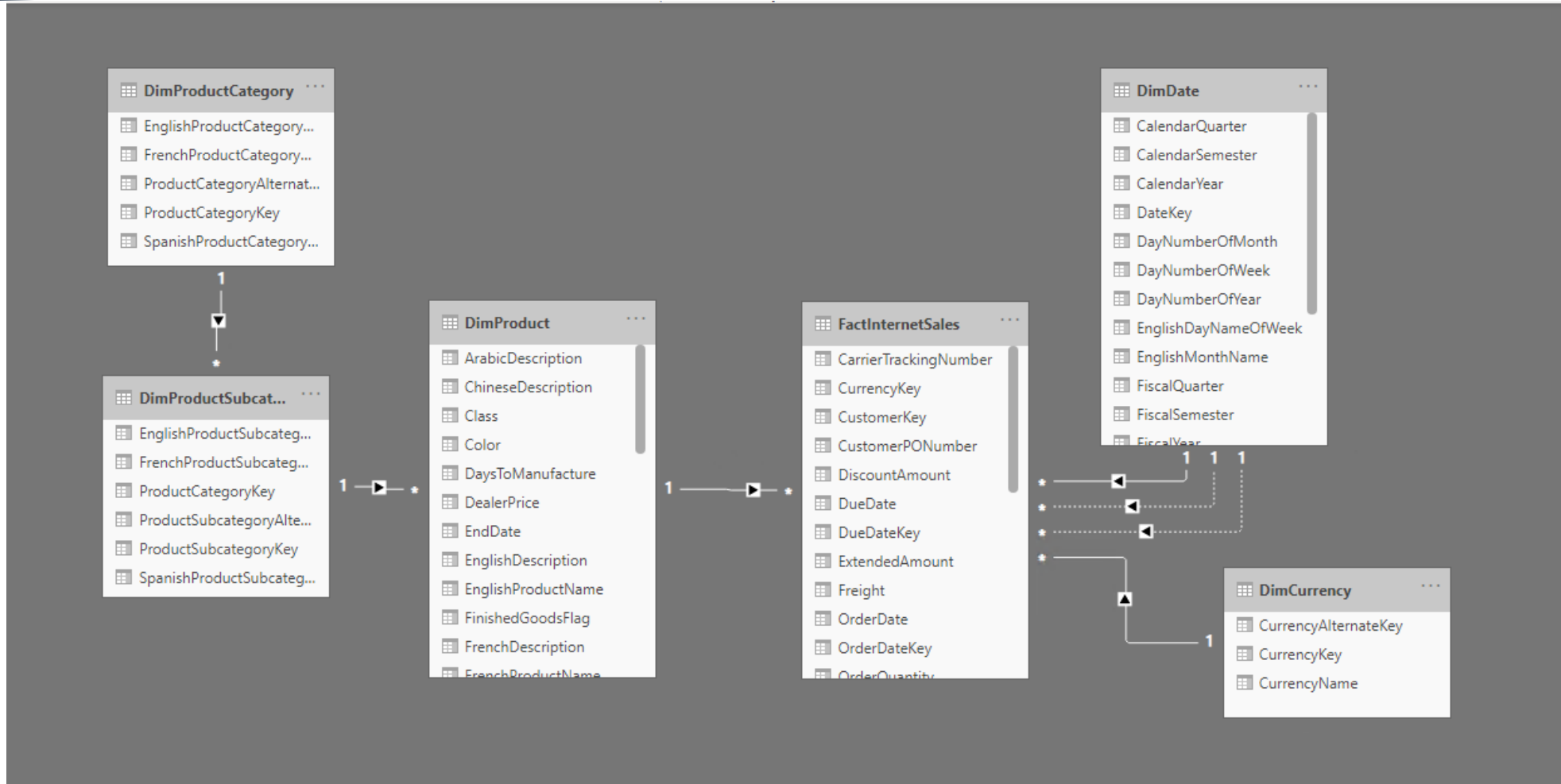




# Modeling – Relational Schema



# Modeling – Vertipaq Model



# Relational schema vs Vertipaq model

- In SQL you can join even when FK is not there.
- In SQL you must declare how to join two tables
- In DAX “join” is driven by model
- \*In DAX Filter works only one way 1 -> Many
- Concept of expanded tables in DAX

# Modeling – Expanded Tables Concept

Amount	Order ID	ProductKey
100	1	10
150	2	20
160	3	30

Internet sales



ProductKey	Color	Class	ProductSubCategoryKey
10	Red	Street	100
20	Blue	Street	200
30	Red	Street	200

Product



ProductSubCategoryKey	SubCategoryName	ProductCategoryKey
100	Shirt	1100
200	Hoodie	1100

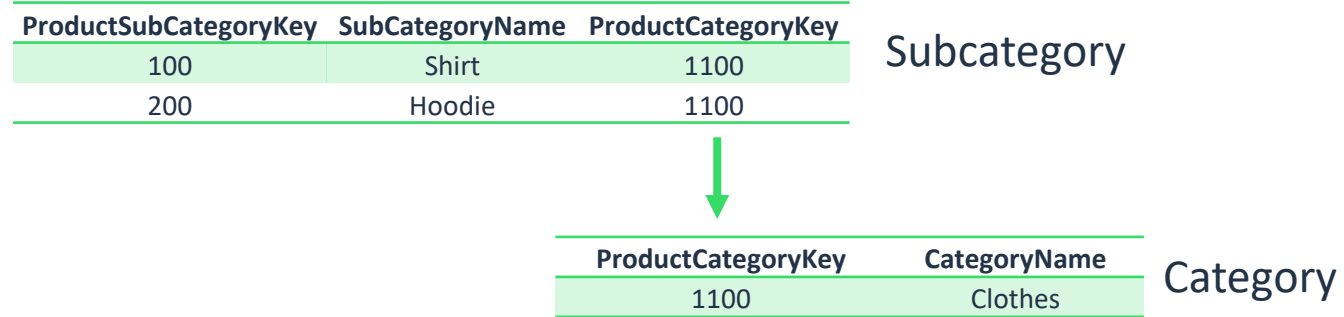
Subcategory



ProductCategoryKey	CategoryName
1100	Clothes

Category

# Modeling – Expanded Tables Concept



# Modeling – Expanded Tables Concept


ProductSubCategoryKey	SubCategoryName	CategoryName
100	Shirt	Clothes
200	Hoodie	Clothes

Subcategory + Category

# Modeling – Expanded Tables Concept

ProductKey	Color	Class	ProductSubCategoryKey
10	Red	Street	100
20	Blue	Street	200
30	Red	Street	200

Product



ProductSubCategoryKey	SubCategoryName	ProductCategoryKey
100	Shirt	1100
200	Hoodie	1100

Subcategory



ProductCategoryKey	CategoryName
1100	Clothes

Category

# Modeling – Expanded Tables Concept

ProductKey	Color	Class	SubCategoryName	CategoryName
10	Red	Street	Shirt	Clothes
20	Blue	Street	Hoodie	Clothes
30	Red	Street	Hoodie	Clothes

Product + Subcategory + Category



# Modeling – Expanded Tables Concept

Amount	Order ID	ProductKey
100	1	10
150	2	20
160	3	30

Internet sales

↓

ProductKey	Color	Class	ProductSubCategoryKey
10	Red	Street	100
20	Blue	Street	200
30	Red	Street	200

Product

↓

ProductSubCategoryKey	SubCategoryName	ProductCategoryKey
100	Shirt	1100
200	Hoodie	1100

Subcategory

↓

ProductCategoryKey	CategoryName
1100	Clothes

Category

Expanded Fact Tables contains all columns of all related tables

# DAX – Basics

- DAX Language functions reference
  - <https://dax.guide/>

SQL

```
SELECT * FROM dbo.DimProductCategory
```

DAX

```
EVALUATE ( DimProductCategory )
```

# DAX – TOP( N)

```
SELECT TOP 3 *  
FROM dbo.DimProductCategory pc  
ORDER BY pc.EnglishProductCategoryName
```

---

```
EVALUATE  
(  
  TOPN (  
    3,  
    DimProductCategory,  
    DimProductCategory[EnglishProductCategoryName]  
  )  
)
```

# DAX – Joining

- SQL
  - Not depend on the relationship in the data model
  - You can use any column of a table in a JOIN condition
- DAX
  - Leverage relationship
  - Use Join functions
    - With Data Linage
    - Without Data Linage
  - CrossJoin

# DAX – Filtering, Union

- Filtering
  - Basic
    - Filter
    - Calculate
  - IN
  - String based
- Union

# Execution Plans

Málem bych zapoměla, exekuční plány, máte?



A mohla bych je vidět?

# Presenter

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# Q&A



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