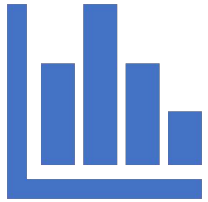

Power BI Masterclass

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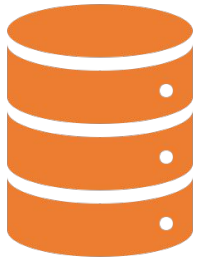
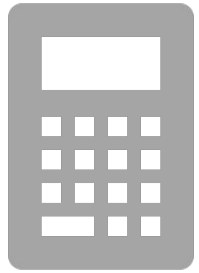
Course Overview



Data Modeling Concepts



DAX with Practical Examples

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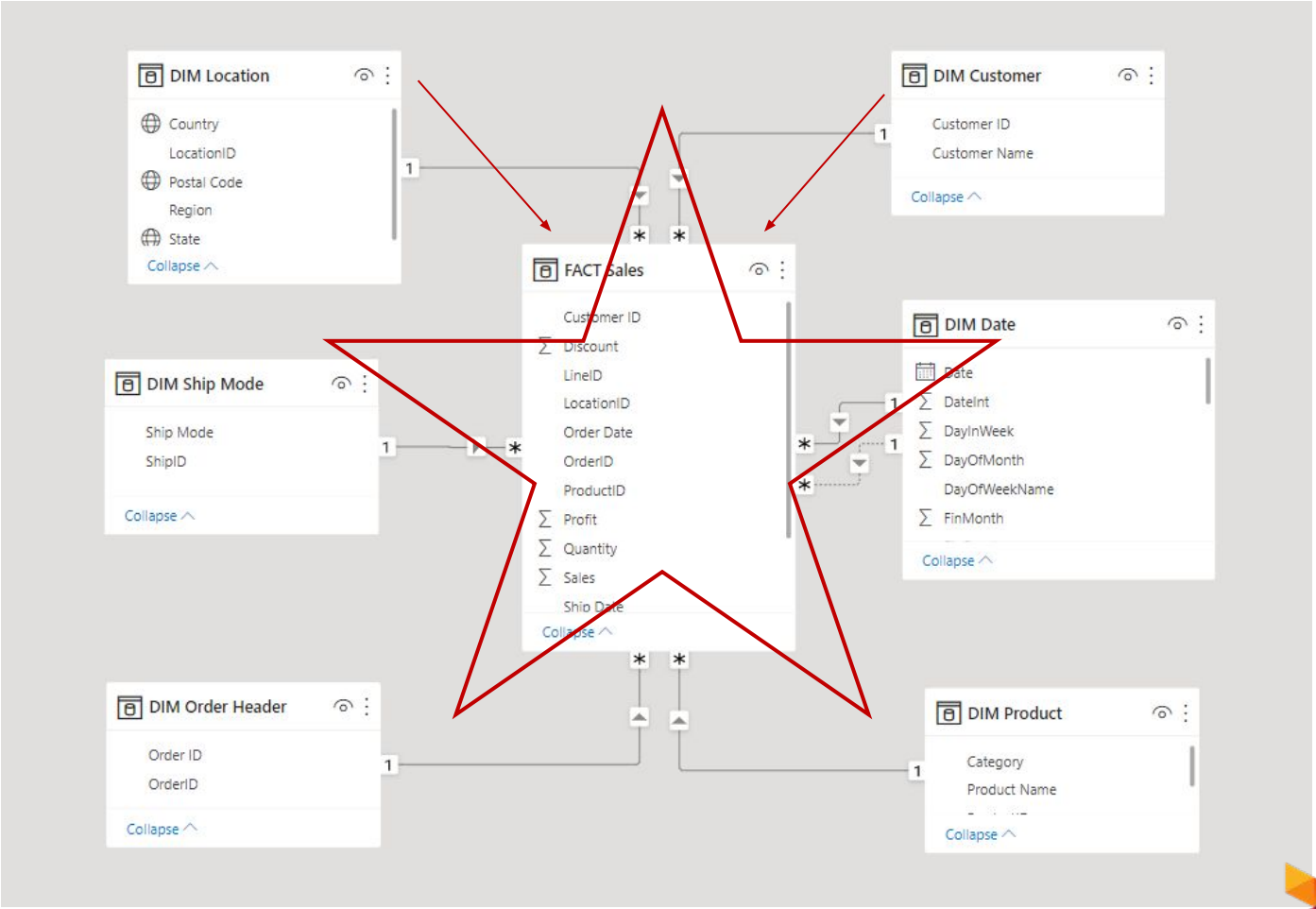
Designing a Data Model

Define Tables

- Fact tables
- Dimension Tables

Build Relationships

- One-to-many
- From dimension to fact
- Single directional
- Star schema



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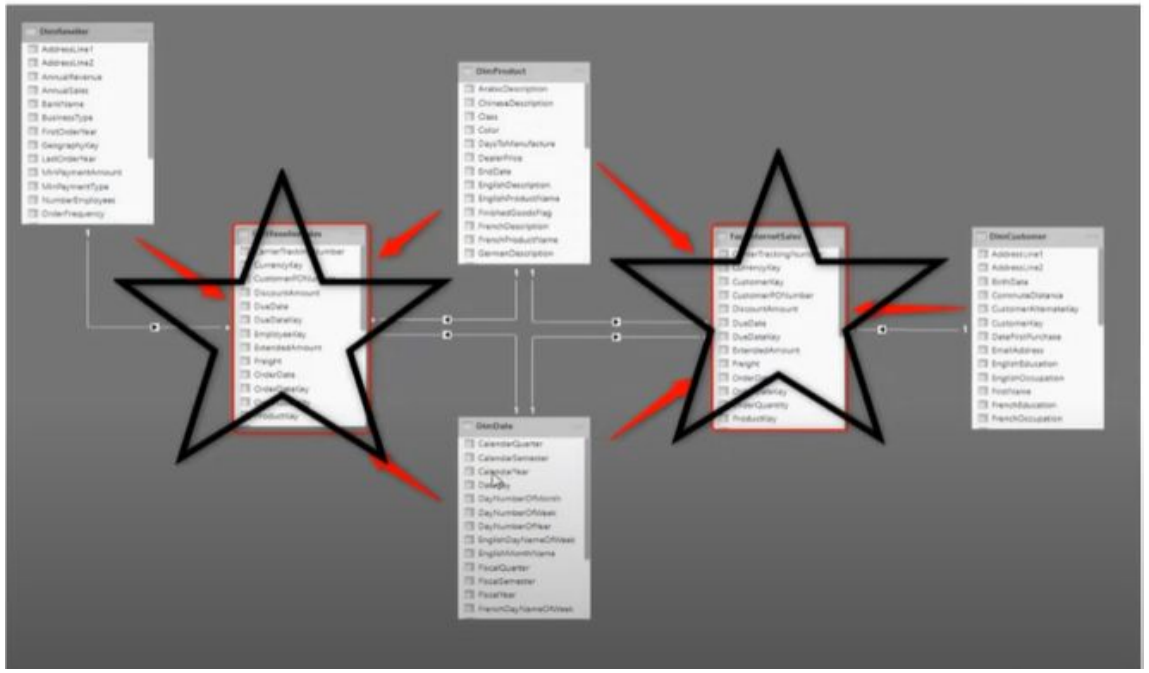
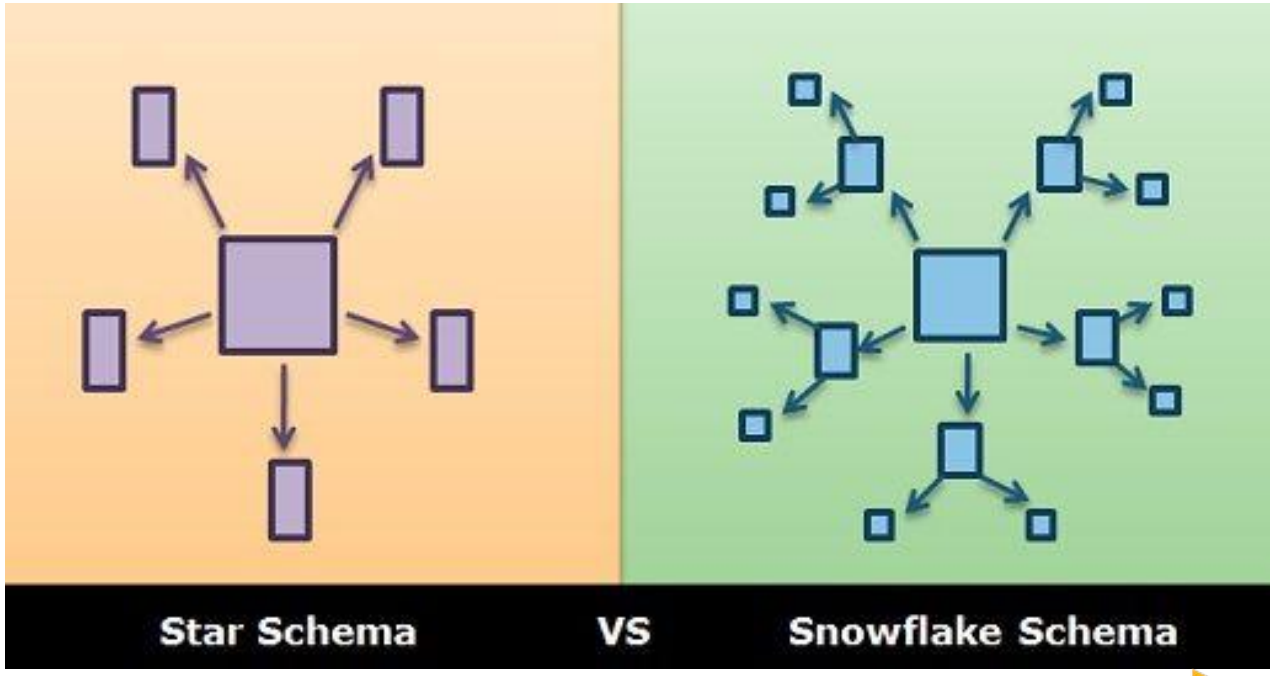
Designing a Data Model

Star Schema is not just one fact table !





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Designing a Data Model

How to optimize a data model ?

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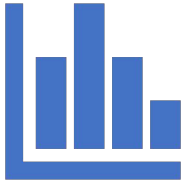

DAX

- Data Expression Language (DAX) is a library of functions and operators that can be combined to build formulas and expressions in Power BI.

- DAX allows you to add new columns and measures to enrich your data sources and open potential for new insights

- 3 ways to use DAX
  - Calculated columns
  - Calculated measures
  - Calculated Tables

- Where DAX can be used ?

  - Power BI
  - Power Pivot for Excel
  - SSAS Tabular Model
  - Azure Analysis Service

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Calculated Columns vs Measures

Calculated Columns	Calculated Measures
Expands table by creating new columns	Summarizes data into a single value
Stored along with tables / Consume storage	Calculated at runtime / Consume RAM
Less analytical capabilities	Rich analytical capabilities
Calculated before aggregation	Calculated after the aggregation

```
New Product =
[Product Item]     & " – " & [Product Category]
```

```
Profit =
[Sales Amount ] -   [Cost Amount ]
```

```
Total Sales = Sum([Sales Amount])
```

```
Total Profit =
Sum( [Sales Amount] ) - Sum( [Cost Amount] )
```

```
Prev Year Sale =
Calculate  ( Sum([Sales Amount] ) ,
            SAMEPERIODLASTYEAR ( 'Sale'[Date] )
           )
```

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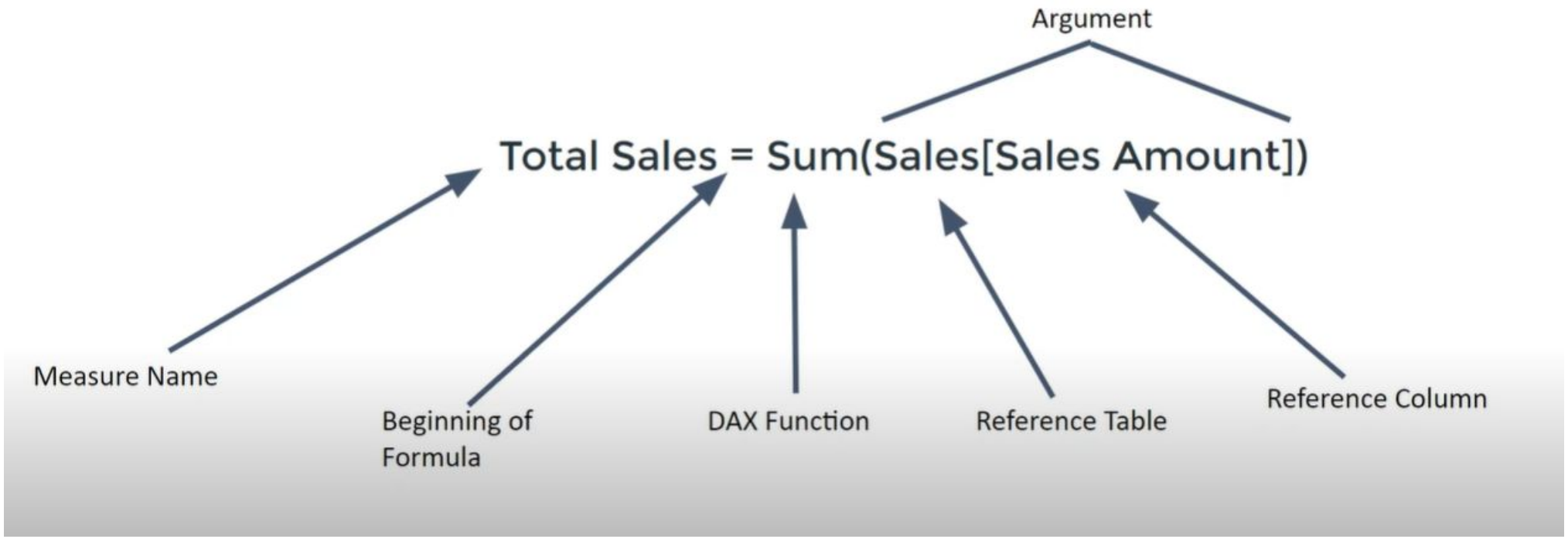
DAX Syntax



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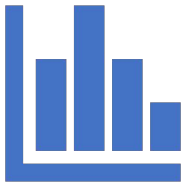

DAX Operators and Data Types

- Text
  - Customer name
  - Age
  - Color
- Whole number , Decimal
  - Quantity
  - Sales
  - Profit
- Date Time , Date , Time
  - Sales Date
  - Birthday
  - TimeUTC
- True / False
  - isValid
  - isTrue
  - Accepted

Operator Type	Symbol	Use	Example
Parenthesis	( )	Precedence order and grouping of arguments	(5 + 2) * 3
Arithmetic	+	Addition	4 + 2
	-	Subtraction/negation	6 - 3
	*	Multiplication	15 * 4
	/	Division	45 / 9
Comparison	=	Equal	[Country] = "USA"
	<>	Not equal to	[Country] <> "USA"
	>	Greater than	[Quantity] > 0
	>=	Greater than or equal to	[Quantity] >= 50
	<	Less than	[Quantity] < 0
	<=	Less than or equal to	[Quantity] <= 50
Text concatenation	&	Concatenation of strings	"Value is" & [Amount]
Logical	&&	AND condition between Boolean expressions	[Country] = "USA" && [Quantity] > 0
	||	OR condition between Boolean expressions	[Country] = "USA" || [Quantity] >0
	!	NOT operator on the Boolean expression that follows	!([Country] = "USA")

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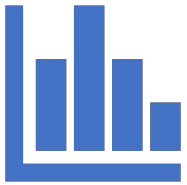

Types of DAX Functions

- Aggregate Functions
- Date and Time Functions
- Time Intelligent Functions
- Filter Functions
- Financial Functions
- Information Functions
- Logical Functions
- Math and Trig Functions
- Other Functions
- Parent and Child Functions
- Relationship Functions
- Statistical Functions
- Table Manipulation Functions
- Text Functions

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Aggregate Functions – SUM vs SUMX

SUM , SUMX

- SUMX - Returns the sum of an expression evacuated for each row in a table
- SUM - Adds all the numbers in a column. Does not require row by row operation

What is CALCULATE function ?

CALCULATE , ALL

- Compare total sales with main branch (united sales) sales ?
- How much % each location is contributing to my sales ?

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Time Intelligent Functions

TOTALMTD, TOTALQTD, TOTALYTD

- What is cumulative sales quantity over Month, Quarter, Year ?
- What is Financial Year cumulative sales quantity ?

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Time Intelligent Functions

SAMEPERIODLASTYEAR

Returns a table that contains a column of dates shifted one year back in time from the dates in the specified dates column, in the current context.

- How is my current year sales performing over last year ?

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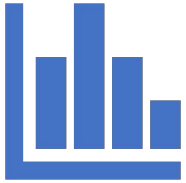

Time Intelligent Functions

PREVIOUSMONTH, PREVIOUSYEAR, PREVIOUSDAY, PREVIOUSQUARTER

- How my sales performing comparing to last month ?
- How my sales performing comparing to last year ?
- How my sales performing comparing to last day ?
- How my sales performing comparing to last quarter ?

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Time Intelligent Functions

DATEADD

Returns a table that contains a column of dates, shifted either forward or backward in time by the specified number of intervals from the dates in the current context.

- What is my sales compared to 14 days ago ?
- What is my current sales compared to my business started year ?

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Time Intelligent Functions

DATESINPERIOD, LASTDATE

- How to calculate 3 month cumulative / moving average of sales ?
- How to calculate 6 month cumulative / moving average of sales ?

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Filter Functions

ALL , ALLEXCEPT

- Creating a reference table
- How much each category is contributing to total sales ?
- How much each category is contributing to total sales for each country ?

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Filter Functions

CALCULATE

- Compare total sales with main branch (united sales) sales ?
- How much % each location is contributing to my sales ?

Filter Functions

LOOKUPVALUE

- Compare my product prices with competitor prices ?

Filter Functions

SELECTEDVALUE

- Display monthly sales which allows to see all sales figures that occurred before a selected month ?

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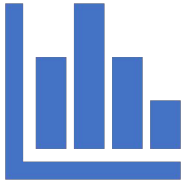
Logical Functions

IF , NESTEDIF, SWITCH

Logical functions can be used to check the result of an expression and create conditional results



Relationship Functions

CROSSFILTER , USERRELATIONSHIP

Used to manage and utilize relationships between tables

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