Logical functions

DAX IN POWER BI

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Overview of logical functions

Logical functions act upon an expression to return information about the values or sets in the expression.

The most used logical functions are:

- `IF()`
- `AND(), OR(), NOT()`
- `SWITCH()`

IF() is one of the most commonly used logic functions

Structure:

- `IF(<logical_test>, <value_if_true>[, <value_if_false>])`

Example:

- `Performance = IF([Total Sales] >= 50 000, "Target Reached", "Target Not Reached")`

IF() is one of the most commonly used logic functions

Structure:

- `IF(<logical_test>, <value_if_true>[, <value_if_false>])`

Example:

- `Performance = IF([Total Sales] >= 50 000, "Target Reached", "Target Not Reached")`

Name	Total Sales
Jenny	48,431
Jane	76,528
Dwayne	24,167
Thomas	52,125

IF() is one of the most commonly used logic functions

Structure:

- `IF(<logical_test>, <value_if_true>[, <value_if_false>])`

Example:

- `Performance = IF([Total_Sales] >= 50 000, "Target Reached", "Target Not Reached")`

Name	Total Sales	Performance
Jenny	48,431	Target not Reached
Jane	76,528	Target Reached
Dwayne	24,167	Target Not Reached
Thomas	52,125	Target Reached

AND(), OR() & NOT() operators

All three operators return `TRUE` or `FALSE` as the output.

- `AND(<logical1>,<logical2>)`
  - Returns `TRUE` if both conditions are `TRUE`
  - *Example:* `AND(5 < 4, 5 < 6) = AND(FALSE, TRUE) = FALSE`
- `OR(<logical1>,<logical2>)`
  - Returns `TRUE` if at least one condition is `TRUE`
  - *Example:* `OR(5 < 4, 5 < 6) = OR(FALSE, TRUE) = TRUE`
- `NOT(<logical>)`
  - Changes `TRUE` to `FALSE` and vice versa
  - *Example:* `NOT(OR(5 < 4, 5 < 6)) = NOT(TRUE) = FALSE`

AND(), OR() & NOT() operators

`AND` can be replaced by `&&`

- `AND(5 < 4, 5 < 6)` = `5 < 4 && 5 < 6`

`OR` can be replaced by `||`

- `OR(5 < 4, 5 < 6)` = `5 < 4 || 5 < 6`

The power of SWITCH()

Evaluates an expression against a list of values and returns one of multiple possible result expressions.

- `SWITCH(<expression>, <value>, <result>[, <value>, <result>] ... [, <else>])`
- Often preferred over nested `IF()` functions

```
Performance = SWITCH(TRUE,
[Total_Sales] < 25 000, "Poor",
[Total_Sales] < 50 000, "Below expectations",
[Total_Sales] < 75 000, "Above expectations",
"Exceptional")
```

The power of SWITCH()

```
Performance = SWITCH(TRUE,
[Total_Sales] < 25 000, "Poor",
[Total_Sales] < 50 000, "Below expectations",
[Total_Sales] < 75 000, "Above expectations",
 "Exceptional")
```

Name	Total Sales
Jenny	48,431
Jane	76,528
Dwayne	24,167
Thomas	52,125

The power of SWITCH()

```
Performance = SWITCH(TRUE,
[Total_Sales] < 25 000, "Poor",
[Total_Sales] < 50 000, "Below expectations",
[Total_Sales] < 75 000, "Above expectations",
 "Exceptional")
```

Name	Total Sales	Performance
Jenny	48,431	Below Expectations
Jane	76,528	Exceptional
Dwayne	24,167	Poor
Thomas	52,125	Above expectations

The power of SWITCH()

```
DISCOUNT = SWITCH([Clothing Type],
                  "T-shirt", 0.15,
                  "Pants", 0.20,
                  "Belts", 0.30,
                  "Shoes", 0.25)
```

Clothing Type
T-shirt
Pants
Belt
Shoes

The power of SWITCH()

```
DISCOUNT = SWITCH([Clothing Type],
                  "T-shirt", 0.15,
                  "Pants", 0.20,
                  "Belts", 0.30,
                  "Shoes", 0.25)
```

Clothing Type	Discount
T-shirt	15%
Pants	20%
Belt	30%
Shoes	25%

Let's switch it up!

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Let's practice!

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Row-level security

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What is row-level security?

Row-level security (RLS) in Power BI can be used to restrict data access for given users:

- Way to restrict data access for the logged in user
- You can define roles and rules with Power BI desktop
- A dashboard could look completely different depending on the person accessing it

What is row-level security?

Row-Level Security (RLS) uses filters to restrict data at the row level

Name	Total Sales	Region
Jenny	48,431	East
Jane	76,528	West
Dwayne	24,167	West
Thomas	52,125	East

```
Region = East
```

What is row-level security?

Row-Level Security (RLS) uses filters to restrict data at the row level

Name	Total Sales	Region
Jenny	48,431	East
Jane	76,528	West
Dwayne	24,167	West
Thomas	52,125	East

```
Region = East
```

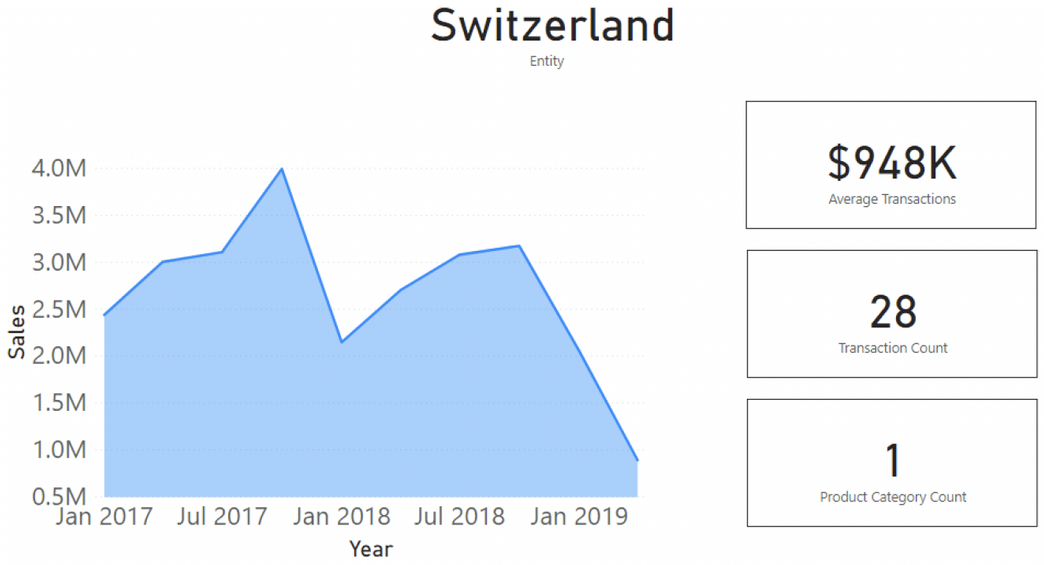
Name	Total Sales	Region
Jenny	48,431	East
Thomas	52,125	East

Use cases of row-level security in Power BI

- Row-level security has multiple use cases:
  - User access requirements based on role (such as sales)
  - Restricting access requirements for a specific user or group of users
  - User wants specific/filtered data presented (such as a customer)

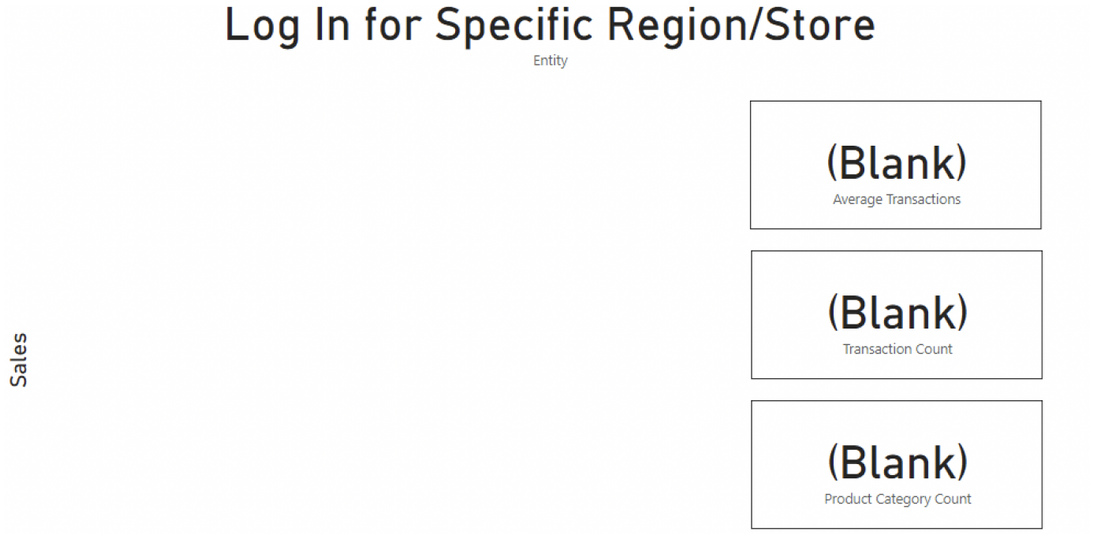
Use cases of row-level security in Power BI

- Row-Level Security has multiple use cases:
  - **User access requirements based on role (such as sales)**
  - Restricting access requirements for a specific user
  - User wants specific/filtered data presented (such as a customer)
- Switzerland Sales dashboard



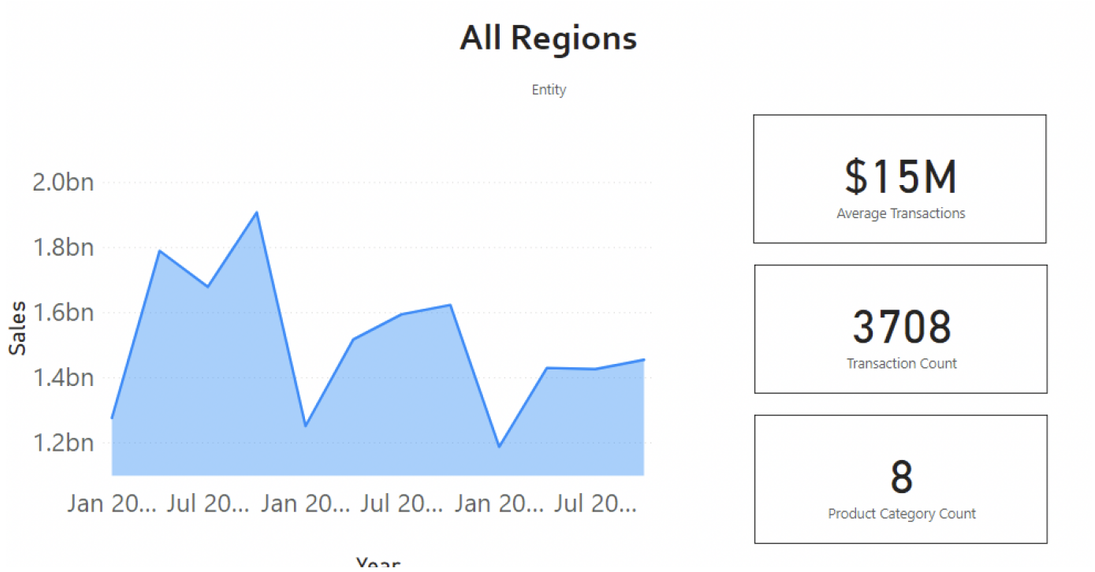
Use cases of row-level security in Power BI

- Row-Level Security has multiple use cases:
  - User access requirements based on role (such as sales)
  - **Restricting access requirements for a specific user or group of users**
  - User wants specific/filtered data presented (such as a customer)
- Non sales dashboard



Use cases of row-level security in Power BI

- Row-Level Security has multiple use cases:
  - User access requirements based on role (such as sales)
  - Restricting access requirements for a specific user or group of users
  - **User wants specific/filtered data presented (such as a customer)**
- General Manager



DAX and row-level security

Row-level security utilizes DAX to:

- Provide filtered values at a row level
- Filter on fact or dimension tables
- *Example:* `[Is Salesperson] = True`

Dynamic row-level security

Ensures users only see the information appropriate for their roles

DAX has two main functions to enable this:

- `USERPRINCIPALNAME()`
  - Returns the user principal name (UPN), which is equal to the email address
  - Gives the same result in Power BI Desktop and Power BI Service
  - Preferred method
- `USERNAME()`
  - Alternative method to enable RLS with its own use cases
  - Outside the scope of this course

You can use these functions to create **personalized dashboards!**

Let's secure it!

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Managed roles in Power BI

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Let's practice!

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