Filtering and counting with DAX

DAX IN POWER BI

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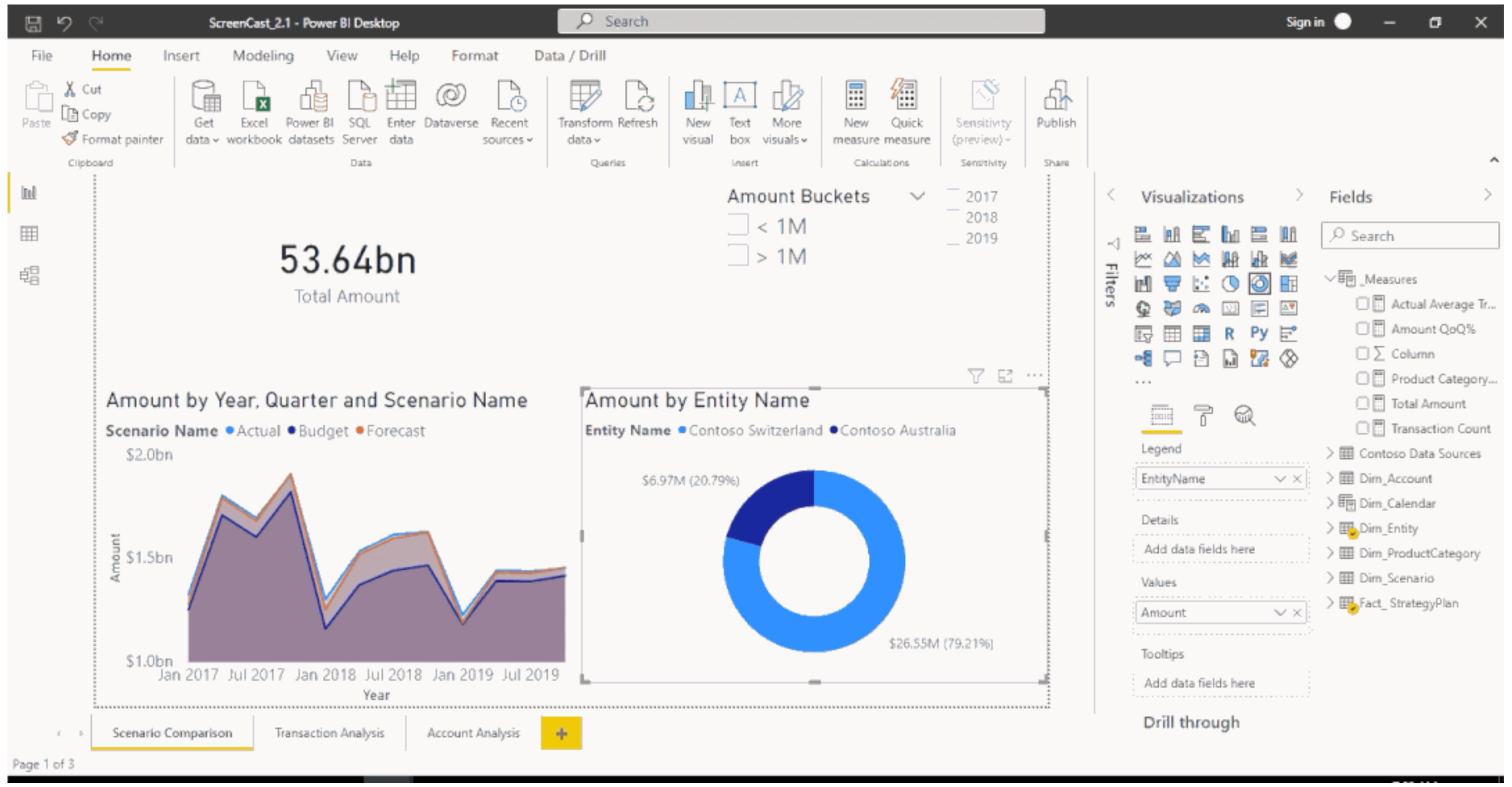
Filter functions

- Filters are applied on the filter context
- Filters take precedence over any visual

```
Total Sales = SUM(Orders[Sales])
```



Filter functions

- Filters are applied on the filter context
- Filters take precedence over any visual

```
Total Sales = SUM(Orders[Sales])
```

```
CALCULATE(<expression>,
            <filter1> , [<filter2> [, ...]])
```

- Used with intermediate functions

```
Total Sales ALL = CALCULATE(
                    [Total Sales],
                    ALL(Orders))
```

Region	**Total Sales**
Central	$501,239.89
East	$678,781.24
South	$391,721.91
West	$725,457.82
TOTAL	**$2,297,200.86**

Filter functions

- Filters are applied on the filter context
- Filters take precedence over any visual

```
Total Sales = SUM(Orders[Sales])
```

```
CALCULATE(<expression>,
            <filter1> , [<filter2> [, ...]])
```

- Used with intermediate functions

```
Total Sales ALL = CALCULATE(
                    [Total Sales],
                    ALL(Orders))
```

Region	Total Sales	Total Sales ALL
Central	$501,239.89	$2,297,200.86
East	$678,781.24	$2,297,200.86
South	$391,721.91	$2,297,200.86
West	$725,457.82	$2,297,200.86
TOTAL	**$2,297,200.86**	**$2,297,200.86**

More filter options

- `FILTER(<table>, <filter>)`
    - *Returns a filtered table*

```
Total Sales Chuck =
CALCULATE(
    [Total Sales],
    FILTER(Fact_Orders,
        RELATED(Dim_Sales[Salesperson]) = "Chuck"))
```

More filter options

- `FILTER(<table>, <filter>)`
  - *Returns a filtered table*

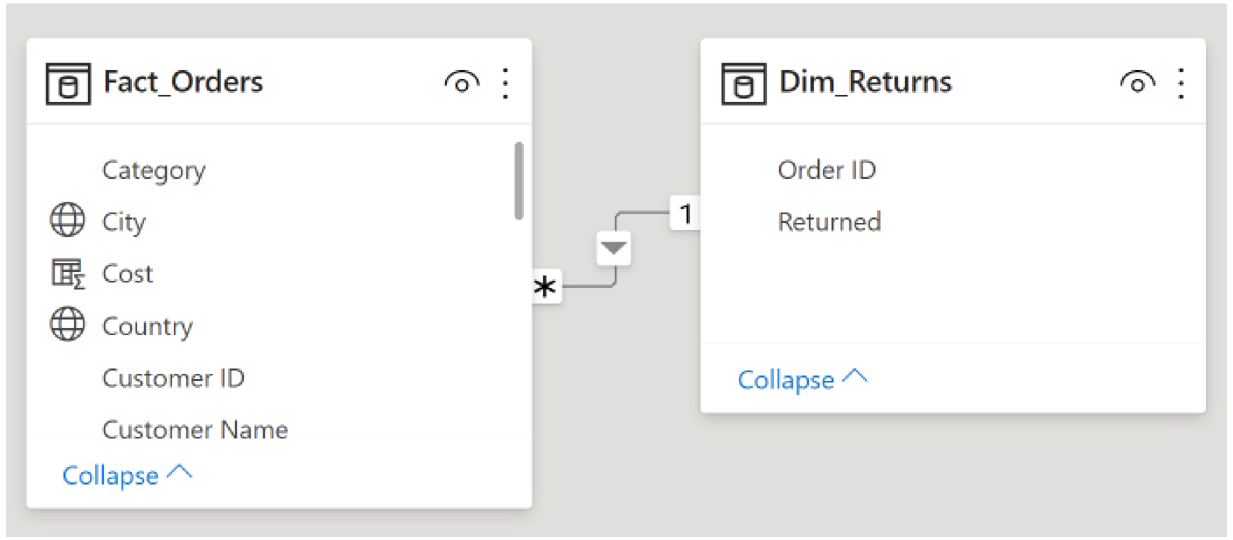
```
Total Sales Chuck =
CALCULATE(
    [Total Sales],
    FILTER(Fact_Orders,
        RELATED(Dim_Sales[Salesperson]) = "Chuck"))
```

Total Sales	Total Sales Chuck
$2,297,200.86	$235,856.05

- `RELATED()` is used to return values from another table

More filter options

- `CROSSFILTER(<col1>, <col2>, <direction>)`
  - *Specifies the cross-filtering direction between two columns*



```
CROSSFILTER(Dim_Returns[Order ID],
            Fact_Orders[Order ID],
            Both)
```

- Overrides relationship direction of data model

The benefits of filtering in DAX

- Improves performance
  - Filter out unnecessary data
  - Define specific relationships between tables
- Reusability
  - Refer to other calculated measures
- More complex computations
  - Concise syntax

Counting

- `COUNT(<column>)`
  - *Returns the amount of rows with numbers, dates, or strings in a column*
- `COUNTA(<column>)`
  - *Returns the amount of rows with numbers, dates, strings, or booleans in a column*
- `COUNTBLANKS(<column>)`
  - *Returns the amount of blank rows*
- `DISTINCTCOUNT(<column>)`
  - *Returns the amount of distinct values in a column*
- `COUNTROWS(<table>)`
  - *Returns the amount of rows with numbers, dates, and strings in a table*

Let's practice!

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Using different filters with DAX

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Let's practice!

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Iterating functions

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Iterating functions

- Iterate over each row of a given table to perform an expression

`SUMX(<table>, <expression>)` `AVERAGEX(<table>, <expression>)`

- X stands for eXpression
- Allow for advanced calculations specified at each row

Iterating functions: SUMX()

Calculated column example

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

```
Total Costs = SUM(Fact_Orders[Cost])
```

Sales	Profit	Cost
$77.88	$3.89	$73.99
$22.72	$10.22	$12.50
...	...	...

Total Costs
$2,569

Iterating functions: SUMX()

Calculated column example

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

```
Total Costs = SUM(Fact_Orders[Cost])
```

Sales	Profit	Cost
$77.88	$3.89	$73.99
$22.72	$10.22	$12.50
...	...	...

Total Costs
$2,569

Iterating function example

```
Total Costs SUMX =
SUMX(Fact_Orders,
     Fact_Orders[Sales] - Fact_Orders[Profit])
```

Total Costs SUMX
$2,569

Filtering iterating functions

- Use filter functions, such as FILTER(), to return a filtered table

```
SUMX(
    FILTER(
        <table>,
        <filter>),
    <expression>)
```

```
Total Costs East SUMX =
SUMX(
    FILTER(
        Fact_Orders,
        Fact_Orders[Region] = "East"),
    Fact_Orders[Sales] - Fact_Orders[Profit])
```

Filtering iterating functions

- Use filter functions, such as FILTER(), to return a filtered table

```
SUMX(
    FILTER(
        <table>,
        <filter>),
    <expression>)
```

```
Total Costs East SUMX =
SUMX(
    FILTER(
        Fact_Orders,
        Fact_Orders[Region] = "East"),
    Fact_Orders[Sales] - Fact_Orders[Profit])
```

Region	Total Costs	Total Costs East SUMX
Central	$501,239.89	
East	$678,781.24	$678,781.24
South	$391,721.91	
West	$725,457.82	
TOTAL	**$2,297,200.86**	**$678,781.24**

Iterating functions: RANKX()

```
RANKX(
    <table>,
    <expression>)
```

- Rank regions by total costs

```
Total Costs RANKX =
RANKX(
    ALL(Dim_Sales[Region]),
    [Total Costs])
```

- Use `ALL()` to evaluate all rows from the dimension table

Iterating functions: RANKX()

```
RANKX(
    <table>,
    <expression>)
```

- Rank regions by total costs

```
Total Costs RANKX =
RANKX(
    ALL(Dim_Sales[Region]),
    [Total Costs])
```

- Use `ALL()` to evaluate all rows from the dimension table

Region	Total Costs	Total Costs RANKX
Central	$725,457.82	1
East	$678,781.24	2
South	$501,239.89	3
West	$391,721.91	4

Operators in DAX

COMPARISON OPERATORS

Operator	Meaning
=	Equal to
==	Strict equal to
>	Greater than
<	Smaller than
>=	Greater than or equal to
<=	Smaller than or equal to
<>	Not equal to

Operators in DAX

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TEXT OPERATOR

Operator	Meaning	Example
&	Concatenates text values	[City]&", "& [State]

Operators in DAX

COMPARISON OPERATORS

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TEXT OPERATOR

Operator	Meaning	Example
&	Concatenates text values	[City]&", "& [State]

LOGICAL OPERATORS

Operator	Meaning	Example
&&	`AND` condition	([City] = "Bru") && ([Return] = "Yes"))
||	`OR` condition	([City] = "Bru") || ([Return] = "Yes"))
IN { }	`OR` condition for each row	Product[Color] IN {"Red", "Blue", "Gold"}

Lesson[Knowledge] IN {"Poor", "Great", "Awesome!"}

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Iterating functions in Power BI

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Full Name
Instructor

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Let's practice!

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