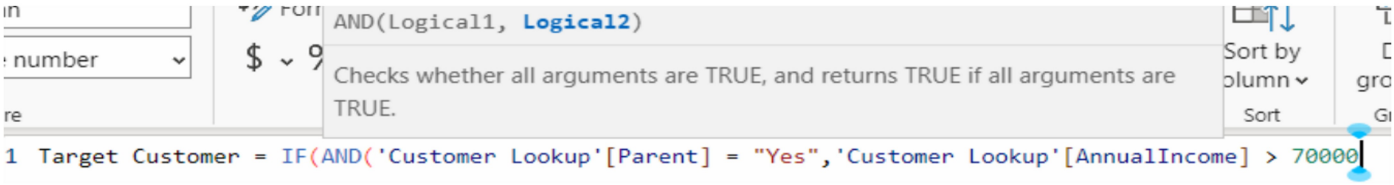
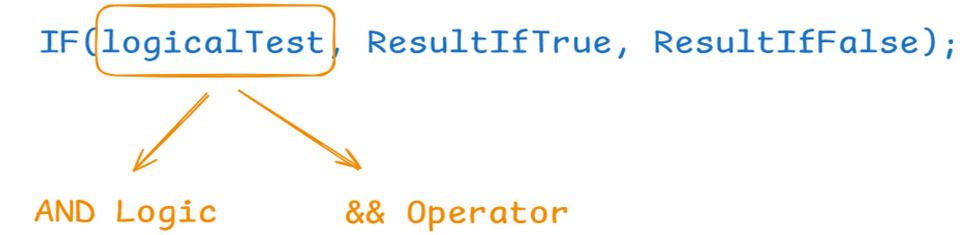
## Power BI - DAX - p2 - Lecture 16

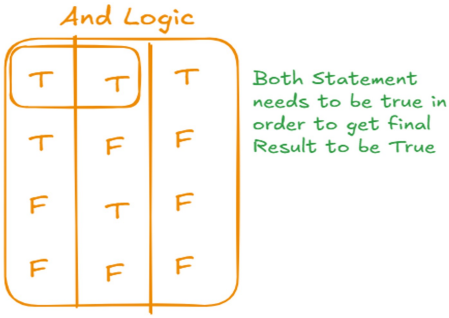



And Logic will help you to write 2 logical Expression to verify the statement and return the result.

**&& Operator**

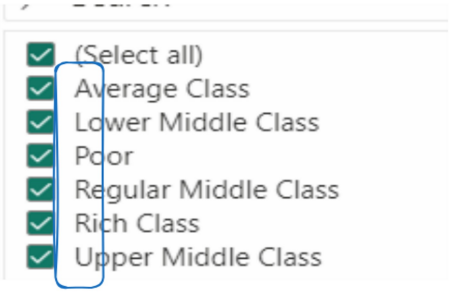
```
Target Customer = IF(('Customer Lookup'[Parent] ="Yes" && 'Customer Lookup'[AnnualIncome] > 70000 && 'Customer Lookup'[MaritalStatus] = "M" && 'Customer Lookup'[Gender] = "M"),"Eligible","Not Eligible")
```




```
Target Customer 2 = IF(AND('Customer Lookup'[Parent] = "Yes", 'Customer Lookup'[AnnualIncome] > 100000),"Eligible", "Not Eligible")
```

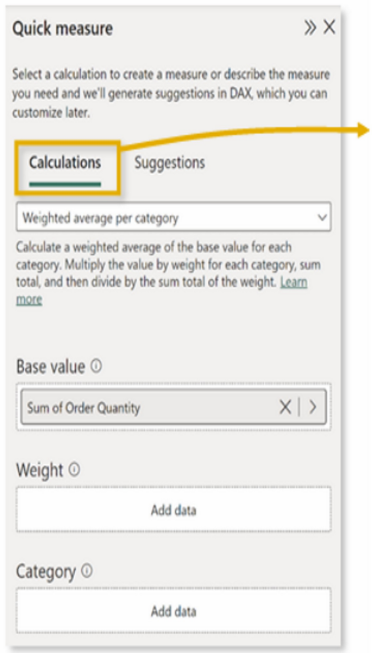
Income > 150000 - "Rich Class",
Income > 120000 - "Upper Middle Class",
Income > 100000 - "Regular Middle Class",
Income > 700000 - "Lower Middle Class",
Income > 400000 - "Average Class",
Else - Poor



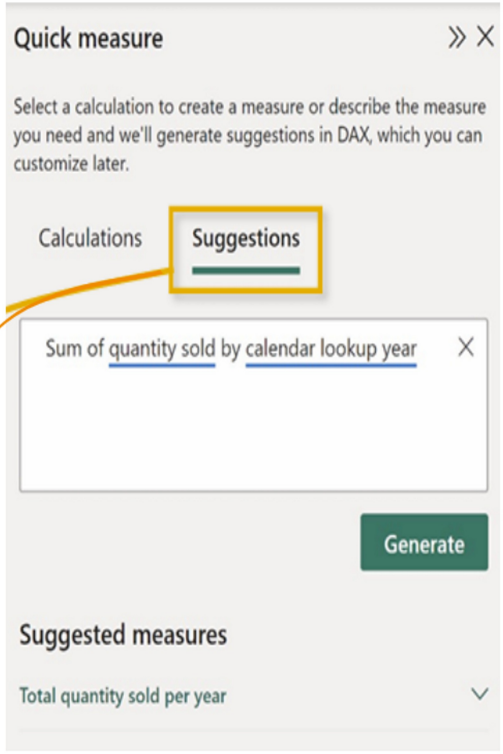

```
Financial Status = IF('Customer Lookup'[AnnualIncome] >= 150000 , "Rich Class",
                    IF('Customer Lookup'[AnnualIncome] >= 120000, "Upper Middle Class",
                        IF('Customer Lookup'[AnnualIncome] >= 100000 , "Regular Middle Class",
                            IF('Customer Lookup'[AnnualIncome] >= 70000 , "Lower Middle Class",
                                IF('Customer Lookup'[AnnualIncome] >= 40000, "Average Class" , "Poor")))))
```

# QUICK MEASURES

Quick measures automatically create formulas based on pre-built templates or natural language prompts




Quick measure calculations can be used to build measures using predefined templates (weighted averages, percent difference, time intelligence, etc.)



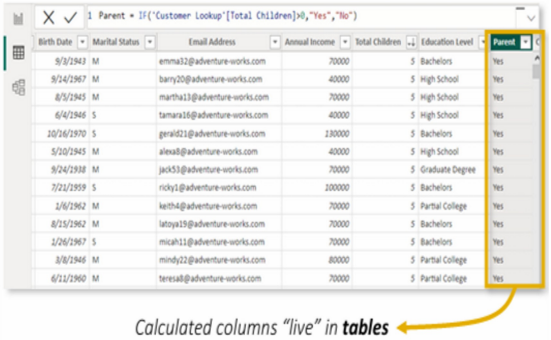

Quick measure suggestions can be used to find suggested measures based on natural language queries (i.e. "sum of quantity sold by calendar year")

PRO TIP:
Quick measures can be a great learning tool for beginners or for building more complex formulas but use them with caution; mastering DAX requires a deep understanding of the underlying theory!

# RECAP: CALCULATED COLUMNS VS. MEASURES

## CALCULATED COLUMNS

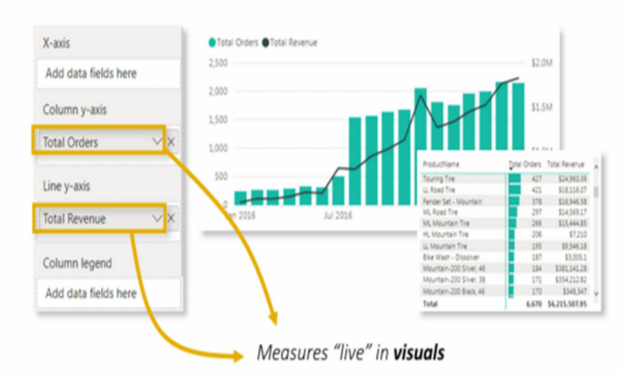
- Values are calculated based on information from each row of a table (row context)
- Appends static values to each row in a table and stores them in the model (which increases file size)
- Recalculate on data source refresh or when changes are made to component columns
- Primarily used for filtering data in reports




*Calculated columns "live" in **tables***

## MEASURES

- Values are calculated based on information from any filters in the report (filter context)
- Does not create new data in the tables themselves (doesn't increase file size)
- Recalculate in response to any change to filters within the report
- Primarily used for aggregating values in report visuals

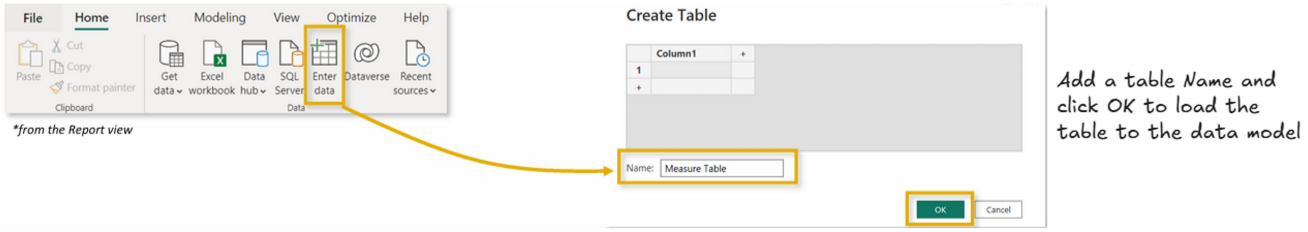



*Measures "live" in **visuals***

## PRO TIP: MEASURE TABLES

It's a common best practice to create a dedicated table to store your measures; this will help you stay organized, find measures quickly, and allow you to group related measures into folders.

### Option 1: Enter Data into Power Query (loads the table to the data model – table is visible in Power Query)




Add a table Name and click OK to load the table to the data model

### Option 2: Create a calculated table using DAX directly in the model (table is not visible in Power Query)


Create new table & use a table constructor { } to add a single column

## FILTER CONTEXT

Measures are evaluated based on filter context, which means that they recalculate whenever the fields or filters around them change

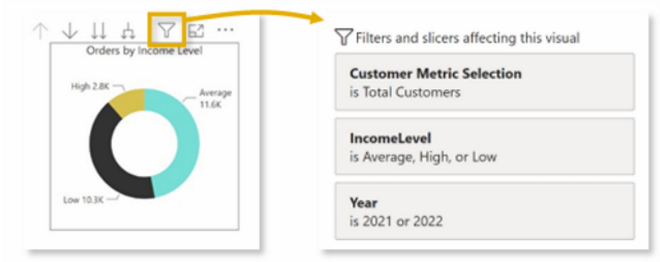
| Top 10 Products | Orders | Revenue | Return % |
|---|---|---|---|
| Water Bottle - 30 oz. | 3,983 | $39,755 | 1.95% |
| Patch Kit/8 Patches | 2,952 | $13,506 | 1.61% |
| Mountain Tire Tube | 2,846 | $28,333 | 1.64% |
| Road Tire Tube | 2,173 | $17,265 | 1.55% |
| Sport-100 Helmet, Red | 2,099 | $73,444 | 3.33% |
| AWC Logo Cap | 2,062 | $35,865 | 1.11% |
| Sport-100 Helmet, Blue | 1,995 | $67,112 | 3.31% |
| Fender Set - Mountain | 1,975 | $87,041 | 1.36% |
| Sport-100 Helmet, Black | 1,940 | $65,262 | 2.68% |
| Mountain Bottle Cage | 1,896 | $38,062 | 2.02% |
| **Total** | **15,587** | **$465,644** | **1.85%** |

For this value in the matrix (2,846), the Orders measure is calculated based on the following filter context: Products[Product Name] = "Mountain Tire Tube"

- This allows the measure to return the total order quantity for each product specifically (or whatever context the row and column labels dictate – years, countries, categories, customer names, etc.)

This total (15,587) does NOT calculate by summing the values above; it evaluates as an independent measure with no filter context applied

- IMPORTANT: Every measure value in a report evaluates independently (like an island) and calculates based on its own filter context




PRO TIP: Clicking the filter icon will show you the filters currently applied to a selected visual

## EXAMPLE: FILTER CONTEXT

**MEASURE**: Revenue Per Customer

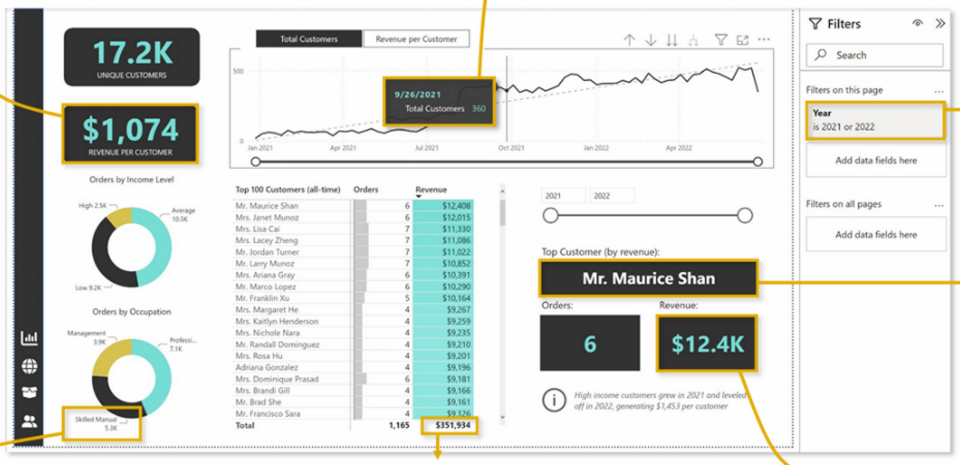
**FILTER CONTEXT**:

- *Calendar[**Year**]* = 2021 *or* 2022

**MEASURE**: Total Customers

**FILTER CONTEXT**:

- *Calendar[**Date**]* = September 26, 2021




This is **a page-level filter**, which impacts **ALL** visuals on this report page *(more on this later!)*

**COLUMN**: Customer Full Name

**FILTER CONTEXT:**

- *Calendar[**Year**]* = 2021 *or* 2022
- *Customer[**Full Name**]* = Top 1 by Total Revenue

**MEASURE**: Total Orders

**FILTER CONTEXT**:

- *Calendar[**Year**]* = 2021 *or* 2022
- *Customers[**Occupation**]* = Skilled Manual

**MEASURE**: Total Revenue

**FILTER CONTEXT**:

- *Calendar[**Year**]* = 2021 *or* 2022
- *Customer[**Full Name**]* = Top 100 by Total Orders

**MEASURE**: Total Revenue

**FILTER CONTEXT:**

- *Calendar[**Year**]* = 2021 *or* 2022
- *Customer[**Full Name**]* = Mr. Maurice Shan

## STEP-BY-STEP MEASURE CALCULATION

| Product Color | Quantity Sold |
|---|---|
| Black | 10,590 |
| Red | 4,011 |
| Yellow | 4,638 |

How exactly is this measure value calculated?

- NOTE: This all happens instantly behind the scenes, every time the filter context changes

## STEP 1

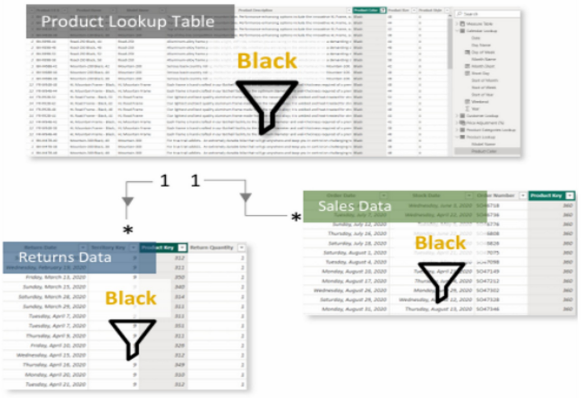
**Filter context is detected & applied**

| Product Color | Quantity Sold |
|---|---|
| Black | 10,590 |
| Red | 4,011 |
| Yellow | 4,638 |

'Product Lookup'[Product Color] = "Black"


## STEP 2

**Filters flow "downstream" to related tables**




## STEP 3

**Measure evaluates against the filtered table**

```
1  Quantity Sold =
2  SUM(
3      'Sales Data'[Order Quantity]
4  )
```

*Sum of values in the **Order Quantity** column of the **Sales Data** table, filtered to rows where the product color is "**Black**"*

**= 10,590**