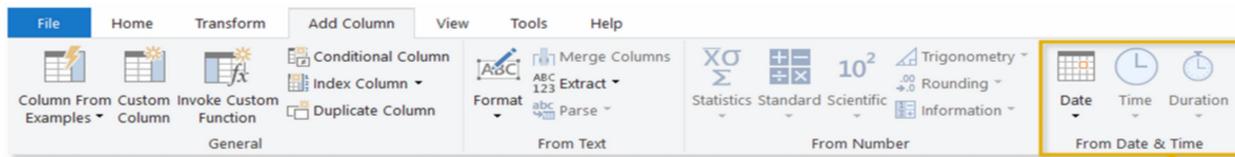


# Power BI - Data Transformation - Advance Transforming - Lecture 7

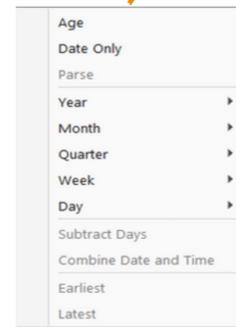
## Power BI - Data Transformation - p5

### DATE & TIME TOOLS



Date & Time tools are relatively straight-forward, and include the following options:

- Age: Difference between the current date and the date in each row
- Date Only: Removes the time component from a date/time field
- Year/Month/Quarter/Week/Day: Extracts individual components from a date field (time specific options include Hour, Minute, Second, etc.)
- Earliest/Latest: Evaluates the earliest or latest date from a column as a single value (can only be accessed from the "Transform" menu)

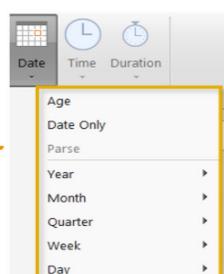


Note: You will almost always want to perform these operations from the "Add Column" menu to build out new fields, rather than transforming an individual date/time column

**PRO TIP:** Load up a table containing a single date column and use Date tools to build out an entire calendar table

### CREATING A CALENDAR TABLE

|    | Date      |
|----|-----------|
| 1  | 1/1/2020  |
| 2  | 1/2/2020  |
| 3  | 1/3/2020  |
| 4  | 1/4/2020  |
| 5  | 1/5/2020  |
| 6  | 1/6/2020  |
| 7  | 1/7/2020  |
| 8  | 1/8/2020  |
| 9  | 1/9/2020  |
| 10 | 1/10/2020 |
| 11 | 1/11/2020 |
| 12 | 1/12/2020 |
| 13 | 1/13/2020 |
| 14 | 1/14/2020 |
| 15 | 1/15/2020 |
| 16 | 1/16/2020 |
| 17 | 1/17/2020 |
| 18 | 1/18/2020 |
| 19 | 1/19/2020 |
| 20 | 1/20/2020 |
| 21 | 1/21/2020 |
| 22 | 1/22/2020 |
| 23 | 1/23/2020 |
| 24 | 1/24/2020 |
| 25 | 1/25/2020 |
| 26 | 1/26/2020 |
| 27 | 1/27/2020 |
| 28 | 1/28/2020 |



Use the Date options in the Add Column menu to quickly build out an entire calendar table from a list of dates

|    | Date      | Day Name  | Start of Week | Start of Month | Month Name |
|----|-----------|-----------|---------------|----------------|------------|
| 1  | 1/1/2020  | Wednesday | 12/29/2019    | 1/1/2020       | January    |
| 2  | 1/2/2020  | Thursday  | 12/29/2019    | 1/1/2020       | January    |
| 3  | 1/3/2020  | Friday    | 12/29/2019    | 1/1/2020       | January    |
| 4  | 1/4/2020  | Saturday  | 12/29/2019    | 1/1/2020       | January    |
| 5  | 1/5/2020  | Sunday    | 1/5/2020      | 1/1/2020       | January    |
| 6  | 1/6/2020  | Monday    | 1/5/2020      | 1/1/2020       | January    |
| 7  | 1/7/2020  | Tuesday   | 1/5/2020      | 1/1/2020       | January    |
| 8  | 1/8/2020  | Wednesday | 1/5/2020      | 1/1/2020       | January    |
| 9  | 1/9/2020  | Thursday  | 1/5/2020      | 1/1/2020       | January    |
| 10 | 1/10/2020 | Friday    | 1/5/2020      | 1/1/2020       | January    |
| 11 | 1/11/2020 | Saturday  | 1/5/2020      | 1/1/2020       | January    |
| 12 | 1/12/2020 | Sunday    | 1/12/2020     | 1/1/2020       | January    |
| 13 | 1/13/2020 | Monday    | 1/12/2020     | 1/1/2020       | January    |
| 14 | 1/14/2020 | Tuesday   | 1/12/2020     | 1/1/2020       | January    |
| 15 | 1/15/2020 | Wednesday | 1/12/2020     | 1/1/2020       | January    |
| 16 | 1/16/2020 | Thursday  | 1/12/2020     | 1/1/2020       | January    |
| 17 | 1/17/2020 | Friday    | 1/12/2020     | 1/1/2020       | January    |
| 18 | 1/18/2020 | Saturday  | 1/12/2020     | 1/1/2020       | January    |
| 19 | 1/19/2020 | Sunday    | 1/19/2020     | 1/1/2020       | January    |
| 20 | 1/20/2020 | Monday    | 1/19/2020     | 1/1/2020       | January    |
| 21 | 1/21/2020 | Tuesday   | 1/19/2020     | 1/1/2020       | January    |
| 22 | 1/22/2020 | Wednesday | 1/19/2020     | 1/1/2020       | January    |
| 23 | 1/23/2020 | Thursday  | 1/19/2020     | 1/1/2020       | January    |
| 24 | 1/24/2020 | Friday    | 1/19/2020     | 1/1/2020       | January    |
| 25 | 1/25/2020 | Saturday  | 1/19/2020     | 1/1/2020       | January    |
| 26 | 1/26/2020 | Sunday    | 1/26/2020     | 1/1/2020       | January    |
| 27 | 1/27/2020 | Monday    | 1/26/2020     | 1/1/2020       | January    |
| 28 | 1/28/2020 | Tuesday   | 1/26/2020     | 1/1/2020       | January    |

(DATE TIME) - TIMESTAMP - TODAY(), NOW()..... SQL

2024 year-12 month-11 day—9 hour:30 min:25 sec

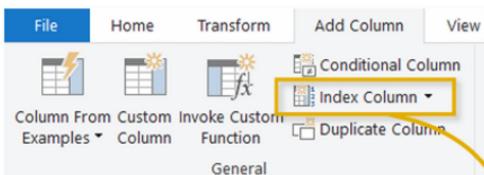
The screenshot shows the Power BI Data Editor interface. At the top, there's a ribbon with 'Add Column', 'View', 'Tools', and 'Help'. Below the ribbon are various data transformation tools: 'Conditional Column', 'Index Column', 'Duplicate Column', 'Merge Columns', 'Format', 'Parse', 'From Text', 'From Number', 'Trigonometry', 'Rounding', 'Information', 'From Date & Time', 'Text Analytics', 'Vision', 'Azure Machine Learning', and 'AI Insights'. A blue oval highlights the 'Add Column' button. A blue box highlights the 'From Date & Time' button. In the main area, there's a table with two columns: 'Date' and 'Day Name'. The 'Date' column has four rows: 01-01-2020, 02-01-2020, 03-01-2020, and 04-01-2020. The 'Day Name' column also has four rows: Wednesday, Thursday, Friday, and Saturday. Below the table, there are summary statistics: '912 distinct, 912 unique' for the Date column and '7 distinct, 0 unique' for the Day Name column. There are also three status indicators: 'Valid' (100%), 'Error' (0%), and 'Empty' (0%).

## ASSIGNMENT: CALENDAR TABLES

Add the following columns to the calendar table:

1. Month Name (e.g. "January")
2. Month Number (e.g. "1")
3. Start of Year (e.g. "1/1/2020")
4. Year (e.g. "2020")

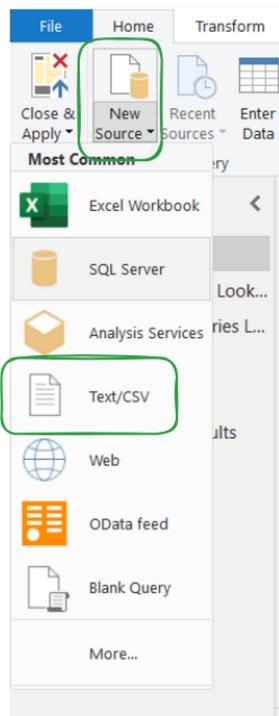
## INDEX COLUMNS



Index Columns contain a list of sequential values that can be used to identify each unique row in a table (typically starting from 0 or 1)

These are often used to create unique IDs that can be used to form relationships between tables (more on that later!)

|    | Order Date | Stock Date | Avg Order Number | Product Key |
|----|------------|------------|------------------|-------------|
| 1  | 1/1/2020   | 9/21/2019  | S045080          | 332         |
| 2  | 1/1/2020   | 12/5/2019  | S045079          | 312         |
| 3  | 1/1/2020   | 10/29/2019 | S045082          | 350         |
| 4  | 1/1/2020   | 11/16/2019 | S045081          | 338         |
| 5  | 1/2/2020   | 12/15/2019 | S045083          | 312         |
| 6  | 1/2/2020   | 10/12/2019 | S045084          | 310         |
| 7  | 1/2/2020   | 12/18/2019 | S045086          | 314         |
| 8  | 1/2/2020   | 10/9/2019  | S045085          | 312         |
| 9  | 1/3/2020   | 10/3/2019  | S045093          | 312         |
| 10 | 1/3/2020   | 9/29/2019  | S045090          | 310         |
| 11 | 1/3/2020   | 12/11/2019 | S045088          | 345         |
| 12 | 1/3/2020   | 10/24/2019 | S045092          | 313         |
| 13 | 1/3/2020   | 12/16/2019 | S045089          | 351         |
| 14 | 1/3/2020   | 10/26/2019 | S045091          | 314         |
| 15 | 1/3/2020   | 9/11/2019  | S045087          | 350         |
| 16 | 1/3/2020   | 9/11/2019  | S045094          | 310         |
| 17 | 1/4/2020   | 10/30/2019 | S045096          | 312         |
| 18 | 1/4/2020   | 10/30/2019 | S045097          | 313         |
| 19 | 1/4/2020   | 9/15/2019  | S045098          | 310         |
| 20 | 1/4/2020   | 12/7/2019  | S045095          | 344         |



Appending :

Sales 2020

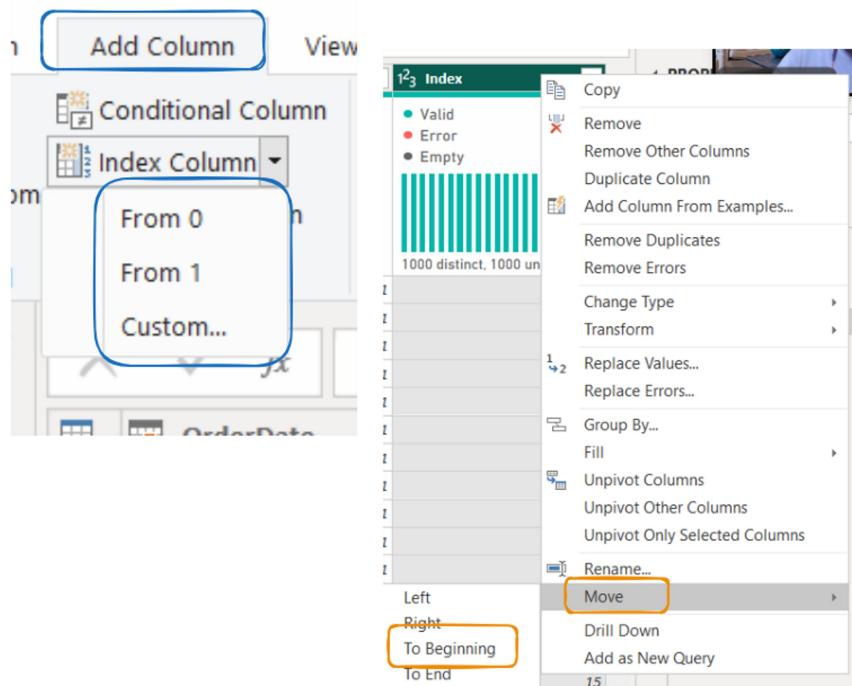
Identical - every column  
should correspond from one  
table to another.  
Order Matters a lot

Sales 2021



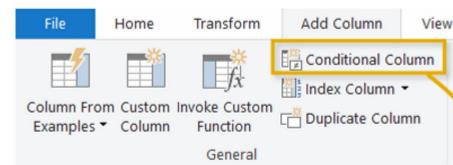
Sales 2022

Sales 2020-22



## CONDITIONAL COLUMNS

Conditional Columns allow you to define new fields based on logical rules and conditions (IF/THEN statements)



Here we're creating a conditional column named Quantity Type, which is based on Order Quantity:

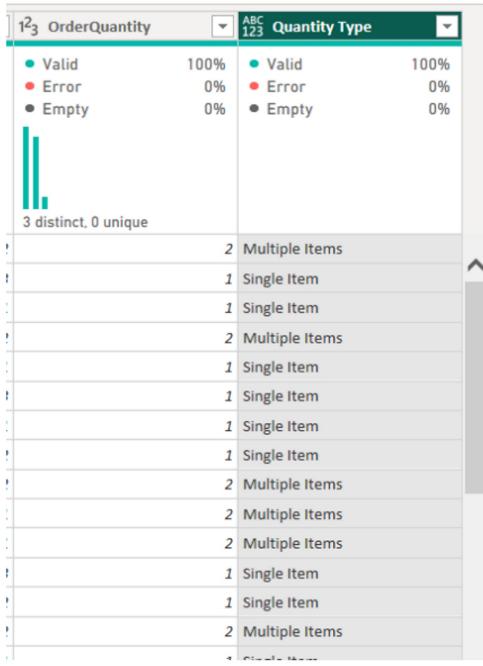
- If Order Quantity = 1, Quantity Type = "Single Item"
- Else If Order Quantity > 1, Quantity Type = "Multiple Items"
- Else, Quantity Type = "Other"

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

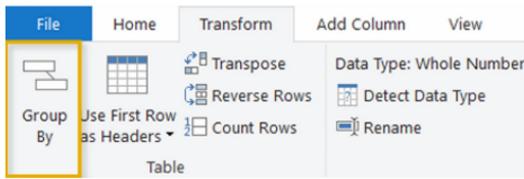
New column name:

| Column Name            | Operator        | Value | Output                      |
|------------------------|-----------------|-------|-----------------------------|
| If Order Quantity      | equals          | ABC 1 | Then ABC Single Item        |
| Else If Order Quantity | is greater than | ABC 1 | Then ABC 123 Multiple Items |
| Add Clause             |                 |       |                             |
| Else ABC Other         |                 |       |                             |



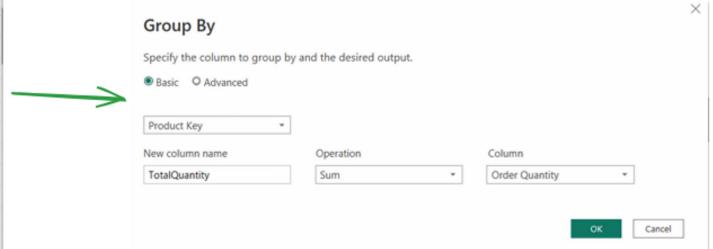
You have to perform it for all 3 Sales Tables. And add this column "Quantity Type" at the end.  
Make sure you give the name correctly.  
Otherwise when we append the table will see multiple filters.

## GROUPING & AGGREGATING



Group By allows you to aggregate data at a different level (i.e. group daily records into monthly, aggregate transactions by store, etc.)

|    | Order Date | Product Key | Customer Key | Order Quantity |
|----|------------|-------------|--------------|----------------|
| 1  | 6/25/2022  | 214         | 14719        | 1              |
| 2  | 10/8/2021  | 214         | 21990        | 1              |
| 3  | 12/30/2021 | 214         | 22098        | 1              |
| 4  | 6/29/2022  | 214         | 22748        | 1              |
| 5  | 8/16/2021  | 214         | 27821        | 1              |
| 6  | 10/9/2021  | 214         | 15685        | 1              |
| 7  | 8/9/2021   | 214         | 14951        | 1              |
| 8  | 1/19/2022  | 214         | 23101        | 1              |
| 9  | 9/23/2021  | 214         | 17158        | 1              |
| 10 | 1/19/2022  | 214         | 24196        | 1              |
| 11 | 6/29/2022  | 214         | 12963        | 1              |
| 12 | 9/13/2021  | 214         | 12715        | 1              |
| 13 | 10/2/2021  | 214         | 14846        | 1              |
| 14 | 7/31/2021  | 214         | 11290        | 1              |
| 15 | 11/24/2021 | 214         | 22103        | 1              |
| 16 | 8/1/2021   | 214         | 16982        | 1              |
| 17 | 10/12/2021 | 214         | 20410        | 1              |
| 18 | 9/10/2021  | 214         | 14217        | 1              |
| 19 | 10/22/2021 | 214         | 19642        | 1              |
| 20 | 8/11/2021  | 214         | 11666        | 1              |



|    | 1.2 Product Key | 1.2 TotalQuantity |
|----|-----------------|-------------------|
| 1  | 214             | 2099              |
| 2  | 215             | 1940              |
| 3  | 220             | 1995              |
| 4  | 223             | 4151              |
| 5  | 226             | 392               |
| 6  | 229             | 408               |
| 7  | 232             | 424               |
| 8  | 235             | 381               |
| 9  | 310             | 169               |
| 10 | 311             | 139               |
| 11 | 312             | 179               |
| 12 | 313             | 168               |
| 13 | 314             | 157               |
| 14 | 320             | 65                |
| 15 | 322             | 39                |
| 16 | 324             | 72                |
| 17 | 326             | 65                |

Here we're transforming a daily, transaction-level table into a summary of Total Quantity by Product Key

NOTE: Any fields not specified in the Group By settings are lost

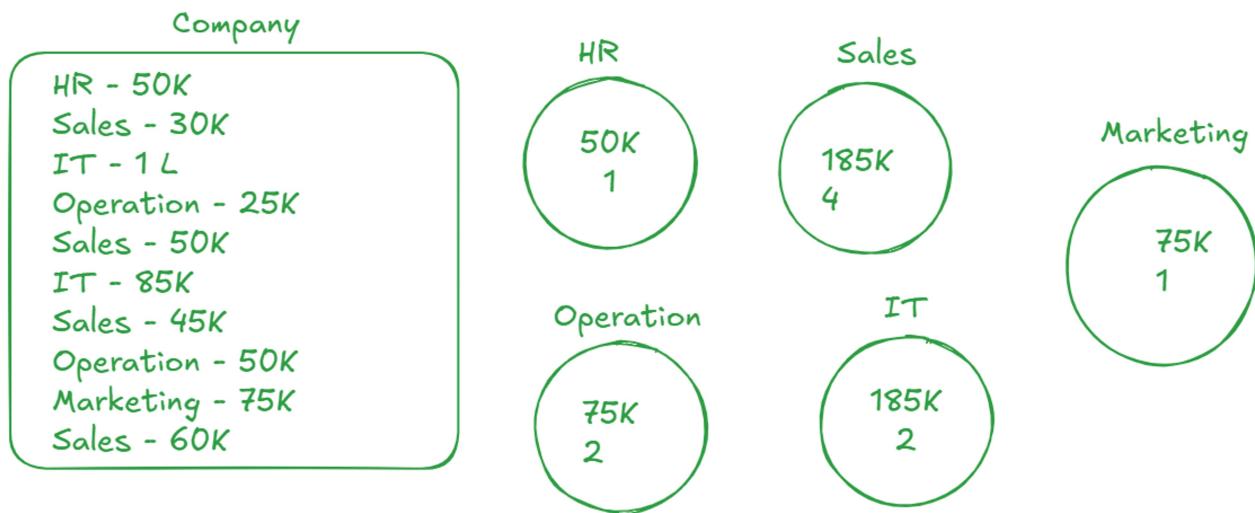
The screenshot shows the Power BI Data Editor interface. On the left is a table of raw transaction data with columns: Order Date, Product Key, Customer Key, and Order Quantity. On the right is a 'Group By' dialog box. The 'Advanced' tab is selected. Under 'Group By' columns, 'Product Key' and 'Customer Key' are chosen. In the 'New column name' section, 'TotalQuantity' is entered. Under 'Operation', 'Sum' is selected for the 'Column' 'Order Quantity'. A green arrow points from the 'Group By' dialog to the 'TotalQuantity' column in the resulting summary table.

|    | Order Date | 1.2 Product Key | 1.2 Customer Key | 1.2 Order Quantity |
|----|------------|-----------------|------------------|--------------------|
| 1  | 6/25/2022  | 214             | 14719            | 1                  |
| 2  | 10/8/2021  | 214             | 21990            | 1                  |
| 3  | 12/30/2021 | 214             | 22098            | 1                  |
| 4  | 6/29/2022  | 214             | 22748            | 1                  |
| 5  | 8/16/2021  | 214             | 27821            | 1                  |
| 6  | 10/9/2021  | 214             | 15685            | 1                  |
| 7  | 8/9/2021   | 214             | 14951            | 1                  |
| 8  | 1/19/2022  | 214             | 23101            | 1                  |
| 9  | 9/23/2021  | 214             | 17158            | 1                  |
| 10 | 1/19/2022  | 214             | 24196            | 1                  |
| 11 | 6/29/2022  | 214             | 12963            | 1                  |
| 12 | 9/13/2021  | 214             | 12715            | 1                  |
| 13 | 10/2/2021  | 214             | 14846            | 1                  |
| 14 | 7/31/2021  | 214             | 11290            | 1                  |
| 15 | 11/24/2021 | 214             | 22103            | 1                  |
| 16 | 8/1/2021   | 214             | 16982            | 1                  |
| 17 | 10/12/2021 | 214             | 20410            | 1                  |
| 18 | 9/10/2021  | 214             | 14217            | 1                  |
| 19 | 10/22/2021 | 214             | 19642            | 1                  |
| 20 | 8/11/2021  | 214             | 11666            | 1                  |

|    | 1.2 Product Key | 1.2 Customer Key | 1.2 TotalQuantity |
|----|-----------------|------------------|-------------------|
| 1  | 214             | 19356            | 1                 |
| 2  | 214             | 15101            | 1                 |
| 3  | 214             | 12473            | 1                 |
| 4  | 214             | 12963            | 1                 |
| 5  | 214             | 26986            | 1                 |
| 6  | 214             | 13202            | 1                 |
| 7  | 214             | 14951            | 1                 |
| 8  | 214             | 11201            | 1                 |
| 9  | 214             | 19538            | 1                 |
| 10 | 214             | 22749            | 1                 |
| 11 | 214             | 15815            | 1                 |
| 12 | 214             | 19252            | 1                 |
| 13 | 214             | 14849            | 1                 |
| 14 | 214             | 11290            | 1                 |
| 15 | 214             | 27851            | 1                 |
| 16 | 214             | 16982            | 1                 |
| 17 | 214             | 21863            | 1                 |
| 18 | 214             | 19725            | 1                 |
| 19 | 214             | 15684            | 1                 |
| 20 | 214             | 11666            | 1                 |
| 21 | 214             | 26941            | 1                 |

This time we're transforming the daily, transaction-level table into a summary of Total Quantity grouped by both Product Key and Customer Key (using the "Advanced" option)

NOTE: This is like creating a PivotTable in Excel and pulling in Sum of Order Quantity with Product Key and Customer Key as row labels



"Select [ColumnName], Aggregation Expression FROM TABLE NAME  
GROUP BY [ColumnName];"

X ✓ 1 Product Name = RELATED('Product Lookup'[ProductName])

| ProductKey | CustomerKey | Total Quantity | Product Name                   |
|------------|-------------|----------------|--------------------------------|
| 490        | 11078       | 1              | Short-Sleeve Classic Jersey, L |
| 480        | 11078       | 4              | Patch Kit/8 Patches            |
| 486        | 11078       | 1              | All-Purpose Bike Stand         |
| 530        | 11078       | 1              | Touring Tire Tube              |
| 474        | 11078       | 1              | Women's Mountain Shorts, S     |
| 215        | 11078       | 1              | Sport-100 Helmet, Black        |
| 529        | 11078       | 2              | Road Tire Tube                 |
| 538        | 11078       | 2              | LL Road Tire                   |
| 479        | 11078       | 3              | Road Bottle Cage               |
| 477        | 11078       | 2              | Water Bottle - 30 oz.          |