How to Combine Columns in Power BI Using Append Queries

Authored by

mohammed looti

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In the realm of data analysis and business intelligence, the ability to manipulate and structure data efficiently is paramount. Within Power BI, users frequently encounter scenarios where information stored across multiple separate columns must be merged into a single, cohesive field. This process, known as concatenation, is essential for tasks like creating unique identifier keys, generating full names from first and last name fields, or combining addresses for geographical mapping purposes. While concatenation is often thought of as a simple string operation, performing it correctly within the Power BI environment requires understanding specific functions available in either Power Query or DAX (Data Analysis Expressions).

While the initial approach mentioned in some contexts involves combining entire tables using the "Append Queries" function, it is critical to clarify that "Append Queries" is fundamentally designed for combining rows from two tables with matching schemas, stacking one dataset on top of the other. This method, rooted in the Power Query environment (M language), is ideal for combining data sources, but it does not perform column-level string concatenation. True column concatenation, which involves merging the values within corresponding cells across columns into a single new column, is primarily achieved using DAX formulas, which provide the necessary calculation context for creating new calculated columns within the data model.

Leveraging DAX for Column Combination

Data Analysis Expressions, or DAX, provides a powerful functional language used to create new information from data already in your model. When concatenating columns, DAX offers specialized functions designed specifically for string manipulation. The primary function employed for this purpose is `CONCATENATE`, which is versatile but often limited to combining exactly two string arguments. For combining more than two columns, or for complex operations involving separators and multiple data types, the ampersand operator (`&`) offers far greater flexibility and control over the resulting string structure.

Using DAX allows the calculation to be performed on the fly based on the relationships and filters applied in the report context, which is a major advantage over static transformations performed in Power Query. When you define a new calculated column using DAX, the calculation is executed row-by-row across the table, ensuring that the concatenated result is accurate for every record. It is crucial to remember that the columns being concatenated must be of a string format, or easily convertible to strings, as concatenation is a fundamental text operation.

We will now explore two fundamental formulas using DAX to achieve column concatenation. These examples demonstrate the core methods: a simple, unseparated join using the dedicated function, and a more flexible join utilizing the concatenation operator (`&`) alongside text literals to introduce necessary spacing or punctuation. Mastering these two approaches is essential for any Power BI developer seeking to enrich their data model.

Formula 1: Concatenate Two Columns with No Separator

New Column = CONCATENATE('my_data', 'my_data')

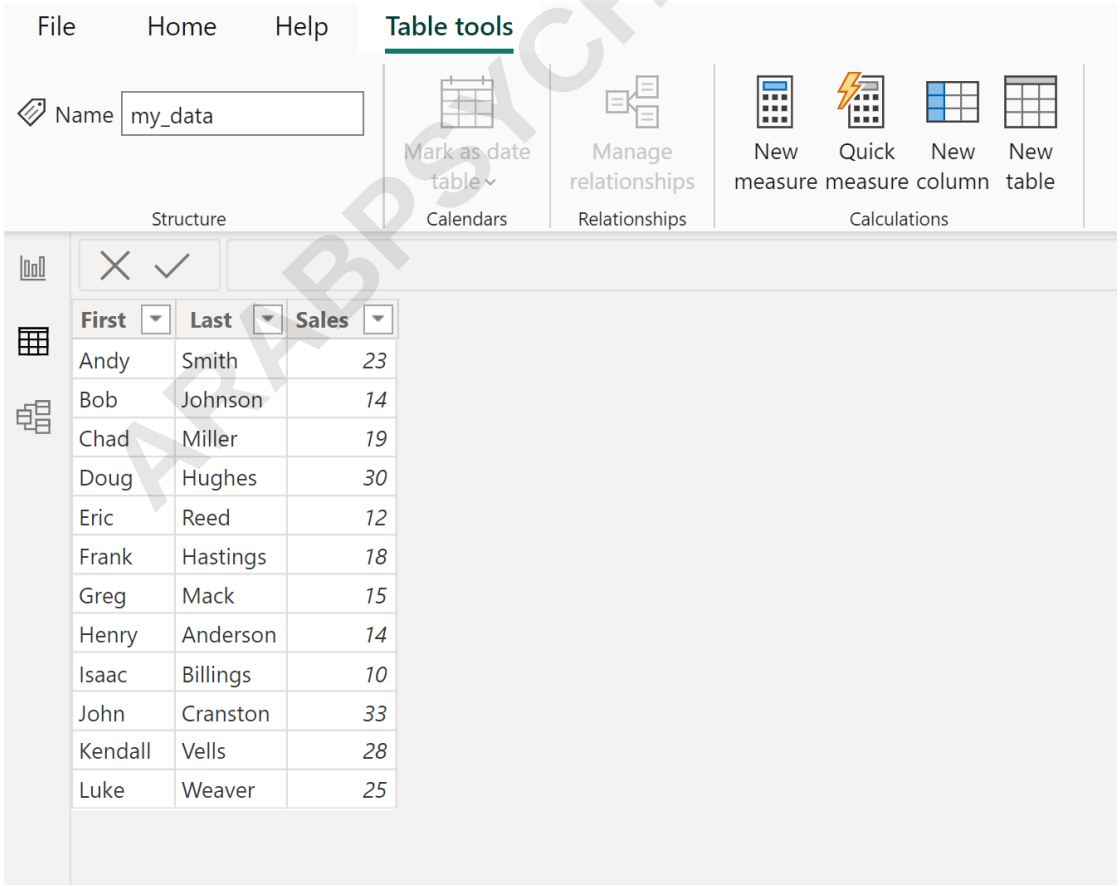
This particular formula utilizes the strict `CONCATENATE` function, which is designed to accept exactly two arguments. It effectively concatenates the strings found in `Column 1` and `Column 2` together with no separator between them, resulting in a single continuous text string.

Formula 2: Concatenate Two Columns with Separator

New Column = CONCATENATE('my_data' & " ", 'my_data')

This formula demonstrates a slightly more complex structure where the first argument to `CONCATENATE` is an expression. It uses the **&** symbol to join the value from `Column 1` with a literal space character (`" "`), creating an intermediate string, which is then joined with the value from `Column 2`. This method is preferred when clarity requires proper spacing or punctuation.

The following examples show how to use each formula in practice with the sample table named **my_data** in Power BI, which contains separate columns for **First** and **Last** names:



First	Last	Sales
Andy	Smith	23
Bob	Johnson	14
Chad	Miller	19
Doug	Hughes	30
Eric	Reed	12
Frank	Hastings	18
Greg	Mack	15
Henry	Anderson	14
Isaac	Billings	10
John	Cranston	33
Kendall	Vells	28
Luke	Weaver	25

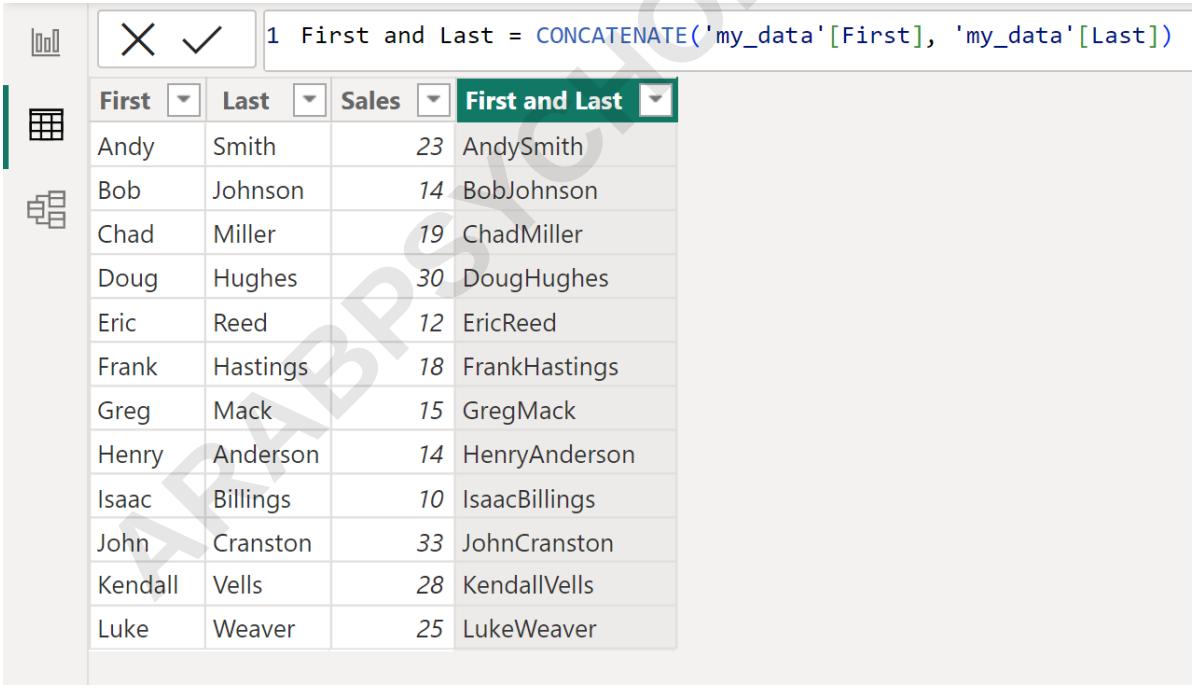
Example 1: Concatenate Two Columns with No Separator

To concatenate the strings in the **First** and **Last** columns together with no separator, you must first define a new calculated column. Navigate to the **Table tools** tab in Power BI Desktop after selecting your table, and then click the **New column** icon. This action opens the Formula Bar where the DAX expression will be entered.

This approach is ideal for internal identifiers or merging codes where any intervening character is undesirable. Type the following formula into the Formula Bar, ensuring the table and column references match your data model exactly:

First and Last = CONCATENATE('my_data', 'my_data')

This will create a new column named **First and Last** that concatenates the strings in the **First** and **Last** columns together with no separator. As illustrated below, the resulting names are merged immediately adjacent to one another, highlighting the function's strict two-argument joining behavior:



First	Last	Sales	First and Last
Andy	Smith	23	AndySmith
Bob	Johnson	14	BobJohnson
Chad	Miller	19	ChadMiller
Doug	Hughes	30	DougHughes
Eric	Reed	12	EricReed
Frank	Hastings	18	FrankHastings
Greg	Mack	15	GregMack
Henry	Anderson	14	HenryAnderson
Isaac	Billings	10	IsaacBillings
John	Cranston	33	JohnCranston
Kendall	Vells	28	KendallVells
Luke	Weaver	25	LukeWeaver

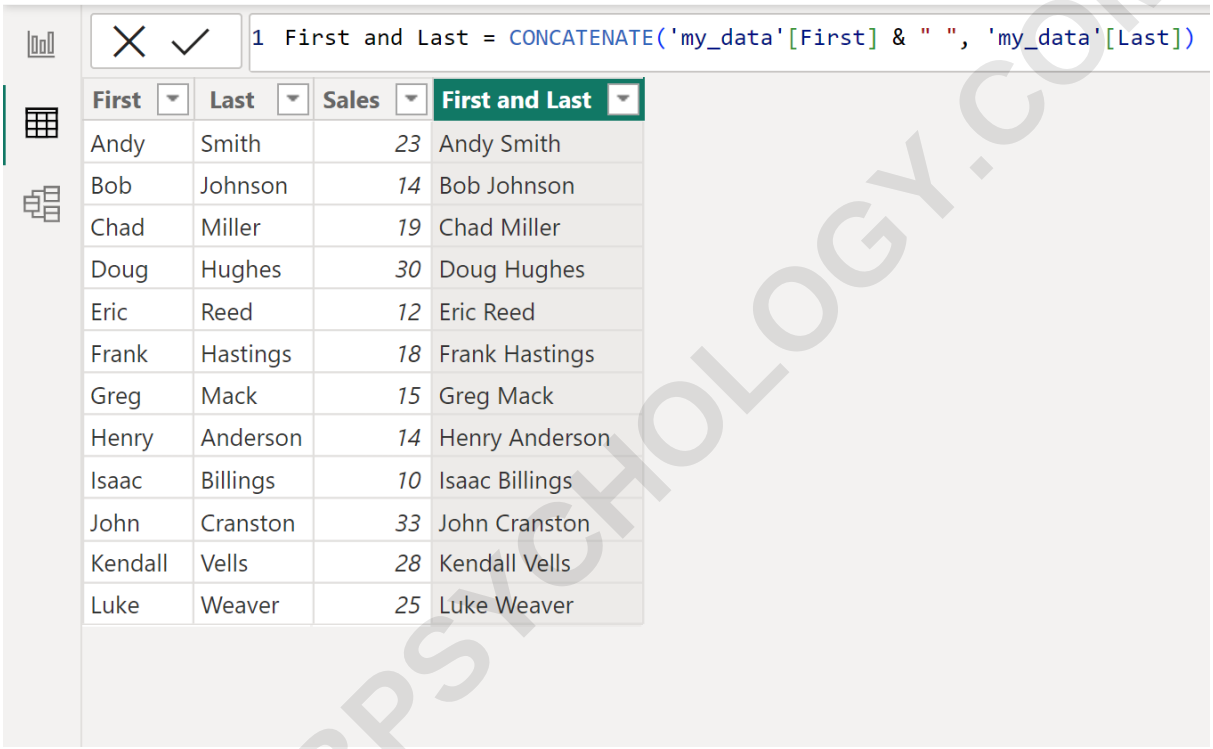
Example 2: Concatenate Two Columns with Separator

When preparing data for reports, especially for full names, inserting a separator like a space is critical for readability. To concatenate the strings in the **First** and **Last** columns together with a specific separator, begin by clicking the **Table tools** tab, then click the **New column** icon. This

opens the Formula Bar where we will leverage the ampersand operator for customization.

The formula below constructs the desired full name by first joining the **First** name with a space literal (`" "`) using the `&` operator, and then joining that intermediate result with the **Last** name value. This technique ensures the output adheres to standard naming conventions. Enter the following detailed formula into the Formula Bar:

First and Last = CONCATENATE('my_data' & " ", 'my_data')



First	Last	Sales	First and Last
Andy	Smith	23	Andy Smith
Bob	Johnson	14	Bob Johnson
Chad	Miller	19	Chad Miller
Doug	Hughes	30	Doug Hughes
Eric	Reed	12	Eric Reed
Frank	Hastings	18	Frank Hastings
Greg	Mack	15	Greg Mack
Henry	Anderson	14	Henry Anderson
Isaac	Billings	10	Isaac Billings
John	Cranston	33	John Cranston
Kendall	Vells	28	Kendall Vells
Luke	Weaver	25	Luke Weaver

Note that we chose to use a space as a separator, but you could use any delimiter you'd like by specifying it after the **&** symbol within the double quotes. The flexibility provided by the ampersand operator extends far beyond simple spacing, allowing for complex formatting required by stringent data quality standards.

Advanced Custom Separators

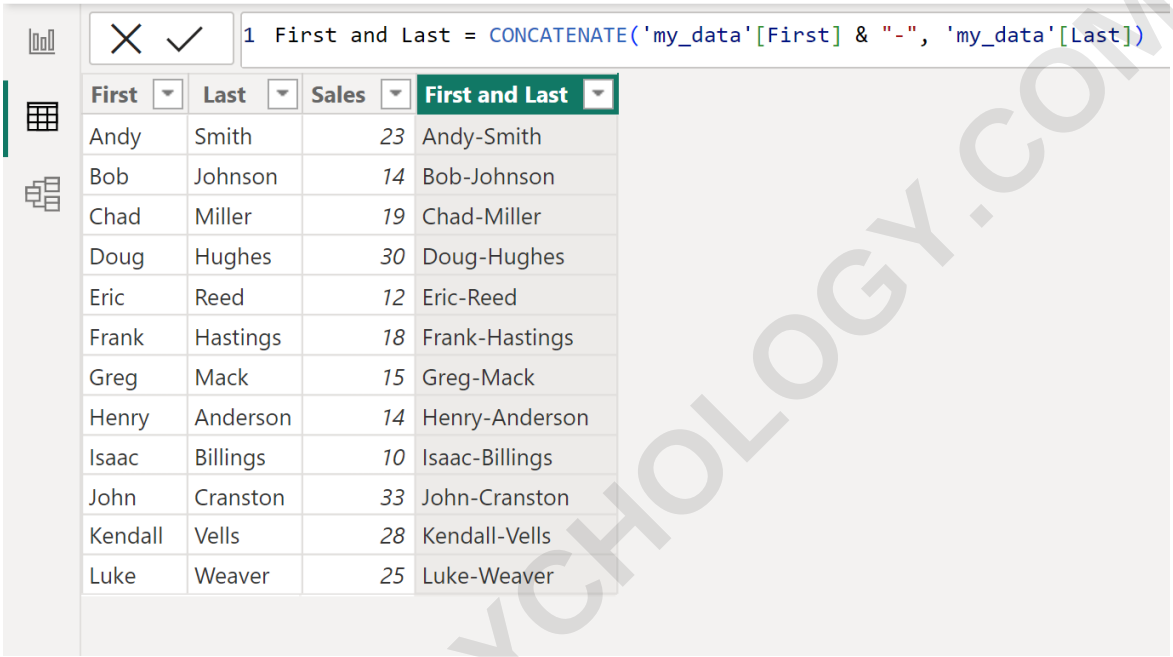
The ability to define custom separators is a powerful aspect of DAX string manipulation. If, for instance, your data model requires a dash or underscore to separate key elements for internal referencing, you can easily substitute the space literal in the previous example with the required character. This guarantees standardization across various data transformation tasks.

For example, you could use the following syntax to use a dash as a separator, which is often used

in structured identifiers:

First and Last = CONCATENATE('my_data' & "-", 'my_data')

This will concatenate the values from the First and Last columns together with a dash in between them, providing a clear demonstration of how easily the separator can be adapted to various formatting needs:



First	Last	Sales	First and Last
Andy	Smith	23	Andy-Smith
Bob	Johnson	14	Bob-Johnson
Chad	Miller	19	Chad-Miller
Doug	Hughes	30	Doug-Hughes
Eric	Reed	12	Eric-Reed
Frank	Hastings	18	Frank-Hastings
Greg	Mack	15	Greg-Mack
Henry	Anderson	14	Henry-Anderson
Isaac	Billings	10	Isaac-Billings
John	Cranston	33	John-Cranston
Kendall	Vells	28	Kendall-Vells
Luke	Weaver	25	Luke-Weaver

Summary of Concatenation Methods

In summary, successfully concatenating two columns in Power BI is fundamentally achieved through the use of DAX calculated columns. While the dedicated `CONCATENATE` function works well for two arguments without complex formatting, the ampersand operator (`&`) is the preferred method for any scenario involving separators or the chaining of more than two text fields, as it provides the necessary control over the output structure.

The following tutorials explain how to perform other common tasks in Power BI: