

How to Calculate Quartiles in Power BI: A Step-by-Step Guide

Authored by
mohammed loot

January 9, 2026

RECOMMENDED CITATION

mohammed loot (2026). *How to Calculate Quartiles in Power BI: A Step-by-Step Guide*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=125229>

Quartiles are fundamental statistical measures crucial for understanding the distribution and spread of a dataset. They function by dividing the data into four segments, with each segment containing exactly 25% of the observed values. In the powerful analytical environment of Power BI, calculating these quartiles is efficiently achieved using the specialized PERCENTILEX.INC function within Data Analysis Expressions (DAX). This capability allows analysts to quickly gain insights into data distribution without relying solely on the mean or median.

Consider a scenario involving a large dataset of sales figures spanning several quarters. If this dataset contains 100 distinct sales values, we can leverage the PERCENTILEX.INC function to pinpoint the exact value corresponding to the first quartile (Q1). This is done by specifying the dataset and providing the fractional value of 0.25, which represents the 25th percentile. The result is the threshold below which 25% of all sales figures fall. Similarly, calculating the second quartile (Q2), which is also the median, involves using the input value 0.5 (the 50th percentile), and the third quartile (Q3) requires 0.75 (the 75th percentile). Utilizing these quartiles is essential for comprehensive data analysis, enabling the identification of the central tendency, the dispersion of the data, and crucially, any potential outliers that might skew average metrics.

The Statistical Significance of Quartiles

In the realm of statistics, quartiles are precisely defined values that act as boundary markers, splitting a quantitative dataset into four equivalent portions. Understanding these divisions is vital for non-parametric statistical analysis, especially when the data distribution is non-normal or heavily skewed. By focusing on quartiles, analysts can characterize the spread of data robustly, offering a clearer picture than methods overly sensitive to extreme values.

The use of quartiles forms the foundation for tools like the Interquartile Range (IQR) and box plots, which are indispensable for visualizing data variability. They offer immediate insights into where the bulk of the data lies and how far the extreme values extend from the center. This level of descriptive statistics provides a foundational understanding before moving into more advanced inferential techniques.

When preparing to analyze any data distribution, attention is typically directed toward these specific quartile definitions:

First Quartile (Q1): This value marks the point at which 25% of all data points fall below it. It is synonymous with the 25th percentile.

Second Quartile (Q2): Representing the midpoint of the dataset, 50% of the data lies below this value. This is the 50th percentile, commonly known as the **Median**.

Third Quartile (Q3): This boundary signifies that 75% of the data points are less than or equal to this value. It corresponds directly to the 75th percentile.

Implementing Quartile Calculation Using DAX

Within Power BI, the calculation of quartiles is handled efficiently by creating custom measures using DAX. While several percentile functions exist, PERCENTILE.INC is the function generally recommended for calculating quartiles as it aligns with the standard definition of percentile calculation, including the specified percentile value itself. This function requires two main arguments: the column containing the numerical data and the fractional value representing the desired percentile (k).

To calculate all three essential quartiles for a specific numerical column within a table in DAX, you would use the following structured syntax. Note that these are typically created as explicit measures within the Power BI model, allowing for dynamic calculation across different contexts and filters.

Q1 = PERCENTILE.INC(table_name, 0.25)

Q2 = PERCENTILE.INC(table_name, 0.5)

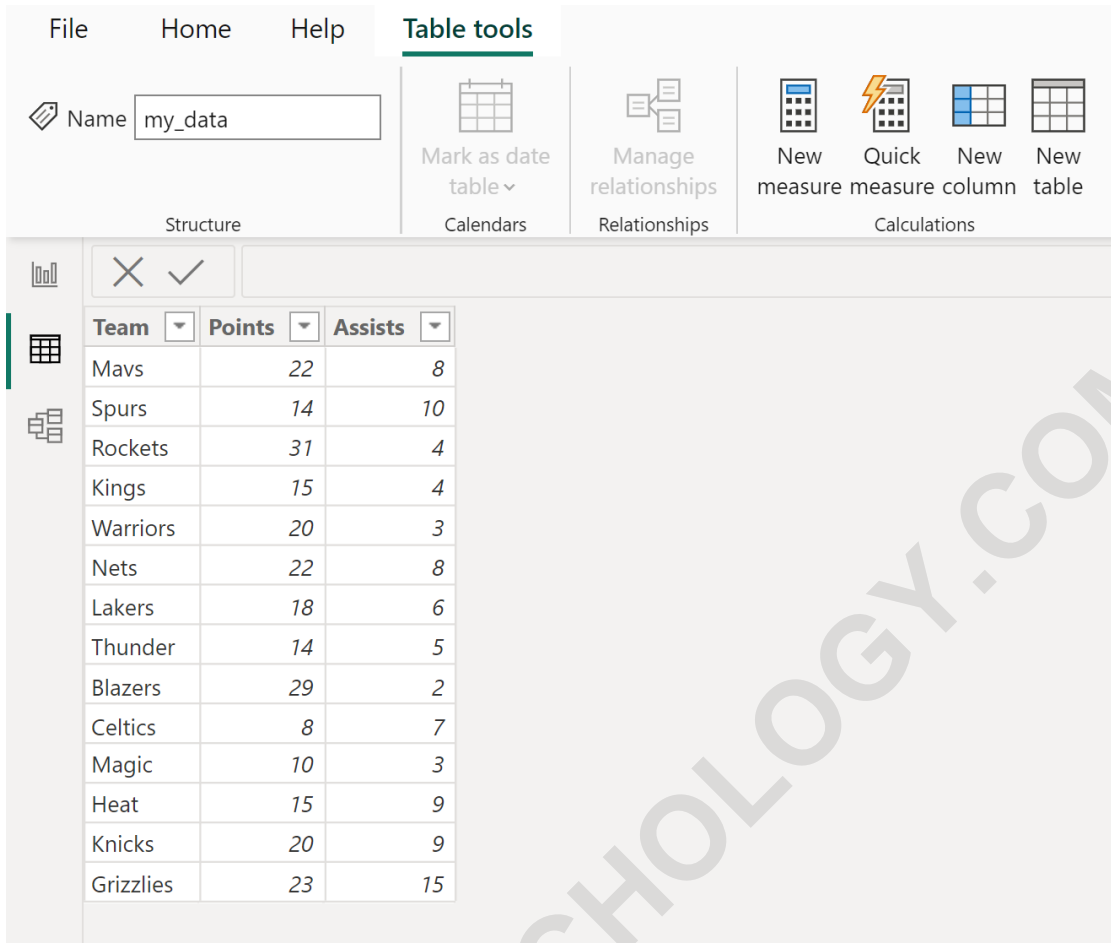
Q3 = PERCENTILE.INC(table_name, 0.75)

It is important to ensure that the **table_name** and **column_name** references are accurate reflections of your data model structure. Misspelling or incorrectly referencing the column will result in an error during the measure validation process. By separating these calculations into distinct measures (Q1, Q2, Q3), you establish reusable components that can be placed on visuals, used in other formulas, or displayed in cards or tables for quick analysis.

Practical Example: Calculating Quartiles in Power BI

To solidify the understanding of this DAX implementation, we will walk through a concrete example. Suppose we are working with a sports analytics scenario and have imported the following table into Power BI, named **my_data**. This table contains various metrics for basketball players, including a focus on their accumulated points throughout a season.

The objective is to calculate the distribution of player points by identifying the first, second, and third quartiles for the **Points** column. This will help us understand the performance spread: what score separates the bottom 25% of players from the rest, and what score places a player in the top 25%?



The screenshot displays the Power BI interface with the 'Table tools' ribbon selected. The ribbon includes options for 'Name' (my_data), 'Mark as date table', 'Manage relationships', 'New measure', 'Quick measure', 'New column', and 'New table'. Below the ribbon, a data table is visible with columns for 'Team', 'Points', and 'Assists'. The table contains 14 rows of data for various NBA teams.

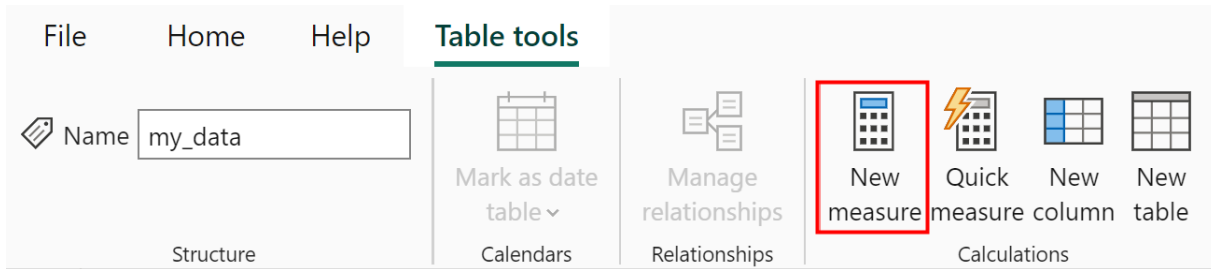
Team	Points	Assists
Mavs	22	8
Spurs	14	10
Rockets	31	4
Kings	15	4
Warriors	20	3
Nets	22	8
Lakers	18	6
Thunder	14	5
Blazers	29	2
Celtics	8	7
Magic	10	3
Heat	15	9
Knicks	20	9
Grizzlies	23	15

This visualization of the raw data shows the need for statistical summaries, as simply reviewing all rows manually is inefficient. Calculating quartiles offers a concise summary of the central tendency and spread of this performance dataset, which is essential for benchmarking player efficiency and identifying potential performance gaps.

Step-by-Step: Calculating the First Quartile (Q1)

Our primary goal is to determine the first quartile for the **Points** column. In Power BI Desktop, measures are created using the 'New measure' feature, which is accessible via the modeling ribbon. This ensures that the calculation is dynamic and responds to user filtering or slicing of the data.

To calculate the first quartile (Q1), first navigate to the **Table tools** tab in the Power BI interface. Within this tab, locate and click the **New measure** icon. This action opens the formula bar, prompting you to define the DAX expression for the new measure. This structured approach ensures that the statistical calculation is integrated directly into the semantic model of your report.



Once the formula bar is active, input the following specific DAX formula. This formula targets the **Points** column within the **my_data** table and requests the value corresponding to the 25th percentile (0.25):

Q1 Points = PERCENTILE.INC(my_data, 0.25)

Executing this DAX expression creates a new measure named **Q1 Points**. This measure holds a single, scalar value representing the first quartile of all player scores. This value is immediately available for use in any visual or calculation within the Power BI report environment.

Defining Measures for Q2 and Q3

With the Q1 measure successfully established, the calculation for the second (Q2) and third (Q3) quartiles follows an identical procedure, requiring only a minor adjustment to the percentile argument (k). This repetition highlights the modularity and efficiency of using DAX measures for statistical summary metrics.

Repeat the process: click **New measure** again for Q2. This time, replace the **0.25** argument with **0.5**, signifying the 50th percentile, or the median. The resulting measure, perhaps named **Q2 Points**, will provide the central value of the distribution. For the final quartile, Q3, repeat the process one last time, replacing the argument with **0.75**, representing the 75th percentile.

The syntax for the remaining quartiles would be:

For Q2 (Median): Q2 Points = `PERCENTILE.INC(my_data, 0.5)`

For Q3: Q3 Points = `PERCENTILE.INC(my_data, 0.75)`

By implementing all three measures, you establish a comprehensive statistical framework for assessing the **Points** performance distribution within the **my_data** table, ensuring robust calculation irrespective of how the data model evolves.

Reviewing and Interpreting the Calculation Results

Once all three measures (Q1 Points, Q2 Points, and Q3 Points) have been successfully created, they will appear in the Fields pane alongside your table data. Although they are calculated values, they act as constants unless the underlying data model is filtered. You can display these measures in a simple card or table visual to see the resulting quartile values clearly.

The screenshot displays the Power BI interface with the 'Measure tools' ribbon active. The 'Name' field is set to 'Q1 Points', and the 'Home table' is 'my_data'. The 'Format' dropdown is set to 'General', and the 'Auto' dropdown is set to 'Auto'. Below the ribbon, the DAX formula for the measure is shown: `1 Q1 Points = PERCENTILE.INC(my_data[Points], 0.25)`. The table visual below shows the following data:

Team	Points	Assists
Mavs	22	8
Spurs	14	10
Rockets	31	4
Kings	15	4
Warriors	20	3
Nets	22	8
Lakers	18	6
Thunder	14	5
Blazers	29	2
Celtics	8	7
Magic	10	3
Heat	15	9
Knicks	20	9
Grizzlies	23	15

The visualization above shows the result of the Q1 calculation. After deriving all three quartiles and grouping them together for comparison, the summary of the distribution becomes instantly accessible, facilitating rapid data analysis and decision-making.

Team	Points	Assists
Blazers	29	2
Celtics	8	7
Grizzlies	23	15
Heat	15	9
Kings	15	4
Knicks	20	9
Lakers	18	6
Magic	10	3
Mavs	22	8
Nets	22	8
Rockets	31	4
Spurs	14	10
Thunder	14	5
Warriors	20	3

14.25

Q1 Points

19.00

Q2 Points

22.00

Q3 Points

Upon reviewing the compiled output, we obtain the following critical boundary values:

The first quartile (Q1) is located at **14.25**. This means 25% of the players scored 14.25 points or fewer.

The second quartile (Q2), or the median, is located at **19**. Half of the players scored 19 points or less, and half scored more.

The third quartile (Q3) is located at **22**. This threshold indicates that 75% of the players scored 22 points or fewer, placing the top 25% of performers above this value.

Analyzing Distribution and Identifying Outliers

By knowing just these three quartile values (14.25, 19, and 22), we gain a powerful and concise understanding of the distribution of player performance in the **Points** column. The difference between Q1 and Q3 ($22 - 14.25 = 7.75$) defines the Interquartile Range (IQR), which measures the spread of the middle 50% of the data. A smaller IQR suggests data points are tightly clustered around the median, while a larger IQR indicates greater variability among the middle performers.

Furthermore, these quartile boundaries are instrumental in identifying potential outliers. An outlier is often defined as a data point that falls more than 1.5 times the IQR below Q1 or above Q3. Using our calculated values, the lower bound for standard data would be $Q1 - (1.5 * IQR)$, and the upper bound would be $Q3 + (1.5 * IQR)$. Any player score falling outside these calculated limits warrants further investigation, as it may represent exceptional performance or a data entry error.

The ability to quickly calculate and leverage these statistical markers within Power BI using DAX enhances the depth of data storytelling and provides actionable intelligence. It moves the analysis beyond simple averages to a more nuanced view of data spread and extremity.

Leveraging DAX Documentation for Advanced Use

For advanced scenarios, such as handling different percentile calculation methods or dealing with highly complex data models, consulting the official DAX documentation is highly recommended. While **PERCENTILE.INC** is typically suitable for quartile analysis, other functions like **PERCENTILE.EXC** (which excludes the extremes) may be preferred depending on specific statistical requirements or organizational policies regarding inclusive versus exclusive percentile definitions.

Note: You can find the complete, authoritative documentation for the **PERCENTILE.INC** function in DAX on the Microsoft Docs website. Reviewing the examples and context notes provided there ensures optimal utilization in production environments.

Mastering these fundamental DAX statistical functions is a critical skill for any Power BI developer aiming to provide robust, distribution-aware reports and dashboards.

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