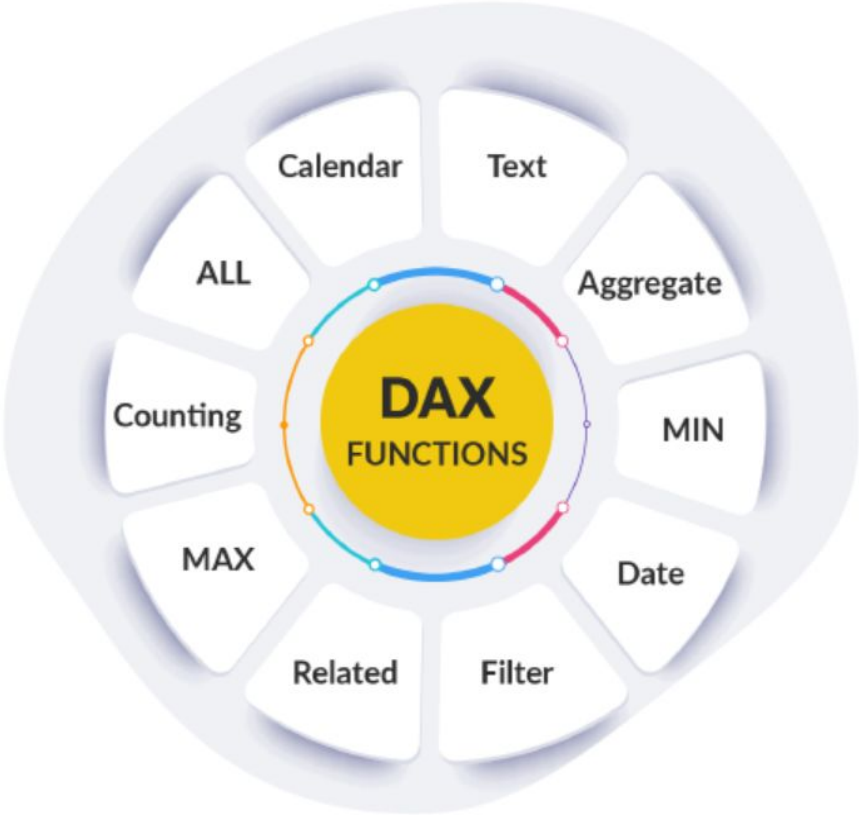
DAX Formulas in Power BI



Calculated Column in Power BI

Definition: A calculated column is a new column that you create in a table using DAX (Data Analysis Expressions). The value for each row is calculated when the column is created, and it remains static unless the data is refreshed.

Example

```
Tax = SalesData[Total_Sales]*18/100
```

Use Cases: Suitable for scenarios where you need a value for each row in the table, such as adding a new field derived from existing data (e.g., creating a "Total Price" column by multiplying "Quantity" and "Price").

Performance: Since calculated columns are stored in the model, they can affect performance, especially if the model is large.

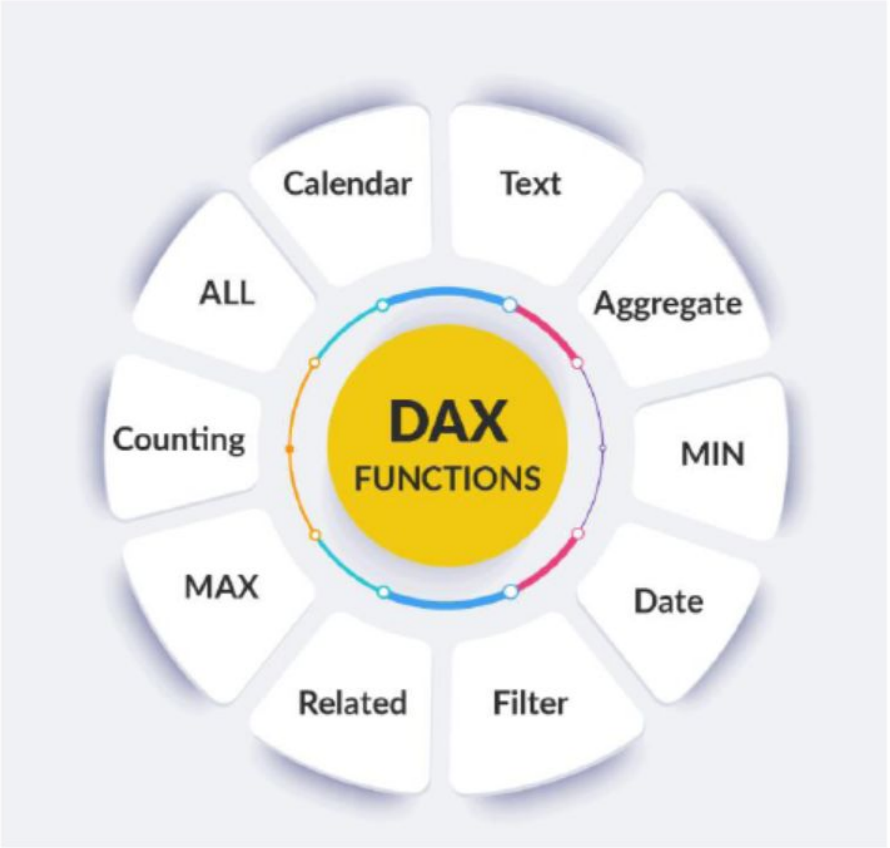
DIFFERENCE BETWEEN CALCULATED COLUMN AND MEASURE IN POWER BI

In Power BI, both **calculated columns** and **measures** are used to perform calculations, but they serve different purposes and behave differently. Here's a comparison of the two:

Key Differences:

Feature	Calculated Column	Measure
Calculation Timing	Calculated when the data is loaded or refreshed	Calculated dynamically during reporting
Storage	Stored in the data model	Not stored; calculated on the fly
Context	Row context (calculation per row)	Filter/context-dependent (changes dynamically)
Use	Adding new fields for each row	Aggregating or summarizing data
Performance Impact	Can increase model size and memory usage	Impacts report performance, not model size

SUM FORMULA


DAX
FUNCTIONS
Calendar
Text
Aggregate
MIN
Date
Filter
Related
MAX
Counting
ALL

SUM Formula in Power BI

Definition: SUM is a simple aggregation function that adds up all the values in a single column.

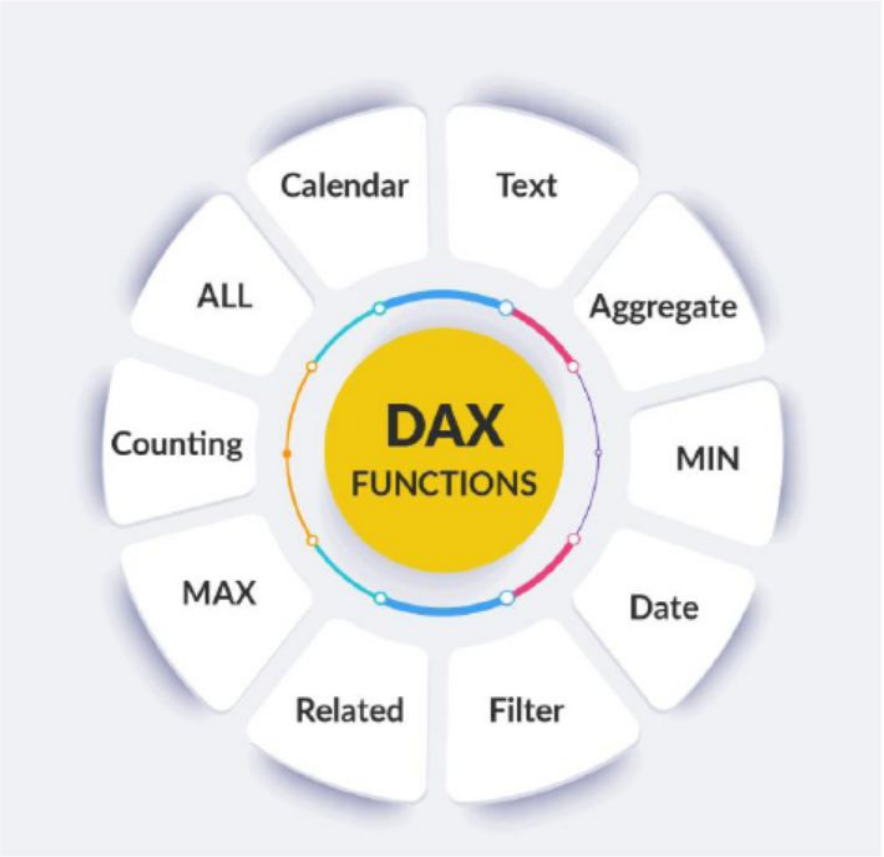
Example

Total_Sales = SUM(SalesData[Sales])

Use Case: Use SUM when you want to sum up all the values in a numeric column without any complex row-by-row operations.

Performance: Since it operates directly on a column, it's fast and efficient for simple summations.

SUMX FORMULA



SUMX Formula in Power BI

Definition: SUMX is an iterator function that performs row-by-row calculations and then sums the results.

Example

```
Total_Sales2 = SUMX(SalesData,SalesData[Quantity]*SalesData[Unit Price (INR)])
```

Use Case: Use SUMX when you need to perform a calculation for each row before summing, such as multiplying two columns together or applying conditional logic.

Performance: SUMX can be slower than SUM because it performs calculations on each row individually before summing. It's ideal for more complex scenarios that require row context.

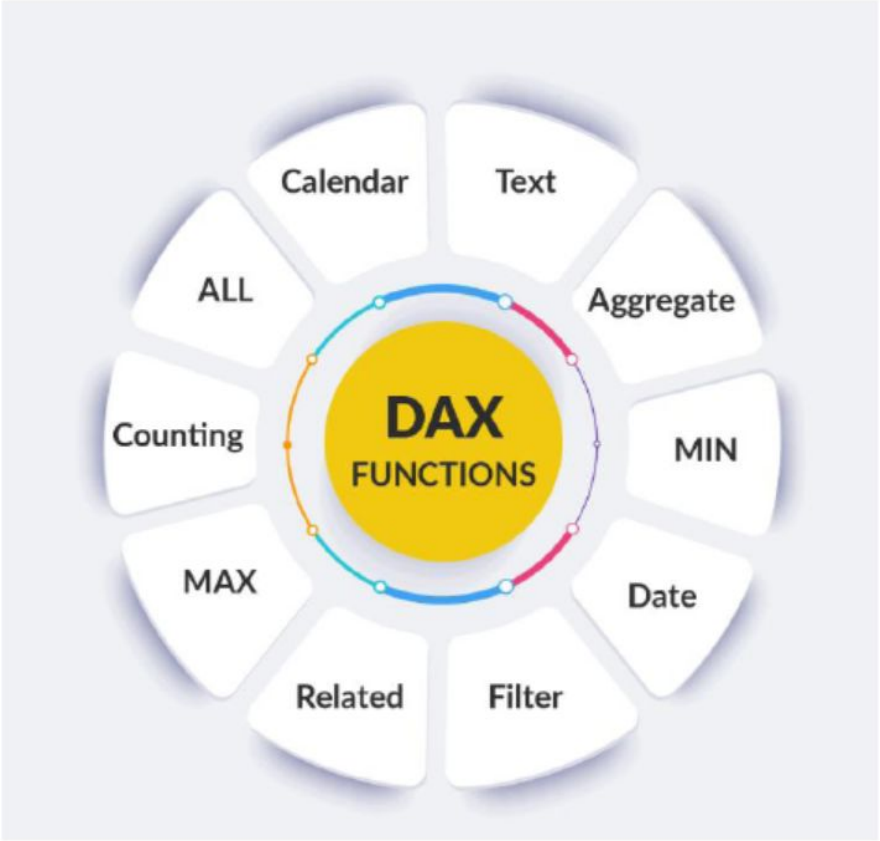
Difference between SUM and SUMX Formula in Power BI

In Power BI, both SUM and SUMX are used to perform summation, but they work differently and are used in different scenarios. Here's a breakdown of the key differences:

Key Differences:

Feature	SUM	SUMX
Function Type	Aggregation function	Iterator function
Operation	Sums all values in a single column directly	Calculates row by row based on an expression, then sums
Input	Single column	Table and an expression
Use Case	Simple summation of a numeric column	When you need to calculate something for each row before summing
Performance	Fast and efficient	Slower for large datasets, as it iterates over rows

COUNT FORMULA



Count Formula in Power BI

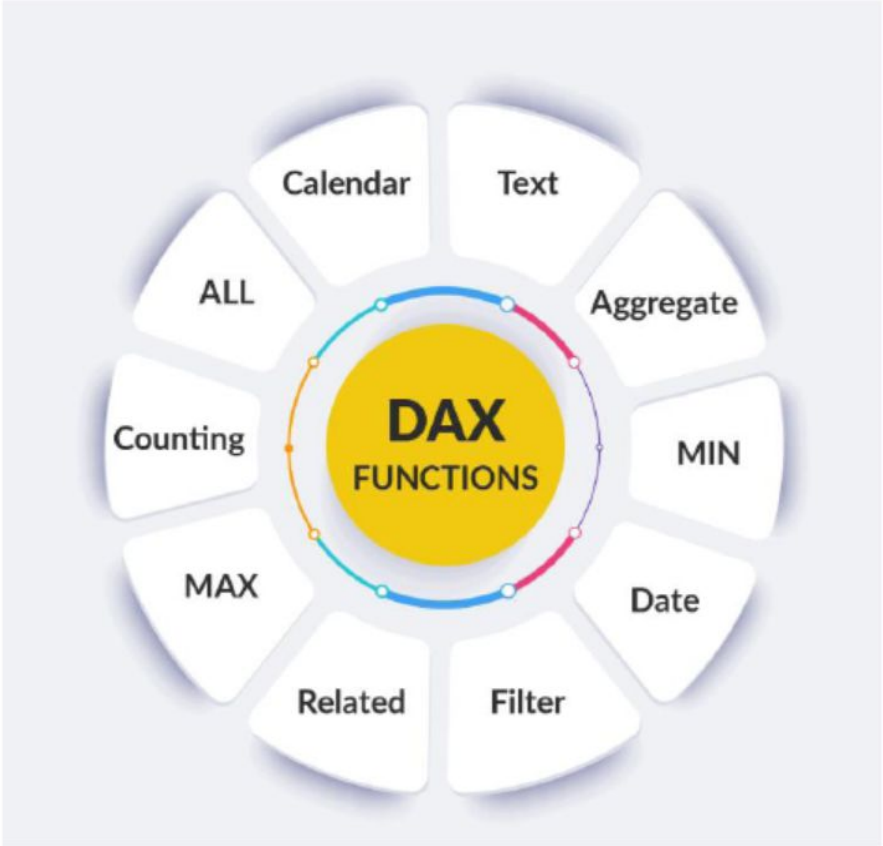
Definition: COUNT counts the number of non-blank values in a column.

Example

```
Number of Customers = COUNT('Table'[Customer ID])
```

Use Case: When you want to count the non-empty values in a column.

COUNTA FORMULA



COUNTA Formula in Power BI

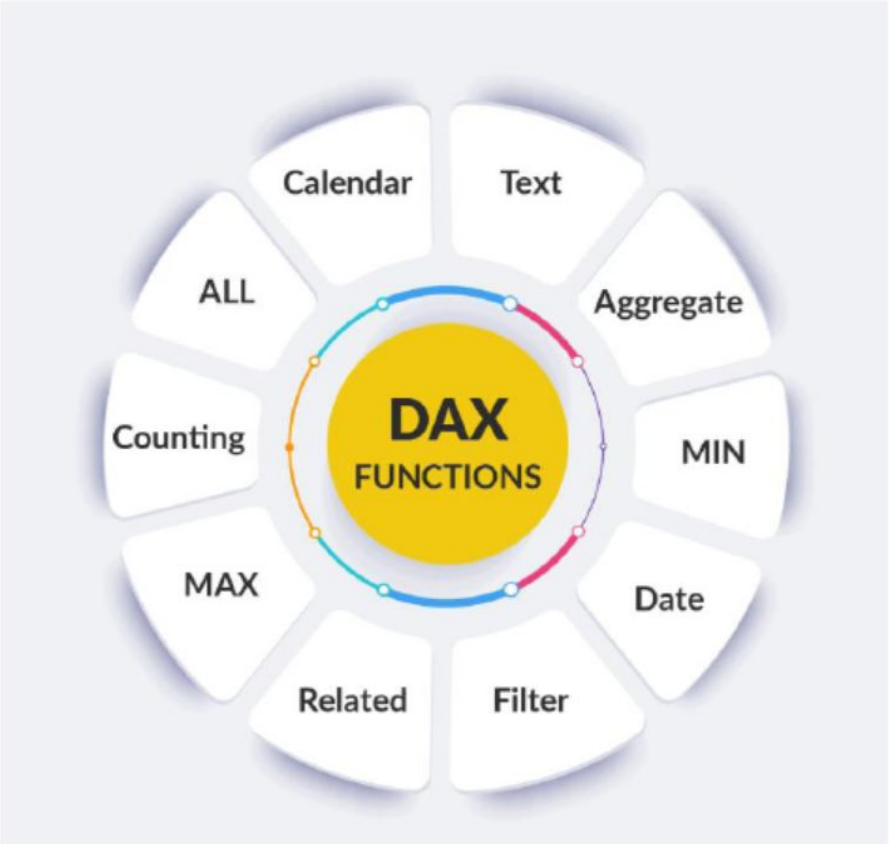
Definition: COUNTA counts the number of non-blank values in a column, including text, numeric values, and logical values even counts Boolean values where only Count will not count Boolean data type

Example

```
Number of Reviews = COUNTA('Table'[Review Status])
```

Use Case: When you need to count all non-blank values, regardless of the data type (text, numbers, etc.).

COUNTBLANK FORMULA



COUNTBLANK Formula in Power BI

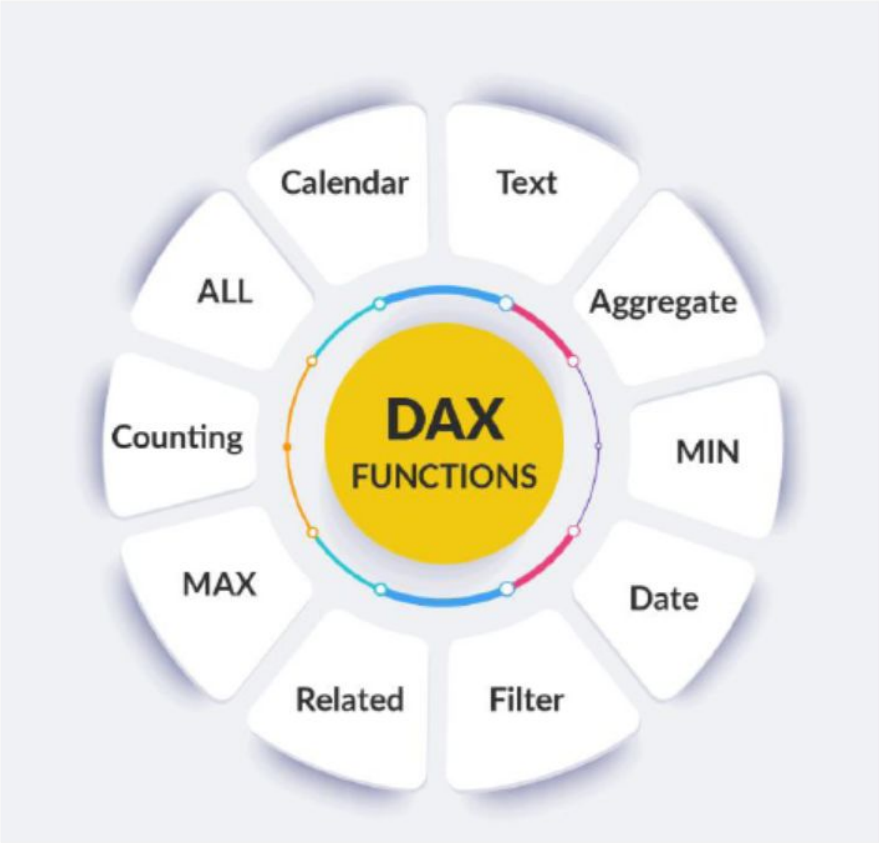
Definition: COUNTBLANK counts the number of blank (empty) values in a column.

Example

```
Blank Reveiws = COUNTBLANK('Table'[Review Points])
```

Use Case: When you want to count the number of blank or missing values in a column.

COUNTROWS FORMULA



COUNTROWS Formula in Power BI

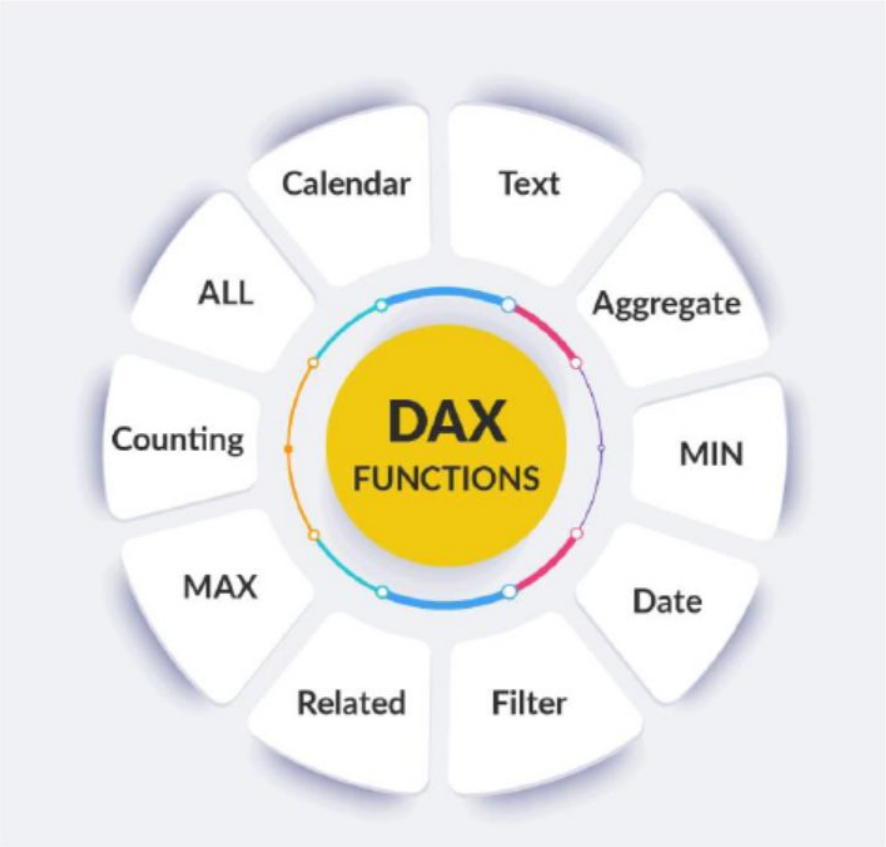
Definition: COUNTROWS counts the number of rows in a table.

Example

```
Total Records = COUNTROWS('Table')
```

Use Case: When you want to count the total number of rows in a table or in a filtered table.

DISTINCTCOUNT FORMULA



DISTINCTCOUNT Formula

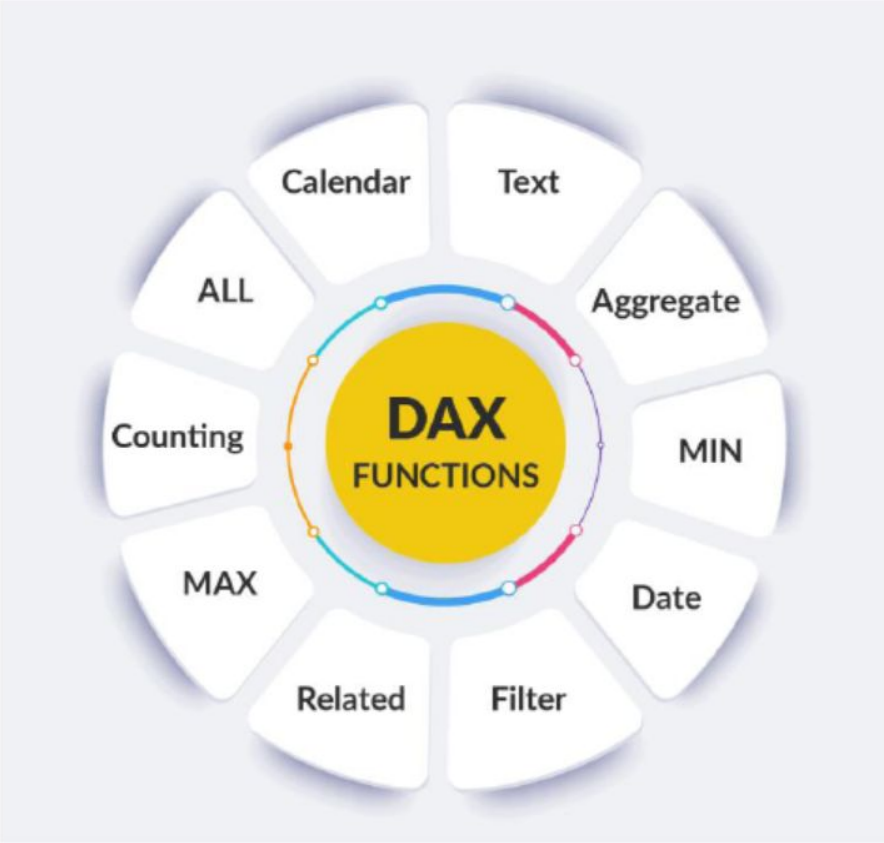
Definition: DISTINCTCOUNT counts the number of unique, non-blank values in a column.

Example

```
Unique States = DISTINCTCOUNT('Table'[State])
```

Use Case: When you need to count the distinct (unique) values in a column, excluding blanks.

COUNTX FORMULA



COUNTX Formula

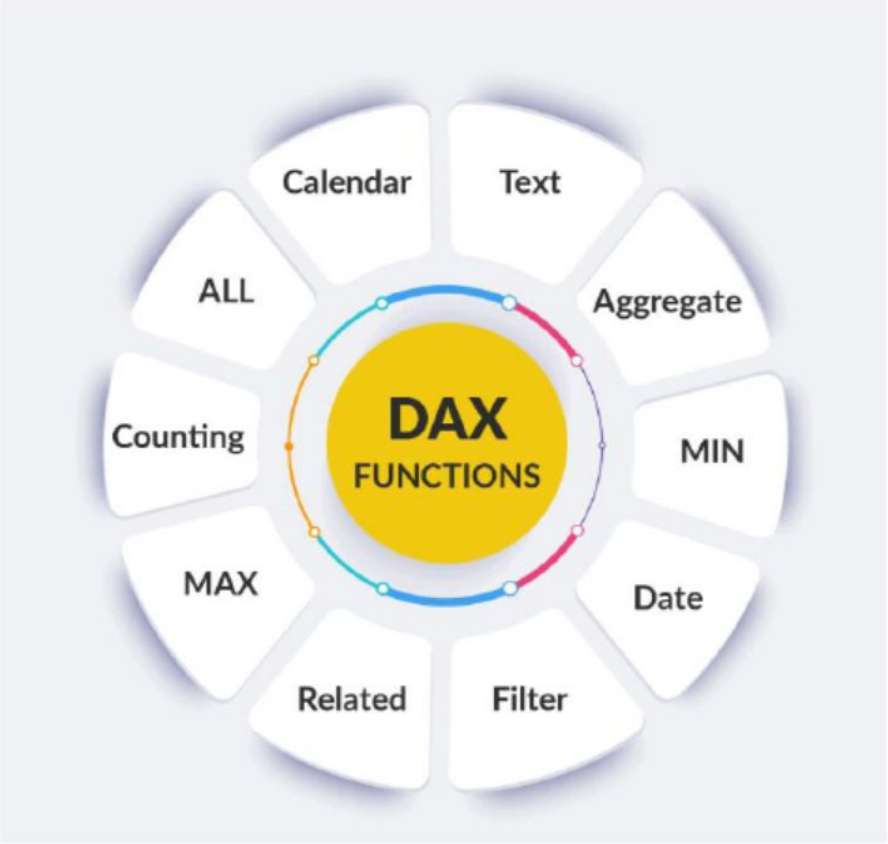
Definition: COUNTX is an iterator function that counts non-blank results of an expression evaluated row by row over a table.

Example

```
Count Reviews >= 5 = COUNTX('Table', IF('Table'[Review Points] >= 5, 1, BLANK()))
```

Use Case: When you need to count based on an expression that is evaluated for each row in a table.

COUNTAX FORMULA



COUNTAX Formula

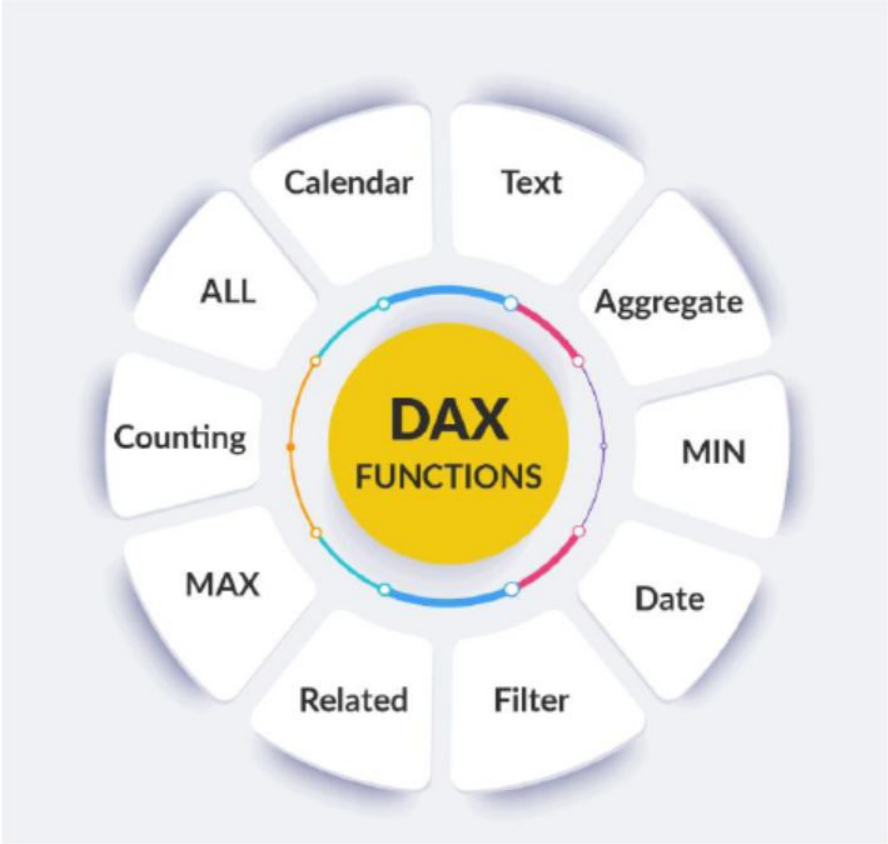
Definition: COUNTAX is the iterator version of COUNTA. It evaluates an expression for each row and counts the number of non-blank results.

Example

```
Count True = COUNTAX(FILTER('Table','Table'[Review Status]=true),'Table'[Review Status])
```

Use Case: When you need to count based on an expression that is evaluated for each row in a table even there is Binary data type.

COUNTROWS with FILTER FORMULA



COUNTROWS with FILTER Formula

Definition: COUNTROWS can be used with the FILTER function to count rows that meet specific criteria.

Example

```
Maharashtra Count = COUNTROWS(FILTER('Table','Table'[State]="Maharashtra"))
```

Use Case: When you want to count rows based on a condition or set of conditions.

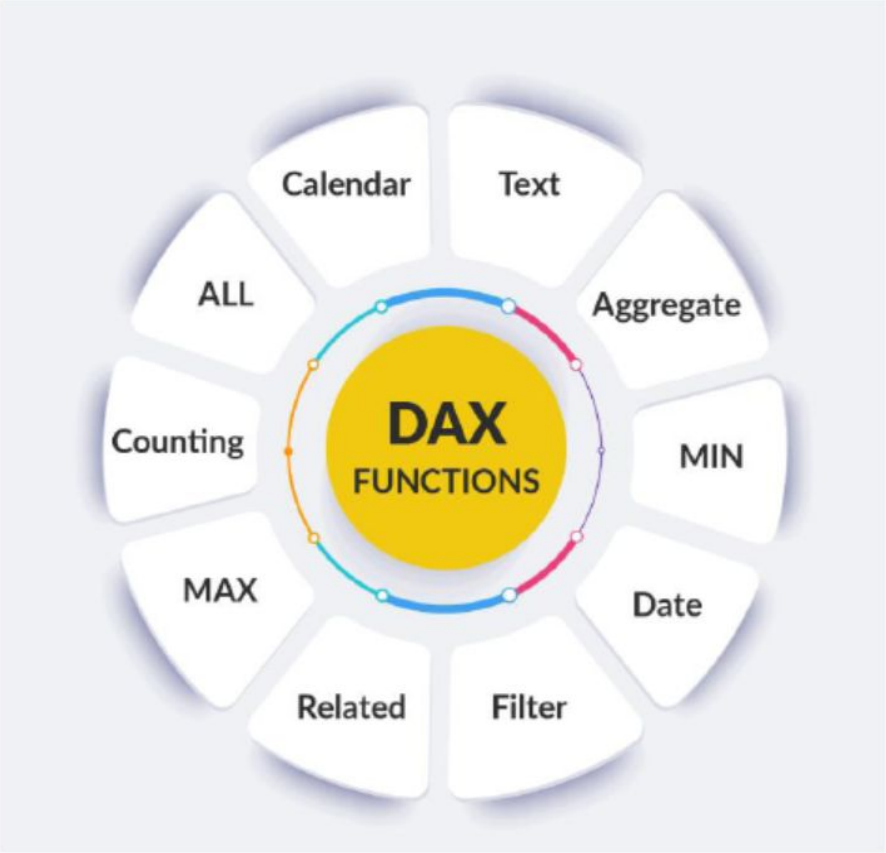
Summary of DAX Counting Functions:

These functions provide flexibility depending on whether you're counting all rows, distinct values, non-blank values, or values based on expressions and conditions.

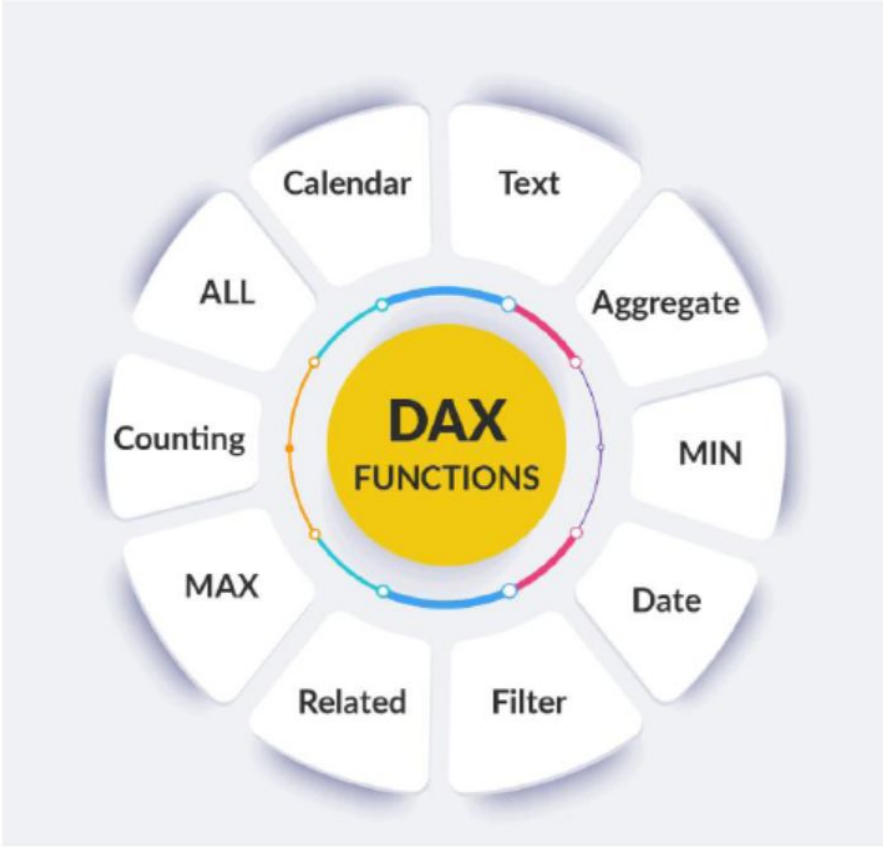
Summary of DAX Counting Functions:

Function	Purpose
COUNT	Counts non-blank numeric values in a column.
COUNTA	Counts non-blank values (including text) in a column.
COUNTBLANK	Counts the number of blank values in a column.
COUNTROWS	Counts the total number of rows in a table.
DISTINCTCOUNT	Counts unique, non-blank values in a column.
DISTINCTCOUNTNOBLANK	Counts unique, non-blank values (excludes blanks explicitly).
COUNTX	Counts non-blank results of an expression evaluated for each row.
COUNTAX	Iterative version of `COUNTA`, counting results of an expression.

Date Formulas



Create Custom Calendar



Formula

```
= CALENDAR(MIN(SalesData[Date]),MAX(SalesData[Date]))
```

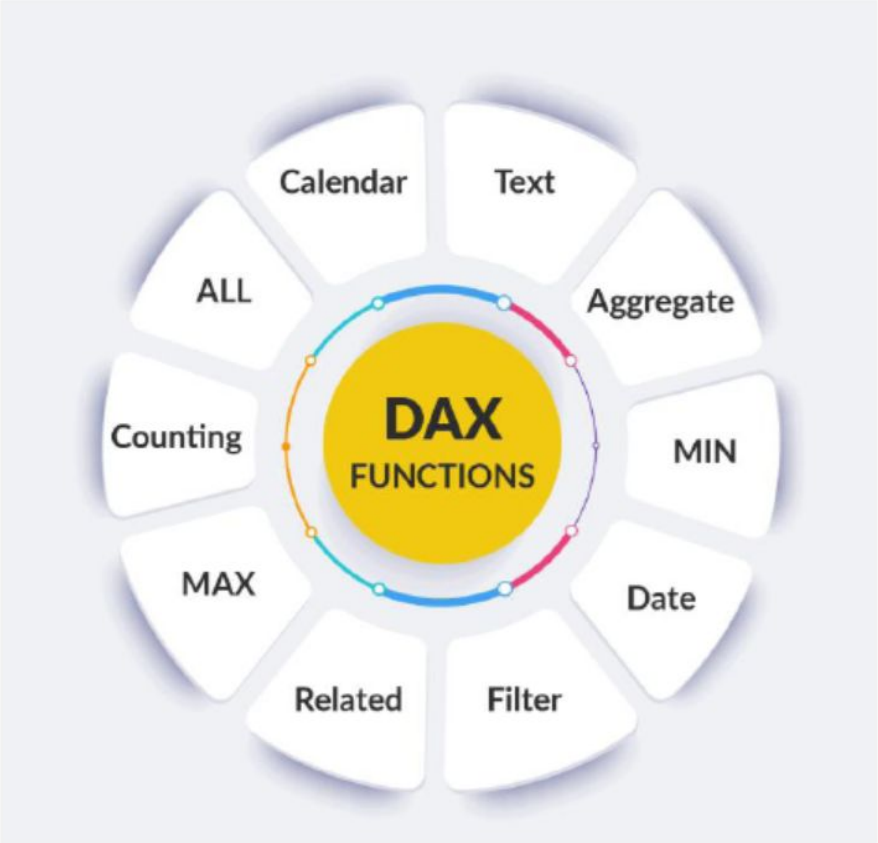
The CALENDAR DAX function in Power BI is used to generate a continuous range of dates between a specified start and end date. It's particularly useful when building a date table, which is essential for time-based calculations such as year-over-year analysis, month-to-date, quarter-to-date, etc.

Formula

```
= CALENDARAUTO()
```

The CALENDARAUTO function in Power BI is a powerful tool for creating a date table that automatically detects the date range from all date columns in your data model. This means it scans your data and generates a date range based on the minimum and maximum dates found in the model, which is especially helpful for dynamic date tables without specifying start or end dates manually.

Extract Day/Month/Year



Extract Day/Month/Year

DAY(<datetime>) : Extracts the day from a date value.

MONTH(<datetime>) : Extracts the month from a date value.

YEAR(<datetime>) : Extracts the year from a date value.

Extract Hour/Minute/Second

Hour(<datetime>) : Extracts the Hour from a date and time value.

Minute(<datetime>) : Extracts the Minute from a date and time value.

Second(<datetime>) : Extracts the Second from a date and time value.

Extract Hour/Minute/Second

Today() : Show Current date

Now() – Show current date and Time

Weekday() – Show Weekday in numbers between 1 to 7

Weeknum() – Show Week number in Month/Year

DatedIFF Formula

Definition: Returns the difference between two dates in the specified interval (days, months, years, etc.).

Syntax

```
DATEDIFF(<start_date>, <end_date>, <interval>)
```

```
Example
DATEDIFF(Sales[OrderDate], Sales[ShipDate], DAY)
```

MTD QTD AND YTD DAX FORMULA

Formula

```
Sales MTD = TOTALMTD(SUM(Sales[SalesAmount]), DateTable[Date])
Sales QTD = TOTALQTD(SUM(Sales[SalesAmount]), DateTable[Date])
Sales YTD = TOTALYTD(SUM(Sales[SalesAmount]), DateTable[Date])
```

MTD (Month-to-Date), QTD (Quarter-to-Date), and YTD (Year-to-Date) are commonly used DAX functions in Power BI for performing time-based aggregations. They are particularly helpful for tracking progress over the current month, quarter, or year, making it easy to see cumulative totals up to the present date. These functions rely on having a properly structured date table, ideally linked to your data model.

DATESBETWEEN DAX FORMULA

Formula

```
DATESBETWEEN(<dates>, <start_date>, <end_date>)
```

The DATESBETWEEN function in DAX returns a table with dates within a specified start and end date range. This function is useful when you want to filter data to specific date boundaries.

TEXT FORMULAS

In Power BI, there are several DAX functions designed for working with text data. These functions allow you to manipulate and format text values in various ways. Here are some commonly used text DAX formulas in Power BI:

LEFT, RIGHT, MID

```
LEFT("Power BI", 5)  // Result: "Power"

RIGHT("Power BI", 2)  // Result: "BI"

MID("Power BI", 7, 2)  // Result: "BI"
```

TEXT FORMULAS

In Power BI, there are several DAX functions designed for working with text data. These functions allow you to manipulate and format text values in various ways. Here are some commonly used text DAX formulas in Power BI:

UPPER and LOWER

```
UPPER("Power BI")  // Result: "POWER BI"
LOWER("Power BI")  // Result: "power bi"
```

LEN: Returns the length (number of characters) of a text string.