

DAX Functions

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Purpose

This document covers the summarized information about Data Analysis Expressions (DAX) functions by providing list of different type of DAX functions used in Power BI Service. This is high level document and assume resource has basic knowledge of DAX functional language.

What is a DAX Function?

A DAX function is an inbuilt function provided in the DAX language to enable us to perform various actions like commonly used data calculations on the data in tables in Data Model.

What is use of DAX Function?

DAX functions play an important role in usage of DAX for data modeling and reporting.

Excel Functions vs. DAX Functions

There are certain similarities and differences between the Excel functions and the DAX functions. Some of the DAX functions have same names and functionality as that of Excel functions but have been modified to work with tables and columns by using DAX data types. DAX has additional functions that are designed to work with relational data and perform dynamic aggregation. Following are the similarities and differences between Excel functions and DAX functions –

Similarities

- Many DAX functions have the same name and the same behavior as Excel functions.
- Lookup functions in DAX are very similar to the array and vector lookup functions in Excel.

Differences

- DAX functions have been modified to take different types of inputs and some of the DAX functions might return a different data type. So, we need to understand the usage of these functions separately though they have the same name.
- We cannot use Excel functions in PowerPivot workbook or DAX functions in an Excel workbook, without having the required modifications.
- In Excel, we can have data of different data types in a column whereas DAX does not support this functionality and expects same data type for the data in a column of a table. If not so, DAX changes the entire column to the data type suitable for all the values in the column.
- DAX lookup functions require that a relationship is established between the respective tables.
- DAX functions take a column or table as a reference but Excel functions take a cell or range of cells as a reference.
- Excel date and time functions return an integer that represents a date as a serial number. In contrast, DAX date and time functions return a datetime data type that is present in DAX but not in Excel.
- No function is available in Excel that returns a table, but some functions can work with arrays. Many of the DAX functions can easily reference columns and complete tables to perform calculations and return a column or a table of values.

Types of DAX Functions

DAX supports the following types of functions.

- DAX Table-Valued Functions
- ❖ DAX Filter Functions
- ❖ DAX Aggregation Functions
- ❖ DAX Time Intelligence Functions
- DAX Date and Time Functions

- DAX Information Functions
- DAX Logical Functions
- DAX Math and Trig Functions
- DAX Other Functions
- DAX Parent and Child Functions
- DAX Statistical Functions
- DAX Text Functions
- DAX Description Structure Functions

Detailed description for above functions is as follows –

DAX Table-Valued Functions

DAX functions which enable us to remove duplicate values and return only distinct values by taking tables as input or output or both are called DAX table-valued functions. These functions take single columns as input and return single column as output. Below are the types of DAX table-valued functions –

- ❖ **DAX Aggregation functions** - aggregate any expression over the rows of a table and are useful in calculations. Following is the list of DAX Aggregation functions –

1. DAX ADDCOLUMNS function
2. DAX AVERAGE function
3. DAX AVERAGEA function
4. DAX AVERAGEX function
5. DAX COUNT function
6. DAX COUNTA function
7. DAX COUNTAX function
8. DAX COUNTBLANK function
9. DAX COUNTROWS function
10. DAX COUNTX function
11. DAX CROSSJOIN function
12. DAX DISTINCTCOUNT function

13. DAX GENERATE function
14. DAX GENERATEALL function
15. DAX MAX function
16. DAX MAXA function
17. DAX MAXX function
18. DAX MIN function
19. DAX MINA function
20. DAX MINX function
21. DAX PRODUCT function
22. DAX PRODUCTX function
23. DAX ROW function
24. DAX SELECTCOLUMNS function
25. DAX SUM function
26. DAX SUMMARIZE function
27. DAX SUMMARIZE function with Options
28. DAX SUMX function
29. DAX TOPN function

- ❖ **DAX Filter functions** - These functions facilitate us to create dynamic calculations by manipulating the data context and return a column or a table or values related to the current row. We can return specific data types, filter by related values and look up values in related tables by using these functions. Following is the list of DAX Filter functions –

1. DAX ADDMISSINGITEMS function
2. DAX ALL function
3. DAX ALLEXCEPT function
4. DAX ALLNOBLANKROW function
5. DAX ALLSELECTED function
6. DAX CALCULATE function
7. DAX CALCULATETABLE function
8. DAX CROSSFILTER function

9. DAX DISTINCT function
10. DAX EARLIER function
11. DAX EARLIEST function
12. DAX FILTER function
13. DAX FILTERS function
14. DAX HASONEFILTER function
15. DAX HASONEVALUE function
16. DAX ISCROSSFILTERED function
17. DAX ISFILTERED function
18. DAX KEEPFILTERS function
19. DAX RELATED function
20. DAX RELATEDTABLE function
21. DAX USERELATIONSHIP function
22. DAX VALUES function

- ❖ **DAX Time intelligence functions** - These are the functions which help us create calculations that support the need of Business Intelligence analysis by enabling us to control data by using time periods having days, months, quarters and years. These functions return a table of dates or use a table that contain dates to make calculations based on aggregation. For example, DATEADD function returns a table having single column of date values. Following is the list of DAX Time Intelligence functions -

1. DAX CLOSINGBALANCEMONTH function
2. DAX CLOSINGBALANCEQUARTER function
3. DAX CLOSINGBALANCEYEAR function
4. DAX DATEADD function
5. DAX DATESBETWEEN function
6. DAX DATESINPERIOD function
7. DAX DATESMTD function
8. DAX DATESQTD function
9. DAX DATASYTD function
10. DAX ENDOFMONTH function

11. DAX ENDOFQUARTER function
12. DAX ENDOFYEAR function
13. DAX FIRSTDATE function
14. DAX FIRSTNONBLANK function
15. DAX LASTDATE function
16. DAX LASTNONBLANK function
17. DAX NEXTDAY function
18. DAX NEXTMONTH function
19. DAX NEXTQUARTER function
20. DAX NEXTYEAR function
21. DAX OPENINGBALANCEMONTH function
22. DAX OPENINGBALANCEQUARTER function
23. DAX OPENINGBALANCEYEAR function
24. DAX PARALLELPERIOD function
25. DAX PREVIOUSDAY function
26. DAX PREVIOUSMONTH function
27. DAX PREVIOUSQUARTER function
28. DAX PREVIOUSYEAR function
29. DAX SAMEPERIODLASTYEAR function
30. DAX STARTOFMONTH function
31. DAX STARTOFQUARTER function
32. DAX STARTOFYEAR function
33. DAX TOTALMTD function
34. DAX TOTALQTD function
35. DAX TOTALYTD function

DAX Date and Time Functions

These functions are based on the “datetime” data type of DAX and help us to create calculations based on it by taking values from a column as an argument. These are very similar to the Excel date and time functions. For example, DATEDIFF function returns the count of interval boundaries crossed between two dates. The list is as follows -

1. DAX CALENDAR function
2. DAX CALENDARAUTO function
3. DAX DATE function
4. DAX DATEDIFF function
5. DAX DATEVALUE function
6. DAX DAY function
7. DAX EDATE function
8. DAX EOMONTH function
9. DAX HOUR function
10. DAX MINUTE function
11. DAX MONTH function
12. DAX NOW function
13. DAX SECOND function
14. DAX TIME function
15. DAX TIMEVALUE function
16. DAX TODAY function
17. DAX WEEKDAY function
18. DAX WEEKNUM function
19. DAX YEAR function
20. DAX YEARFRAC function

DAX Information Functions

These functions look at the row or cell provided in an argument and let us know whether the value matches the expected type or not. For example, the ISBLANK function returns TRUE if the value that we referred is blank.

1. DAX CONTAINS function
2. DAX CUSTOMDATA function
3. DAX ISBLANK function
4. DAX ISERROR function
5. DAX ISEEMPTY function

6. DAX ISEVEN function
7. DAX ISLOGICAL function
8. DAX ISNONTEXT function
9. DAX ISNUMBER function
10. DAX ISODD function
11. DAX ISONORAFTER function
12. DAX ISTEXT function
13. DAX LOOKUPVALUE function
14. DAX USERNAME function

DAX Logical Functions

These functions act upon an expression and return information about values in an expression. For instance, DAX TRUE function tells us whether an expression that we are evaluating returns a TRUE value or not. Below is the list-

1. DAX AND function
2. DAX FALSE function
3. DAX IF function
4. DAX IFERROR function
5. DAX NOT function
6. DAX OR function
7. DAX SWITCH function
8. DAX TRUE function

DAX Math and Trig Functions

These functions are very similar to the Excel mathematical and trigonometric functions and help us to perform common mathematical calculations like sums, products, exponents, logarithms and trigonometric ratios. Following are the DAX Math and Trig functions –

1. DAX ABS function

2. DAX ACOS function
3. DAX ACOSH function
4. DAX ASIN function
5. DAX ASINH function
6. DAX ATAN function
7. DAX ATANH function
8. DAX CEILING function
9. DAX COMBIN function
10. DAX COMBINA function
11. DAX COS function
12. DAX COSH function
13. DAX CURRENCY function
14. DAX DEGREES function
15. DAX DIVIDE function
16. DAX EVEN function
17. DAX EXP function
18. DAX FACT function
19. DAX FLOOR function
20. DAX GCD function
21. DAX INT function
22. DAX ISO.CEILING function
23. DAX LCM function
24. DAX LN function
25. DAX LOG function
26. DAX LOG10 function
27. DAX MROUND function
28. DAX MOD function
29. DAX ODD function
30. DAX PERMUT function
31. DAX PI function
32. DAX POWER function

33. DAX QUOTIENT function
34. DAX RADIANS function
35. DAX RAND function
36. DAX RANDBETWEEN function
37. DAX ROUND function
38. DAX ROUNDDOWN function
39. DAX ROUNDUP function
40. DAX SIGN function
41. DAX SIN function
42. DAX SINH function
43. DAX SQRT function
44. DAX SQRTPI function
45. DAX TAN function
46. DAX TANH function
47. DAX TRUNC function

DAX Parent and Child Functions

These functions are useful to manage data having type as a parent/child hierarchy in their Data Models. Following are the DAX Parent and Child functions –

1. DAX PATH function
2. DAX PATHCONTAINS function
3. DAX PATHITEM function
4. DAX PATHITEMREVERSE function
5. DAX PATHLENGTH function

DAX Statistical Functions

The functions which are used to create aggregations like sums, averages, counts, variance, standard deviation etc are called DAX Statistical Functions and these are quite similar to the Excel Statistical functions. Following are the DAX Statistical functions –

1. DAX BETA.DIST function
2. DAX BETA.INV function
3. DAX CHISQ.DIST function
4. DAX CHISQ.DIST.RT function
5. DAX CHISQ.INV function
6. DAX CHISQ.INV.RT function
7. DAX CONFIDENCE.NORM function
8. DAX CONFIDENCE.T function
9. DAX EXPON.DIST function
10. DAX GEOMEAN function
11. DAX GEOMEANX function
12. DAX MEDIAN function
13. DAX MEDIANX function
14. DAX PERCENTILE.EXC function
15. DAX PERCENTILE.INC function
16. DAX PERCENTILEX.EXC function
17. DAX PERCENTILEX.INC function
18. DAX POISSON.DIST function
19. DAX RANK.EQ function
20. DAX RANKX function
21. DAX SAMPLE function
22. DAX STDEV.P function
23. DAX STDEV.S function
24. DAX STDEVX.P function
25. DAX STDEVX.S function
26. DAX VAR.P function

27. DAX VAR.S function
28. DAX VARX.P function
29. DAX VARX.S function
30. DAX XIRR function
31. DAX XNPV function

DAX Text Functions

These are the set of text functions which return part of a string, concatenate string values or search for text within a string. These work with tables and columns and also help us to set the formats for dates, times, and numbers.

1. DAX BLANK function
2. DAX CODE function
3. DAX CONCATENATE function
4. DAX CONCATENATEX function
5. DAX EXACT function
6. DAX FIND function
7. DAX FIXED function
8. DAX FORMAT function
9. DAX LEFT function
10. DAX LEN function
11. DAX LOWER function
12. DAX MID function
13. DAX REPLACE function
14. DAX REPT function
15. DAX RIGHT function
16. DAX SEARCH function
17. DAX SUBSTITUTE function
18. DAX TRIM function
19. DAX UPPER function
20. DAX VALUE function

DAX Other Functions

These DAX functions perform that unique actions that cannot be defined by any other functions of other categories. Following are the DAX Other functions –

1. DAX EXCEPT function
2. DAX GROUPBY function
3. DAX INTERSECT function
4. DAX NATURALINNERJOIN function
5. DAX NATURALLEFTOUTERJOIN function
6. DAX SUMMARIZECOLUMNS function
7. DAX UNION function
8. DAX VAR function

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