How do I use the MMULT function in Excel?

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The MMULT function in Excel is a built-in mathematical function that allows users to multiply two matrices together. It is typically used in data analysis and manipulation to perform various calculations and transformations on sets of data. To use the MMULT function, users must first input the two matrices they want to multiply into separate cells in Excel. Then, they can input the MMULT function into a designated cell and reference the cells containing the two matrices as its arguments. Once the function is entered, it will calculate and display the resulting matrix in the designated cell. The MMULT function is a useful tool for performing complex mathematical operations and can save users time and effort in data analysis.

The **MMULT** function returns the matrix product of two arrays. The result is an array with the same number of rows as array1 and the same number of columns as array2.

Note: If you have a current version of Microsoft 365, then you can simply enter the formula in the top-left-cell of the output range, then press **ENTER** to confirm the formula as a dynamic array formula. Otherwise, the formula must be entered as a legacy array formula by first selecting the output range, entering the formula in the top-left-cell of the output range, and then pressing **CTRL+SHIFT+ENTER** to confirm it. Excel inserts curly brackets at the beginning and end of the formula for you. For more information on array formulas, see Guidelines and examples of array formulas.

Syntax

MMULT(array1, array2)

The MMULT function syntax has the following arguments:

array1, array2 Required. The arrays you want to multiply.

Remarks

The number of columns in array1 must be the same as the number of rows in array2, and both arrays must contain only numbers.

Array1 and array2 can be given as cell ranges, array constants, or references.

MMULT returns the #VALUE! error when:

Any cells are empty or contain text.

The number of columns in array1 is different from the number of rows in array2.

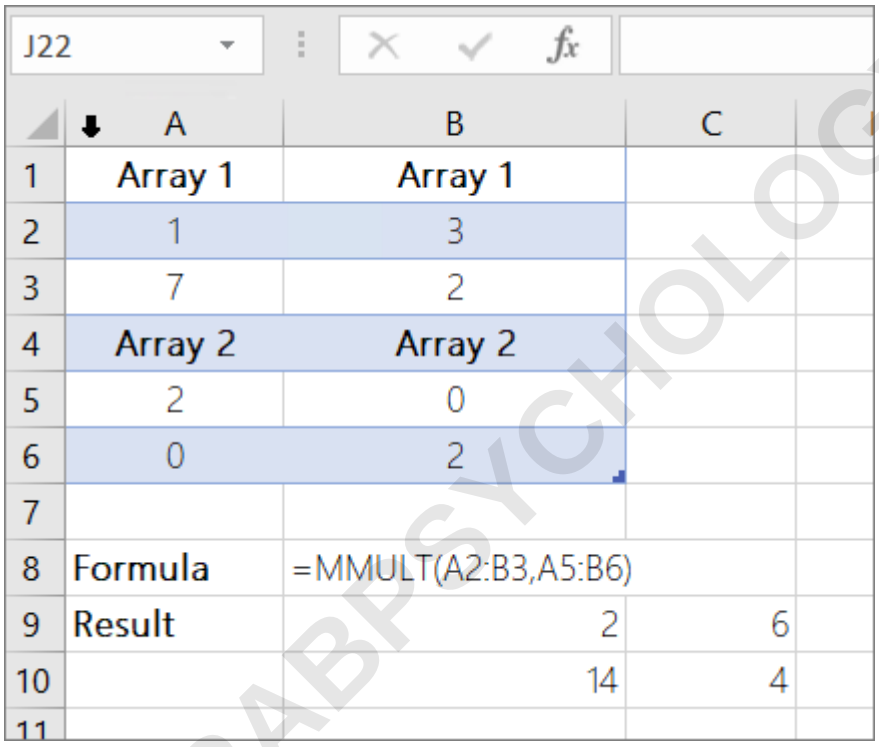
The matrix product array a of two arrays b and c is:

$$a_{ij} = \sum_{k=1}^{n} b_{ik} c_{kj}$$

where i is the row number, and j is the column number.

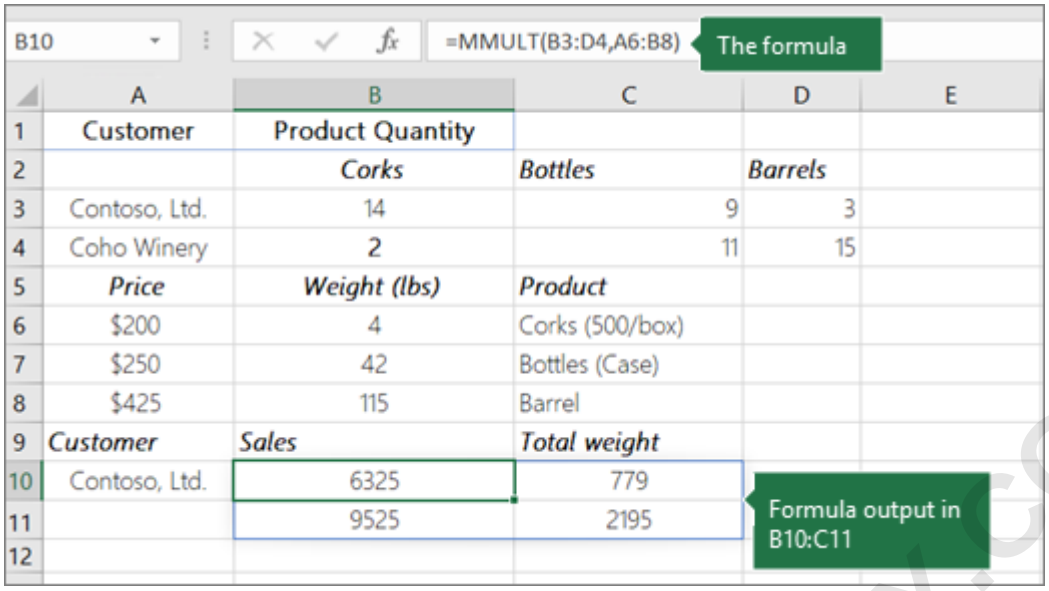
Examples

Example 1



	A	B	C
1	Array 1	Array 1	
2	1	3	
3	7	2	
4	Array 2	Array 2	
5	2	0	
6	0	2	
7			
8	Formula	=MMULT(A2:B3,A5:B6)	
9	Result	2	6
10		14	4
11			

Example 2



	A	B	C	D	E
1	Customer	Product Quantity			
2		*Corks*	*Bottles*	*Barrels*	
3	Contoso, Ltd.	14	9	3	
4	Coho Winery	2	11	15	
5	*Price*	*Weight (lbs)*	*Product*		
6	$200	4	Corks (500/box)		
7	$250	42	Bottles (Case)		
8	$425	115	Barrel		
9	*Customer*	*Sales*	*Total weight*		
10	Contoso, Ltd.	6325	779		
11		9525	2195		
12					

You must enter the above formulas as array formulas for it to work correctly. After you enter the formula, press **Enter** if you have a current Microsoft 365 subscription; otherwise press **Ctrl+Shift+Enter**. If the formula is not entered as an array formula, a single result is returned.