

How do I perform matrix multiplication in Google Sheets?

Authored by
stats writer

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Matrix multiplication is a mathematical operation that involves multiplying two matrices to obtain a new matrix. In Google Sheets, this can be done by using the MMULT function. To perform matrix multiplication in Google Sheets, you must first enter the matrices in two separate cells, making sure that the number of columns in the first matrix is equal to the number of rows in the second matrix. Then, in a third cell, use the MMULT function to multiply the two matrices. The resulting matrix will be displayed in the third cell. This function can be used for both square and non-square matrices, making it a useful tool for performing complex calculations in Google Sheets.

Perform Matrix Multiplication in Google Sheets

You can use the MMULT function in Google Sheets to perform matrix multiplication.

This function uses the following basic syntax:

MMULT(matrix1, matrix2)

where:

matrix1, matrix2: The two matrices you'd like to multiply.

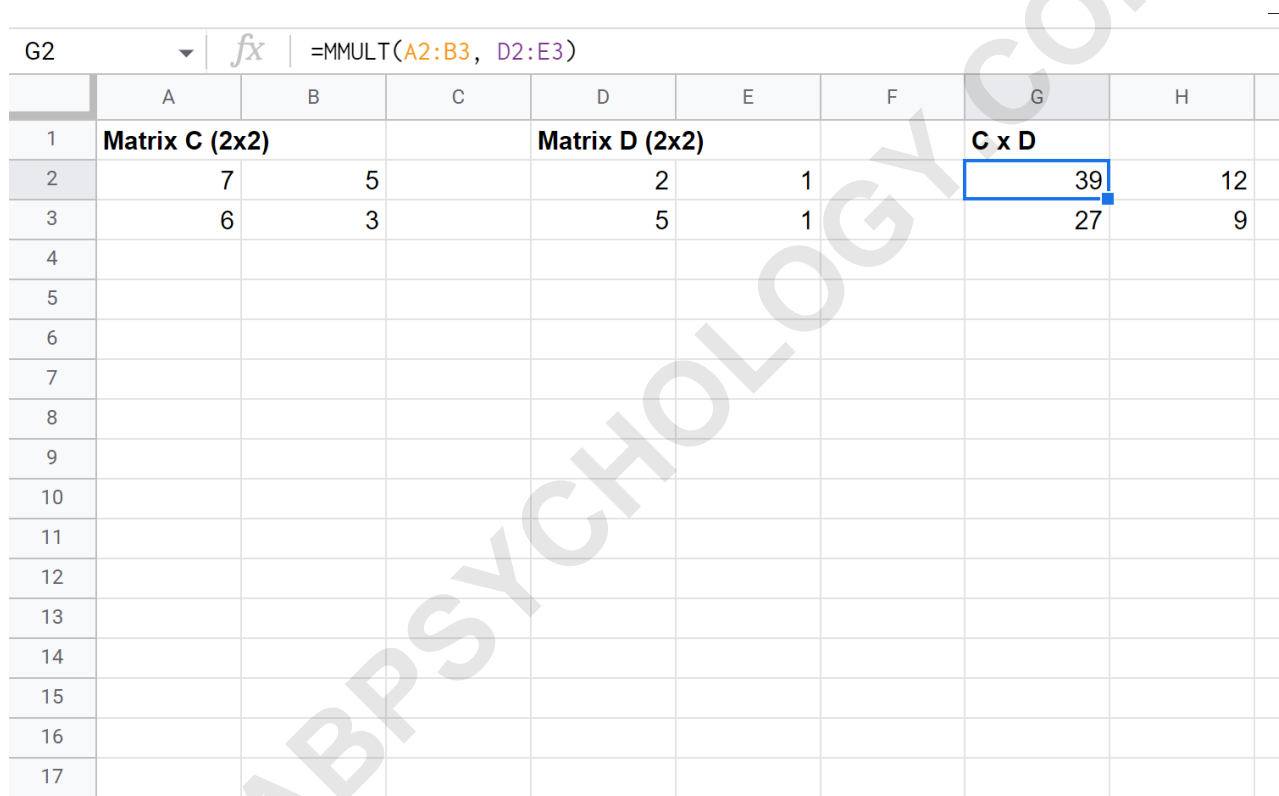
The following examples show how to use the MMULT function to perform the following matrix multiplications in Google Sheets:

(2×2) by (2×2) Matrix Multiplication (2×2) by (2×3) Matrix Multiplication (3×3) by (3×2) Matrix Multiplication

Let's jump in!

Example 1: (2x2) by (2x2) Matrix Multiplication

The following screenshot shows how to multiply a (2x2) matrix with another (2x2) matrix in Google Sheets:



	A	B	C	D	E	F	G	H
1	Matrix C (2x2)			Matrix D (2x2)			C x D	
2	7	5		2	1		39	12
3	6	3		5	1		27	9
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								

We typed the following formula in cell G2 to perform this matrix multiplication:

=MMULT(A2:B3, D2:E3)

Here are the actual formulas that Google Sheets used to

perform this matrix multiplication:

$$C \times D = \begin{bmatrix} 7*2 + 5*5 & 7*1 + 5*1 \\ 6*2 + 3*5 & 6*1 + 3*1 \end{bmatrix}$$

This results in the following 2x2 matrix:

$$C \times D = \begin{bmatrix} 39 & 12 \\ 27 & 9 \end{bmatrix}$$

Example 2: (2x2) by (2x3) Matrix Multiplication

The following screenshot shows how to multiply a (2x2) matrix with a (2x3) matrix in Google Sheets:

	A	B	C	D	E	F	G	H	I	J
H2	=MMULT(A2:B3, D2:F3)									
1	Matrix C (2x2)			Matrix D (2x3)				C x D		
2	7	5		2	1	4		39	12	38
3	6	3		5	1	2		27	9	30
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										

We typed the following formula in cell H2 to perform this matrix multiplication:

=MMULT(A2:B3, D2:F3)

Here are the actual formulas that Google Sheets used to perform this matrix multiplication:

$$C \times D = \begin{bmatrix} 7*2 + 5*5 & 7*1 + 5*1 & 7*4 + 5*2 \\ 6*2 + 3*5 & 6*1 + 3*1 & 6*4 + 3*2 \end{bmatrix}$$

This results in the following 2x3 matrix:

$$C \times D = \begin{bmatrix} 39 & 12 & 38 \\ 27 & 9 & 30 \end{bmatrix}$$

Example 3: (3x3) by (3x2) Matrix Multiplication

The following screenshot shows how to multiply a (3x3) matrix with a (3x2) matrix in Google Sheets:

	A	B	C	D	E	F	G	H	I
H2	=MMULT(A2:C4, E2:F4)								
1	Matrix C (3x3)				Matrix D (3x2)			C x D	
2	-3	5	4		2	1		19	-2
3	1	2	3		5	1		12	0
4	-1	0	2		0	-1		-2	-3
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

We typed the following formula in cell H2 to perform this matrix multiplication:

=MMULT(A2:C4, E2:F4)

Here are the actual formulas that Google Sheets used to perform this matrix multiplication:

$$C \times D = \begin{bmatrix} -3*2 + 5*5 + 4*0 & -3*1 + 5*1 + 4*-1 \\ 1*2 + 2*5 + 3*0 & 1*1 + 2*1 + 3*-1 \\ -1*2 + 0*5 + 2*0 & -1*1 + 0*1 + 2*-1 \end{bmatrix}$$

This results in the following 3x2 matrix:

$$C \times D = \begin{bmatrix} 19 & -2 \\ 12 & 0 \\ -2 & -3 \end{bmatrix}$$

Note: You can find the complete documentation for the MMULT function in Google Sheets .

The following tutorials explain how to perform other common tasks in Google Sheets: