How can I use the COVARIANCE.P function in Excel to calculate the covariance between two sets of data?

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The COVARIANCE.P function in Excel is a statistical tool that allows users to calculate the covariance between two sets of data. Covariance is a measure of the relationship between two variables, indicating how they change together. To use the COVARIANCE.P function, simply input the two sets of data as separate arguments, and the function will return the covariance value. This can be useful in assessing the strength and direction of the relationship between two variables, and can help in making predictions and analyzing data. The COVARIANCE.P function is a powerful tool for data analysis and can be easily used in Excel to calculate the covariance between two sets of data.

This article describes the formula syntax and usage of the **COVARIANCE.P** function in Microsoft Excel.

Returns population covariance, the average of the products of deviations for each data point pair in two data sets. Use covariance to determine the relationship between two data sets. For example, you can examine whether greater income accompanies greater levels of education.

Syntax

COVARIANCE.P(array1,array2)

The COVARIANCE.P function syntax has the following arguments:

Array1 Required. The first cell range of integers.

Array2 Required. The second cell range of integers.

Remarks

The arguments must either be numbers or be names, arrays, or references that contain numbers.

If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value zero are included.

If array1 and array2 have different numbers of data points, COVARIANCE.P returns the #N/A error value.

If either array1 or array2 is empty, COVARIANCE.P returns the #DIV/0! error value.

The covariance is:

$$Cov(X,Y) = \frac{\sum (x-\bar{x})(y-\bar{y})}{n}$$

where

$\bar{x}$ and $\bar{y}$

are the sample means AVERAGE(array1) and AVERAGE(array2), and n is the sample size.

Example

Copy the example data in the following table, and paste it in cell A1 of a new Excel worksheet. For formulas to show results, select them, press F2, and then press Enter. If you need to, you can adjust the column widths to see all the data.

Data1	**Data2**	
3	9	
2	7	
4	12	
5	15	
6	17	
Formula	**Description**	**Result**
=COVARIANCE.P(A2:A6, B2:B6)	Covariance, the average of the products of deviations for each data point pair above	5.2