

How do I calculate cross correlation in Excel?

Authored by
stats writer

June 22, 2024

RECOMMENDED CITATION

stats writer (2024). *How do I calculate cross correlation in Excel?*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=146956>

Cross correlation is a mathematical method used to measure the similarity between two time series data sets. In Excel, this can be done by using the CORREL function along with the data sets you want to compare. The output of this function will range from -1 to 1, with 1 indicating a perfect positive correlation, 0 indicating no correlation, and -1 indicating a perfect negative correlation. By calculating the cross correlation in Excel, you can gain insights into the relationship between two data sets and identify any patterns or trends that may exist. This can be useful in various fields such as statistics, finance, and engineering.

Calculate Cross Correlation in Excel

Cross correlation is a way to measure the degree of similarity between a time series and a lagged version of another time series.

This type of correlation is useful to calculate because it can tell us if the values of one time series are predictive of the future values of another time series.

In other words, it can tell us if one time series is a leading indicator for another time series.

The following example shows how to calculate the cross correlation between two time series in Excel.

Example: How to Calculate Cross Correlation in Excel

Suppose we have the following two time series in Excel that show the total marketing spend (in thousands) for a certain company along with the the total revenue (in

thousands) during 12 consecutive months:

	A	B	C	D	E	F
1	Marketing	Revenue				
2	3	21				
3	4	19				
4	5	22				
5	5	24				
6	7	25				
7	9	29				
8	13	30				
9	15	34				
10	12	37				
11	10	40				
12	8	35				
13	8	30				
14						
15						
16						
17						
18						
19						
20						

We can calculate the cross correlation for various lags between the two time series by typing the following formula into cell E2:

```
=CORREL(OFFSET(A$2:A$13,0,0,COUNT(A$2:A$13)-D2,1),OFFSET(B$2:B$13,D2,0,COUNT(B$2:B$13)-D2,1))
```

We can then click and drag this formula down to the remaining cells in column E:

E2 *fx* =CORREL(OFFSET(A\$2:A\$13,0,0,COUNT(A\$2:A

	A	B	C	D	E	F	G
1	Marketing	Revenue		Lag	Correlation		
2	3	21		0	0.7710936		
3	4	19		1	0.932281		
4	5	22		2	0.9534652		
5	5	24		3	0.7481677		
6	7	25		4	0.3521726		
7	9	29		5	0.0317806		
8	13	30					
9	15	34					
10	12	37					
11	10	40					
12	8	35					
13	8	30					
14							
15							
16							
17							
18							

From the output we can see:

The correlation at lag 0 (i.e. normal correlation between the two time series with no lag) is 0.77. The correlation at lag 1 is 0.93. The correlation at lag 2 is 0.95.

And so on.

Note that the correlation is highest with a lag value of 2 between the two time series.

The following tutorials explain how to perform other

common tasks in Excel:

ARABPSYCHOLOGY.COM