How can I calculate rolling correlation in Excel?

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To calculate rolling correlation in Excel, first select the data points for which you want to calculate the correlation. Then, use the CORREL function to calculate the correlation between these data points. Next, use the OFFSET function to create a rolling window of data points by specifying the number of data points and the starting point for each calculation. Finally, use the CORREL function again to calculate the rolling correlation between the rolling window of data points and the selected data points. Repeat this process for each desired rolling window to obtain a series of rolling correlation values.

Calculate Rolling Correlation in Excel

Rolling correlations are correlations between two time series on a rolling window. One benefit of this type of correlation is that you can visualize the correlation between two time series over time.

This tutorial explains how to calculate and visualize rolling correlations in Excel.

How to Calculate Rolling Correlations in Excel

Suppose we have the following two time series in Excel that display the total number of products sold for two different products during a 20-month period:

	A	B	C	D	E	F
1	**Month**	**Product 1**	**Product 2**			
2	1	13	22			
3	2	15	24			
4	3	16	23			
5	4	15	27			
6	5	17	26			
7	6	20	26			
8	7	22	27			
9	8	24	30			
10	9	25	33			
11	10	26	32			
12	11	23	27			
13	12	24	25			
14	13	23	28			
15	14	22	26			
16	15	20	28			
17	16	19	23			
18	17	18	19			
19	18	14	20			
20	19	14	22			
21	20	16	23			
22						
23						
24						
25						
26						

To calculate the 3-month rolling correlation between the two time series, we can simply use the CORREL() function in Excel. For example, here's how to calculate the first 3-month rolling correlation between the two time series:

	A	B	C	D	E	F	G
1	Month	Product 1	Product 2	Rolling 3-month correlation			
2	1	13	22				
3	2	15	24				
4	3	16	23	=CORREL(B2:B4, C2:C4)			
5	4	15	27				
6	5	17	26				
7	6	20	26				
8	7	22	27				
9	8	24	30				
10	9	25	33				
11	10	26	32				
12	11	23	27				
13	12	24	25				
14	13	23	28				
15	14	22	26				
16	15	20	28				
17	16	19	23				
18	17	18	19				
19	18	14	20				
20	19	14	22				
21	20	16	23				
22							
23							
24							
25							
26							
27							

We can then drag this formula down to the rest of the cells in the column:

	A	B	C	D	E	F	G
1	**Month**	**Product 1**	**Product 2**	**Rolling 3-month correlation**			
2	1	13	22				
3	2	15	24				
4	3	16	23	0.6547			
5	4	15	27	-0.6934			
6	5	17	26	-0.2402			
7	6	20	26	-0.8030			
8	7	22	27	0.8030			
9	8	24	30	0.9608			
10	9	25	33	0.9820			
11	10	26	32	0.6547			
12	11	23	27	0.8825			
13	12	24	25	0.8171			
14	13	23	28	-0.9449			
15	14	22	26	-0.3273			
16	15	20	28	-0.1890			
17	16	19	23	0.4336			
18	17	18	19	0.9979			
19	18	14	20	0.4539			
20	19	14	22	-0.7559			
21	20	16	23	0.7559			
22							
23							
24							
25							
26							

Each cell in the column titled "Rolling 3-month correlation" tells us the correlation between the two product sales for the previous 3 months.

Note that we could use a longer rolling time frame if we'd like as well. For example, we could instead calculate the rolling 6-month correlation:

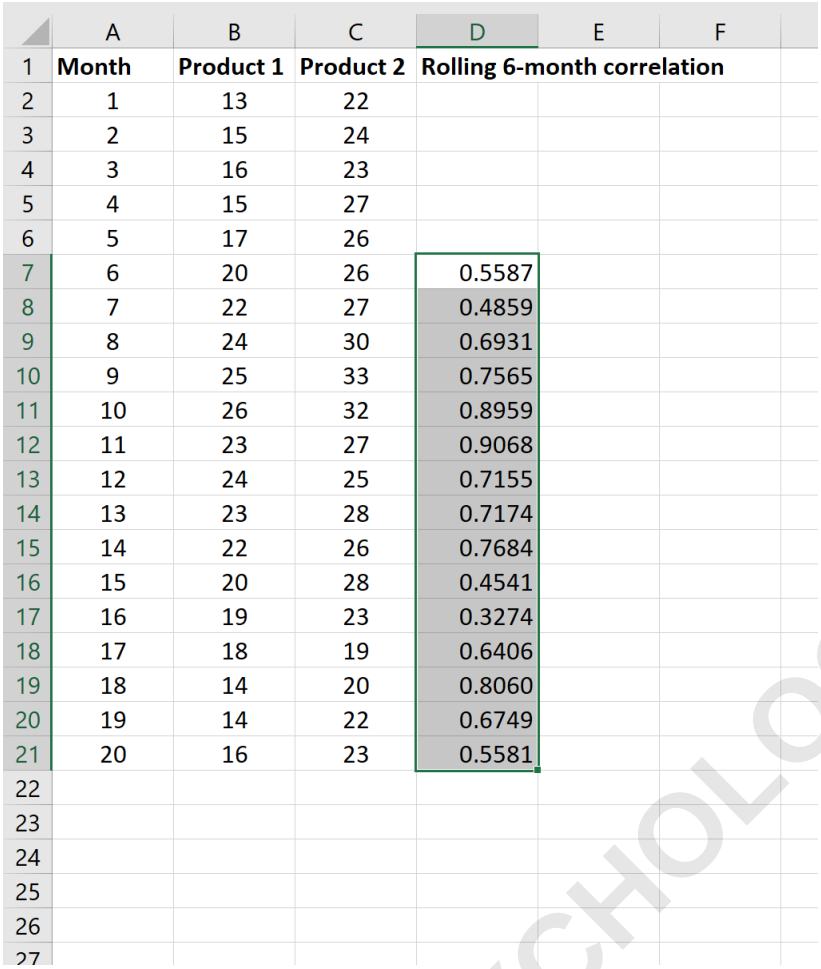
	A	B	C	D	E	F	G
1	Month	Product 1	Product 2	Rolling 6-month correlation			
2	1	13	22				
3	2	15	24				
4	3	16	23				
5	4	15	27				
6	5	17	26				
7	6	20	26	=CORREL(B2:B7, C2:C7)			
8	7	22	27	0.4859			
9	8	24	30	0.6931			
10	9	25	33	0.7565			
11	10	26	32	0.8959			
12	11	23	27	0.9068			
13	12	24	25	0.7155			
14	13	23	28	0.7174			
15	14	22	26	0.7684			
16	15	20	28	0.4541			
17	16	19	23	0.3274			
18	17	18	19	0.6406			
19	18	14	20	0.8060			
20	19	14	22	0.6749			
21	20	16	23	0.5581			
22							
23							
24							
25							
26							
27							

How to Visualize Rolling Correlations in Excel

Once we've calculate a rolling correlation between two time series, we can visualization the rolling correlation using a simple line chart. Use the following steps to do so:

Step 1: Highlight the rolling correlation values.

First, highlight the values in the cell range D7:D21.



	A	B	C	D	E	F
1	**Month**	**Product 1**	**Product 2**	**Rolling 6-month correlation**		
2	1	13	22			
3	2	15	24			
4	3	16	23			
5	4	15	27			
6	5	17	26			
7	6	20	26	0.5587		
8	7	22	27	0.4859		
9	8	24	30	0.6931		
10	9	25	33	0.7565		
11	10	26	32	0.8959		
12	11	23	27	0.9068		
13	12	24	25	0.7155		
14	13	23	28	0.7174		
15	14	22	26	0.7684		
16	15	20	28	0.4541		
17	16	19	23	0.3274		
18	17	18	19	0.6406		
19	18	14	20	0.8060		
20	19	14	22	0.6749		
21	20	16	23	0.5581		
22						
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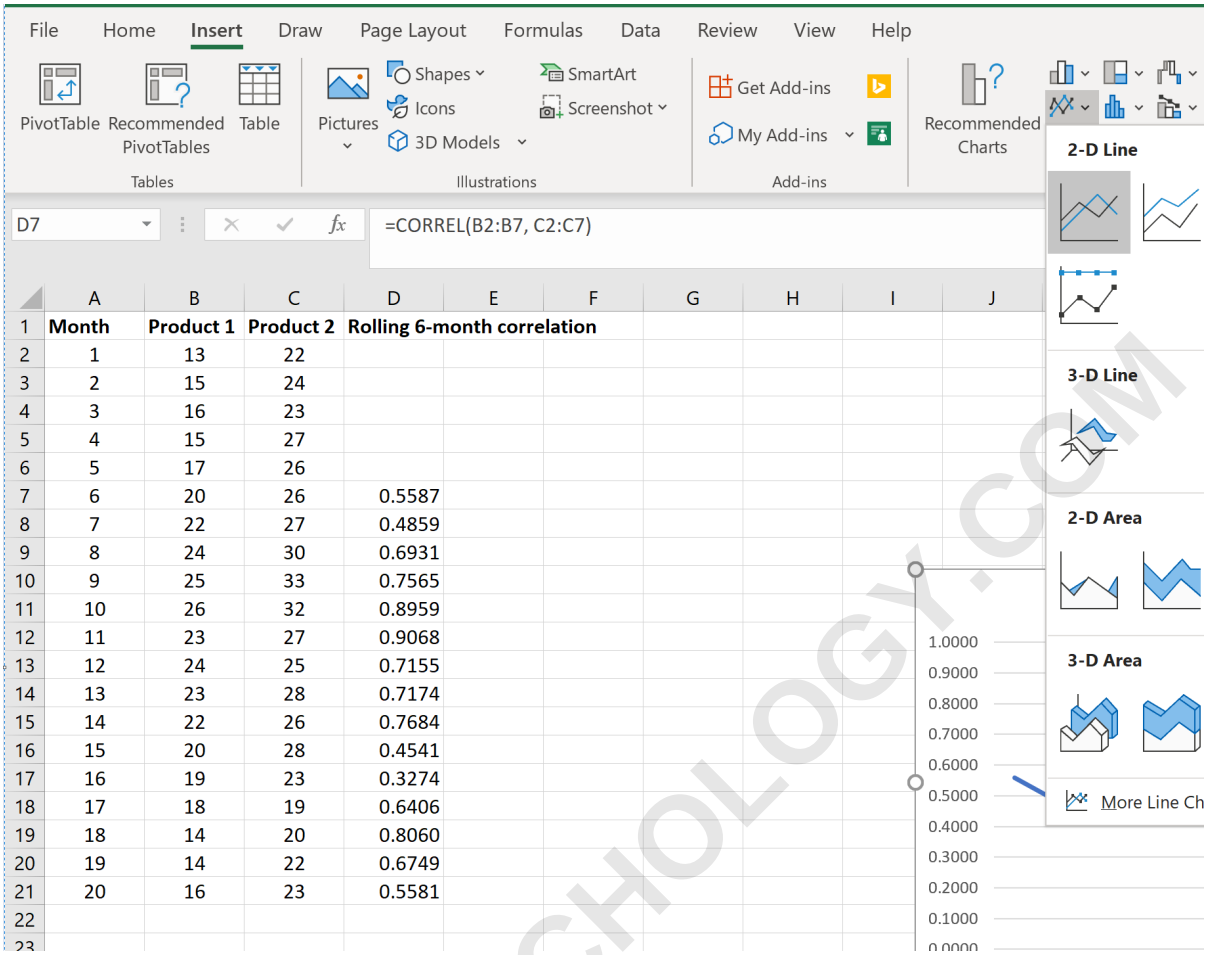
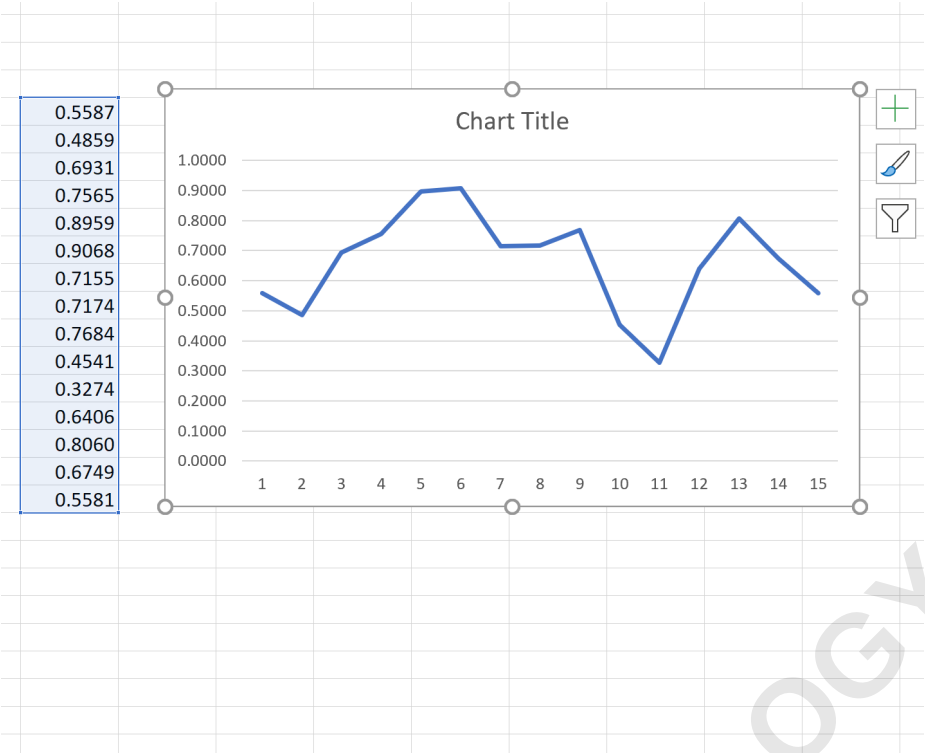
Next, click the Insert tab along the top ribbon in Excel. Within the Charts group, click on the first chart option in the Line or Area Chart section.



	A	B	C	D
1	**Month**	**Product 1**	**Product 2**	**Rolling 6-month correlation**
2	1	13	22	
3	2	15	24	
4	3	16	23	
5	4	15	27	
6	5	17	26	
7	6	20	26	0.5587
8	7	22	27	0.4859
9	8	24	30	0.6931
10	9	25	33	0.7565
11	10	26	32	0.8959
12	11	23	27	0.9068
13	12	24	25	0.7155
14	13	23	28	0.7174
15	14	22	26	0.7684
16	15	20	28	0.4541
17	16	19	23	0.3274
18	17	18	19	0.6406
19	18	14	20	0.8060
20	19	14	22	0.6749
21	20	16	23	0.5581
22				

The following line chart will automatically appear:



The y-axis displays the rolling 6-month correlation between the two time series and the x-axis displays the ending month for the rolling correlation.

Feel free to modify the title, axes labels, and colors to make the chart more aesthetically pleasing.

How to Create and Interpret a Correlation Matrix in Excel

How to Calculate Autocorrelation in Excel

How to Find the P-value for a Correlation Coefficient in Excel