How do I calculate an Exponential Moving Average in Excel?

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The process of calculating an Exponential Moving Average (EMA) in Excel involves using a mathematical formula to determine the average value of a set of data points over a specific time period. This moving average is weighted, giving more importance to recent data points and diminishing the impact of older data points. To calculate an EMA in Excel, you will need to input the relevant data points and use the EMA function or manually apply the formula. This method is commonly used in financial analysis and forecasting to smooth out fluctuations in data and identify trends. It is a useful tool for making informed decisions based on past data patterns.

Calculate an Exponential Moving Average in Excel

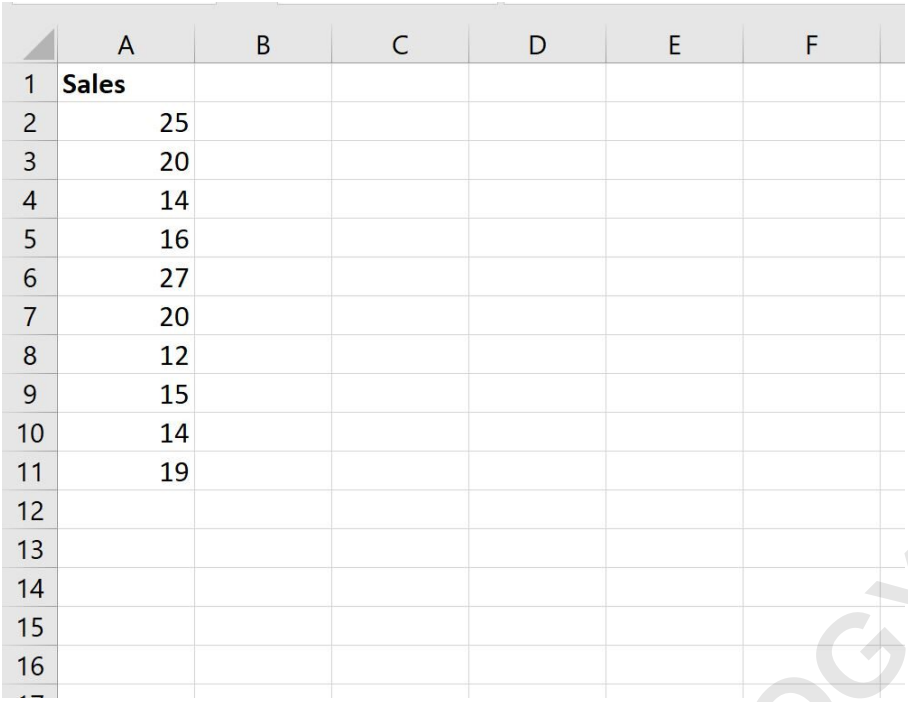
In time series analysis, a moving average is simply the average value of a certain number of previous periods.

An exponential moving average is a type of moving average that gives more weight to recent observations, which means it's able to capture recent trends more quickly.

The following step-by-step example shows how to calculate an exponential moving average in Excel

Step 1: Enter the Data

First, let's enter the following dataset that shows the total sales made by a company during 10 consecutive sales periods:



	A	B	C	D	E	F
1	**Sales**					
2	25					
3	20					
4	14					
5	16					
6	27					
7	20					
8	12					
9	15					
10	14					
11	19					
12						
13						
14						
15						
16						

Step 2: Calculate the Exponential Moving Average

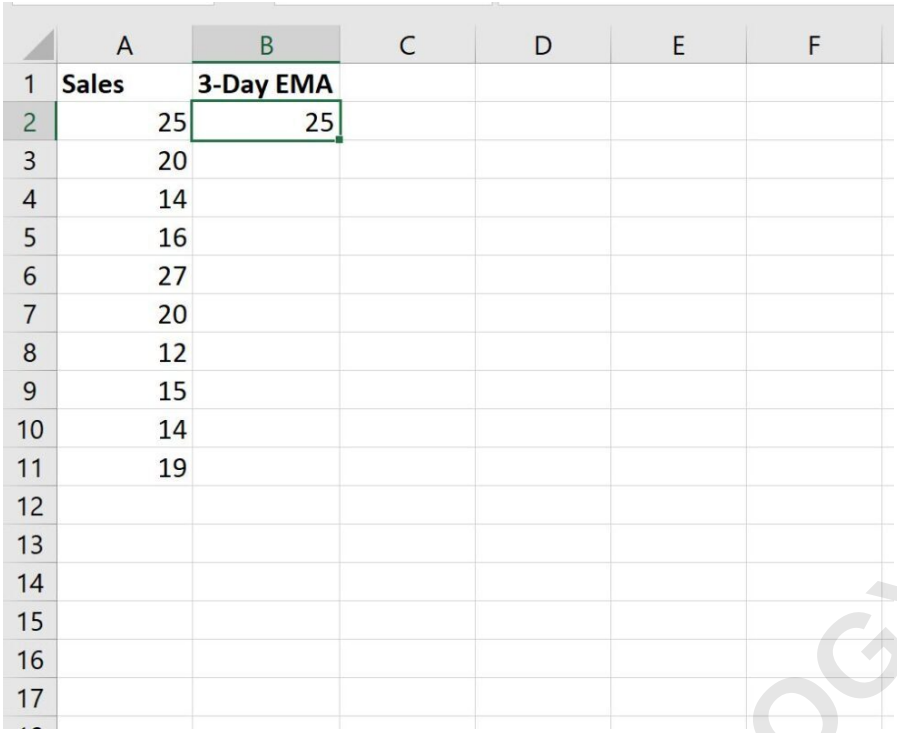
Next, we'll calculate the exponential moving average (EMA) using the following formula:

EMV = * (2/n+1) + Previous EMA

In the formula, n represents the number of periods to use to calculate the exponential moving average. This is the one number that you must specify.

For our example, we'll calculate a 3-day EMA.

First, we'll enter the EMA value in cell B2 to be equal to the value in cell A2:

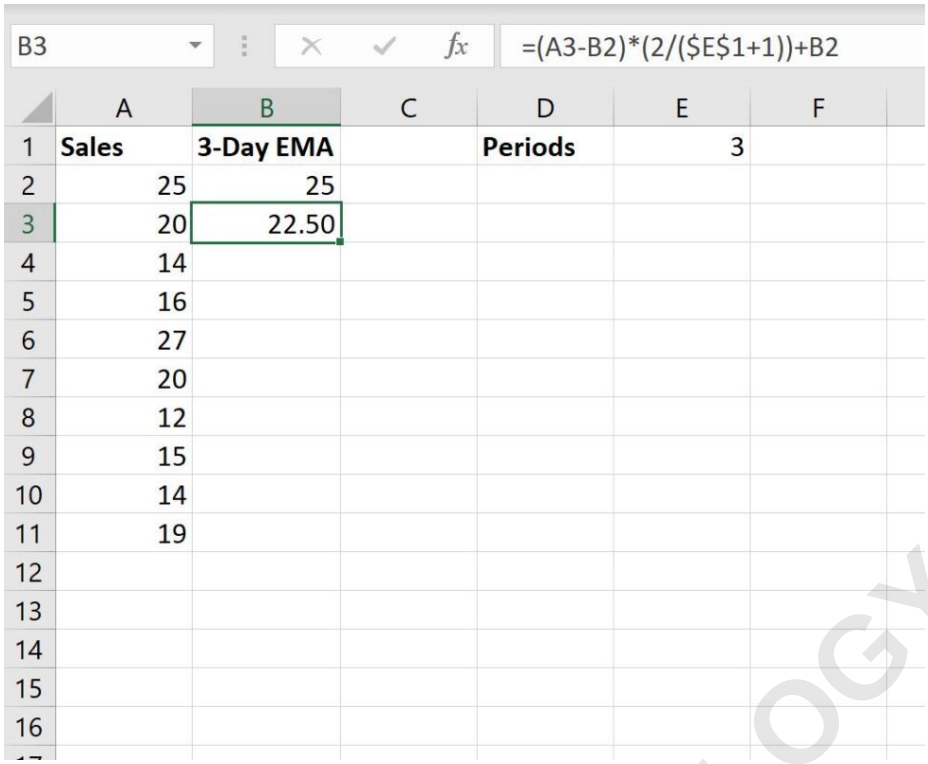


	A	B	C	D	E	F
1	Sales	3-Day EMA				
2	25	25				
3	20					
4	14					
5	16					
6	27					
7	20					
8	12					
9	15					
10	14					
11	19					
12						
13						
14						
15						
16						
17						

Next, we'll use the following formula to calculate the first value for the 3-day EMA:

=(A3-B2)*(2/(E1+1))+B2

The following screenshot shows how to use this formula in practice:



	A	B	C	D	E	F
1	**Sales**	**3-Day EMA**		**Periods**	3	
2	25	25				
3	20	22.50				
4	14					
5	16					
6	27					
7	20					
8	12					
9	15					
10	14					
11	19					
12						
13						
14						
15						
16						

	A	B	C	D	E	F
1	**Sales**	**3-Day EMA**		**Periods**	3	
2	25	25				
3	20	22.50				
4	14	18.25				
5	16	17.13				
6	27	22.06				
7	20	21.03				
8	12	16.52				
9	15	15.76				
10	14	14.88				
11	19	16.94				
12						
13						
14						
15						
16						
17						

Column B now shows the 3-day exponential moving

average of sales.

To calculate an exponential moving average using a different number of periods, simply change the value in cell E1.

For example, we could calculate the 4-day exponential moving average of sales instead by simply changing the value in cell E1 to 4:

	A	B	C	D	E	F
1	**Sales**	**4-Day EMA**		**Periods**	4	
2	25	25				
3	20	23.00				
4	14	19.40				
5	16	18.04				
6	27	21.62				
7	20	20.97				
8	12	17.38				
9	15	16.43				
10	14	15.46				
11	19	16.88				
12						
13						
14						
15						
16						
17						

Column B now shows the 4-day exponential moving average of sales.

Additional Resources

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