Moving Average and Weighted Moving Average Calculations

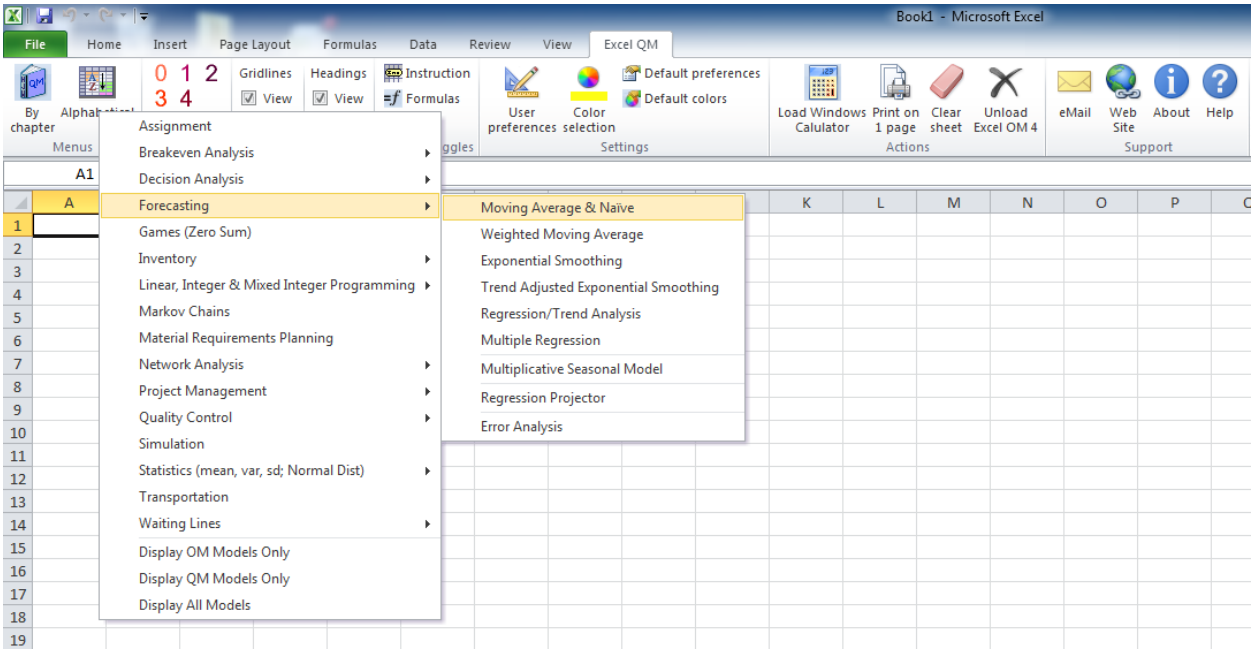
In this tutorial, we will be covering moving average and weighted moving average calculations.

Data collected on the yearly demand for 50-pound bags of fertilizer at Wallace Garden Supply are shown in the following table.

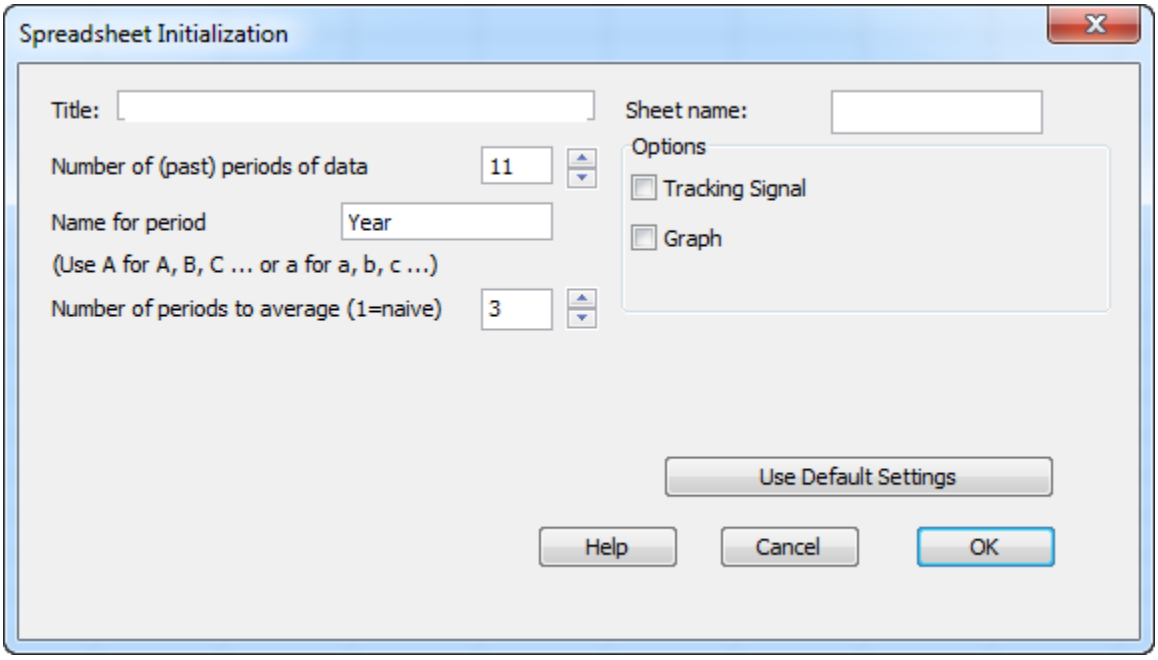
Data Table

Period	Demand for Fertilizer (1,000s bags)
Year 1	4
Year 2	6
Year 3	4
Year 4	5
Year 5	10
Year 6	8
Year 7	7
Year 8	9
Year 9	12
Year 10	14
Year 11	15

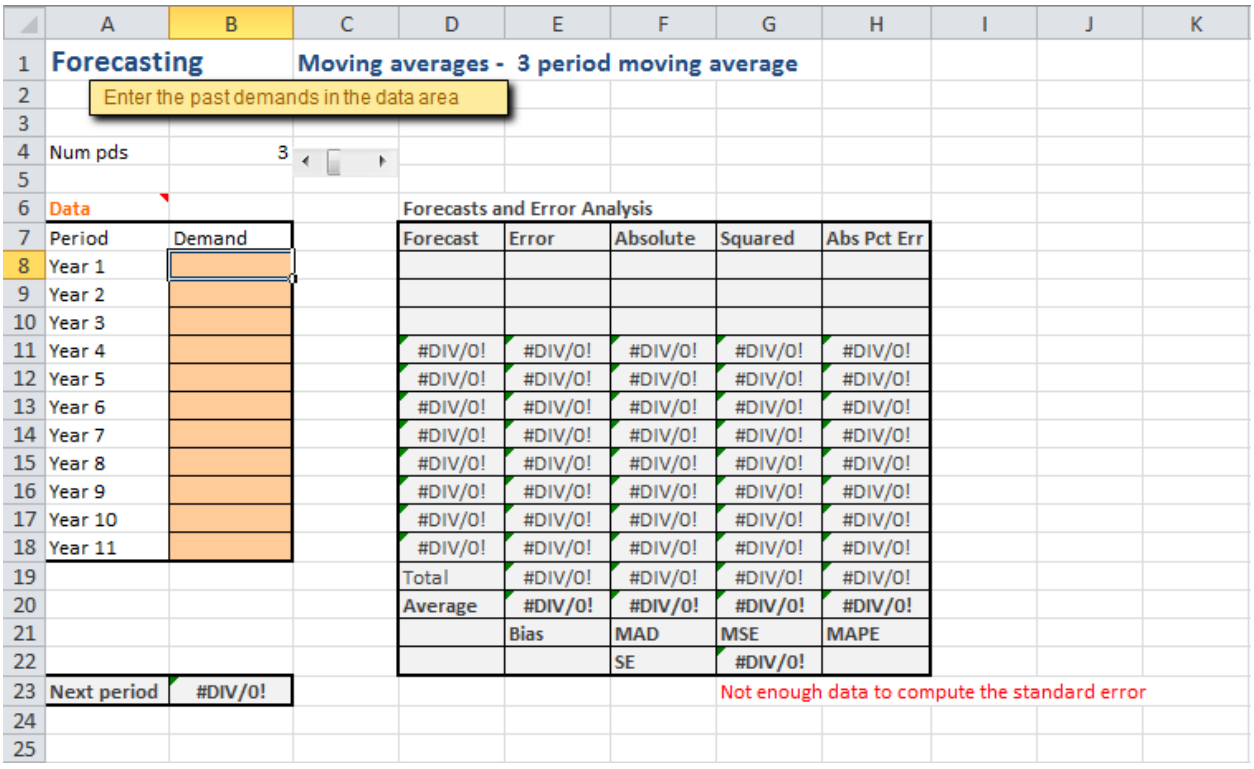
Develop a three year moving average to forecast sales. Then estimate demand again with a weighted moving average in which the sales in the most recent year are given a weight of 2, and sales in the other two years are given a weight of 1. Which method do you think is best? To solve this, open Excel QM, click on the **Excel QM** tab → **Alphabetical → Forecasting → Moving Average & Naive**.



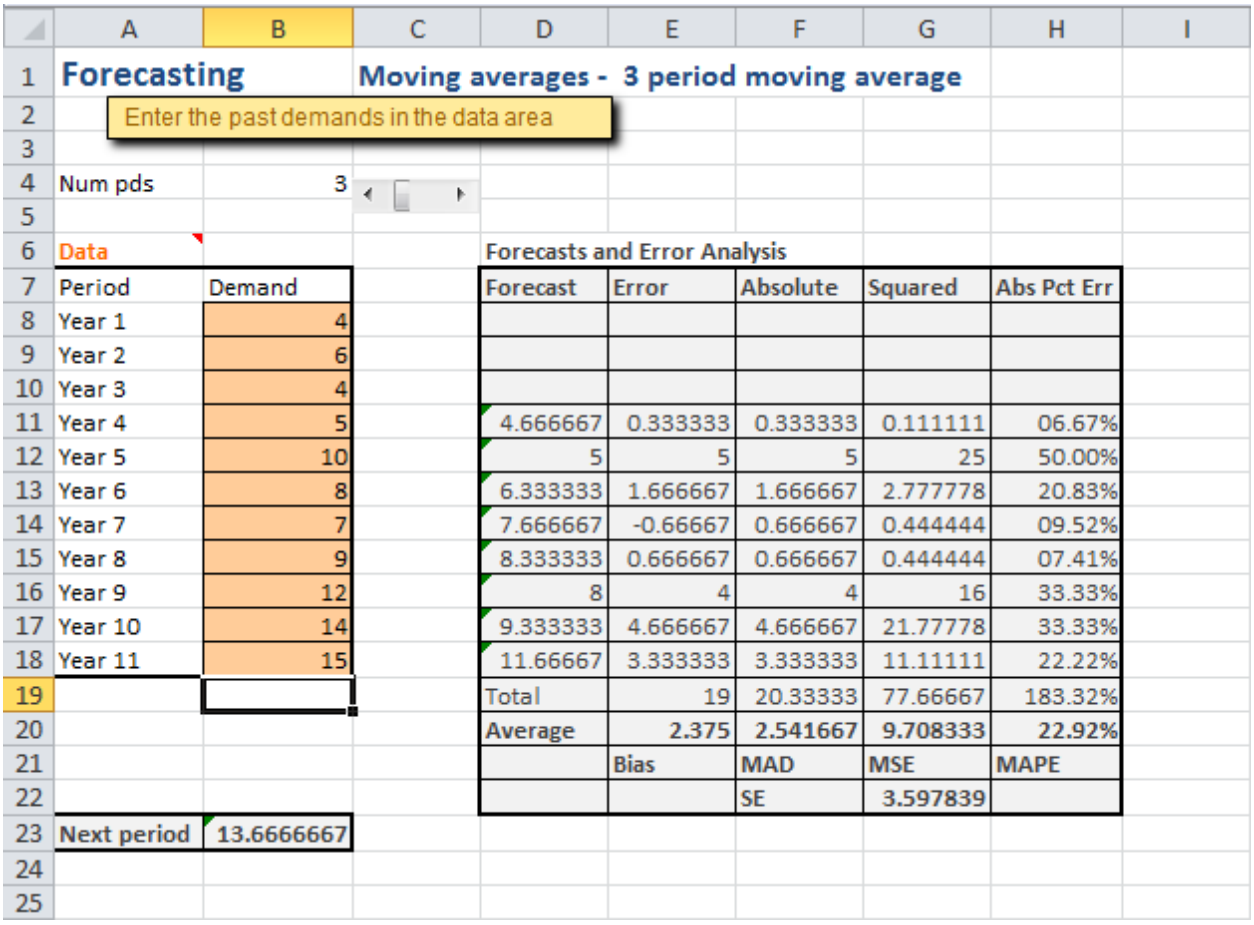
A Spreadsheet Initialization window will appear. In the **Number of (past) periods of data** box, enter 11, since the above data table shows 11 periods. For **Name for period**, type Year and the **Number of periods to average** is 3. Uncheck the box next to **Graph**.



Click **OK**.



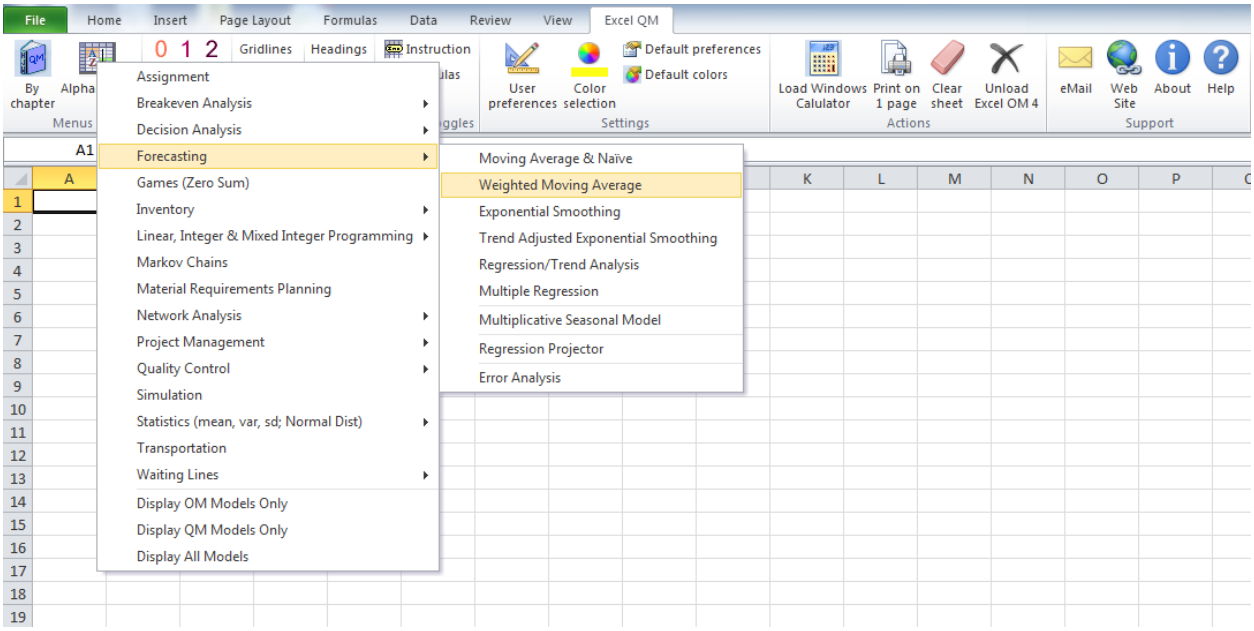
Now, in the Demand column of the spreadsheet, enter the demand information from the data table above and the moving average is already calculated.



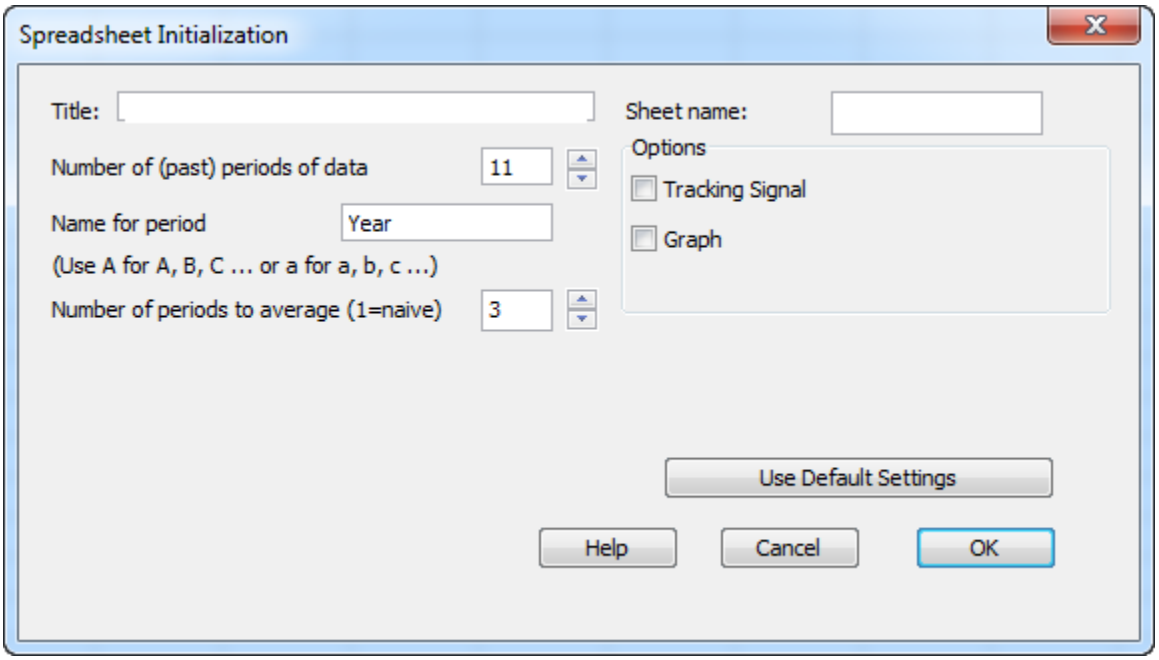
	A	B	C	D	E	F	G	H	I
1	**Forecasting**			**Moving averages - 3 period moving average**					
2		Enter the past demands in the data area							
3									
4	Num pds	3							
5									
6	Data			Forecasts and Error Analysis					
7	Period	Demand		Forecast	Error	Absolute	Squared	Abs Pct Err	
8	Year 1	4							
9	Year 2	6							
10	Year 3	4							
11	Year 4	5		4.666667	0.333333	0.333333	0.111111	06.67%	
12	Year 5	10		5	5	5	25	50.00%	
13	Year 6	8		6.333333	1.666667	1.666667	2.777778	20.83%	
14	Year 7	7		7.666667	-0.66667	0.666667	0.444444	09.52%	
15	Year 8	9		8.333333	0.666667	0.666667	0.444444	07.41%	
16	Year 9	12		8	4	4	16	33.33%	
17	Year 10	14		9.333333	4.666667	4.666667	21.77778	33.33%	
18	Year 11	15		11.66667	3.333333	3.333333	11.11111	22.22%	
19				Total	19	20.33333	77.66667	183.32%	
20				Average	2.375	2.541667	9.708333	22.92%	
21					Bias	MAD	MSE	MAPE	
22						SE	3.597839		
23	Next period	13.6666667							
24									
25									

You can see from the output that our forecast for the next period is simply 13.6667. You can also calculate this by hand by taking the average of the three prior periods (12, 14, 15). Click here if you would like to download and view the completed sample spreadsheet.

For calculating a weighted moving average the process is similar, but instead of selecting **Moving Average & Naive** from the forecasting menu, select **Weighted Moving Average**.



A Spreadsheet Initialization window will appear. Like before, in the **Number of (past) periods of data** box, enter 11; for **Name for period**, type Year and the **Number of periods to average** is 3. Uncheck the box next to **Graph**.



Click **OK**.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Forecasting		Weighted moving averages - 3 period moving average									
2	Enter the data in the shaded area. Enter weights in INCREASING order from top to bottom.											
3												
4												
5	Data				Forecasts and Error Analysis							
6	Period	Demand	Weights		Forecast	Error	Absolute	Squared	Abs Pct Err			
7	Period 1											
8	Period 2											
9	Period 3											
10	Period 4				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
11	Period 5				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
12	Period 6				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
13	Period 7				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
14	Period 8				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
15	Period 9				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
16	Period 10				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
17	Period 11				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
18					Total	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
19					Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
20						Bias	MAD	MSE	MAPE			
21							SE	#DIV/0!				
22	Next period	#DIV/0!						Not enough data to compute the standard error				
23												
24												
25												

Again, in the **Demand** column of the spreadsheet, enter the demand information from the data table above; in the **Weights** column of the spreadsheet, put in weights of 1, 1, and 2 going down from the top.

	A	B	C	D	E	F	G	H	I	J
1	Forecasting		Weighted moving averages - 3 period moving average							
2	Enter the data in the shaded area. Enter weights in INCREASING order from top to bottom.									
3										
4										
5	Data				Forecasts and Error Analysis					
6	Period	Demand	Weights		Forecast	Error	Absolute	Squared	Abs Pct Err	
7	Period 1	4	1							
8	Period 2	6	1							
9	Period 3	4	2							
10	Period 4	5			4.5	0.5	0.5	0.25	10.00%	
11	Period 5	10			5	5	5	25	50.00%	
12	Period 6	8			7.25	0.75	0.75	0.5625	09.38%	
13	Period 7	7			7.75	-0.75	0.75	0.5625	10.71%	
14	Period 8	9			8	1	1	1	11.11%	
15	Period 9	12			8.25	3.75	3.75	14.0625	31.25%	
16	Period 10	14			10	4	4	16	28.57%	
17	Period 11	15			12.25	2.75	2.75	7.5625	18.33%	
18					Total	17	18.5	65	169.36%	
19					Average	2.125	2.3125	8.125	21.17%	
20						Bias	MAD	MSE	MAPE	
21							SE	3.291403		
22	Next period	14								
23										
24										

You can see that the forecast for the next period is 14. Click here if you would like to download and view the completed sample spreadsheet. The weighted moving average tends to be more precise since you can weigh the more recent periods a little heavier than the older periods.

This concludes the tutorial on calculating moving averages and weighted moving averages.