How can multiple linear regression be used for predictive analysis in Excel?

Authored by

stats writer

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Multiple linear regression is a statistical technique that can be used in Excel for predictive analysis. It involves analyzing the relationship between multiple independent variables and a single dependent variable. By using this method, one can identify the most significant variables that influence the outcome and make predictions based on their values. The process involves creating a regression model, testing its accuracy, and using it to forecast future outcomes. With the help of Excel's built-in tools, users can easily perform multiple linear regression and use the results to make informed decisions and predictions. This approach is commonly used in various fields, such as finance, marketing, and economics, to forecast trends and patterns. It is an efficient and reliable method for predictive analysis in Excel, providing valuable insights and aiding in decision-making processes.

Excel: Use Multiple Linear Regression for Predictive Analysis

Often you may want to use a you've built in Excel to predict the response value of a new observation or data point.

Fortunately this is fairly easy to do and the following step-by-step example shows how to do so.

Step 1: Create the Data

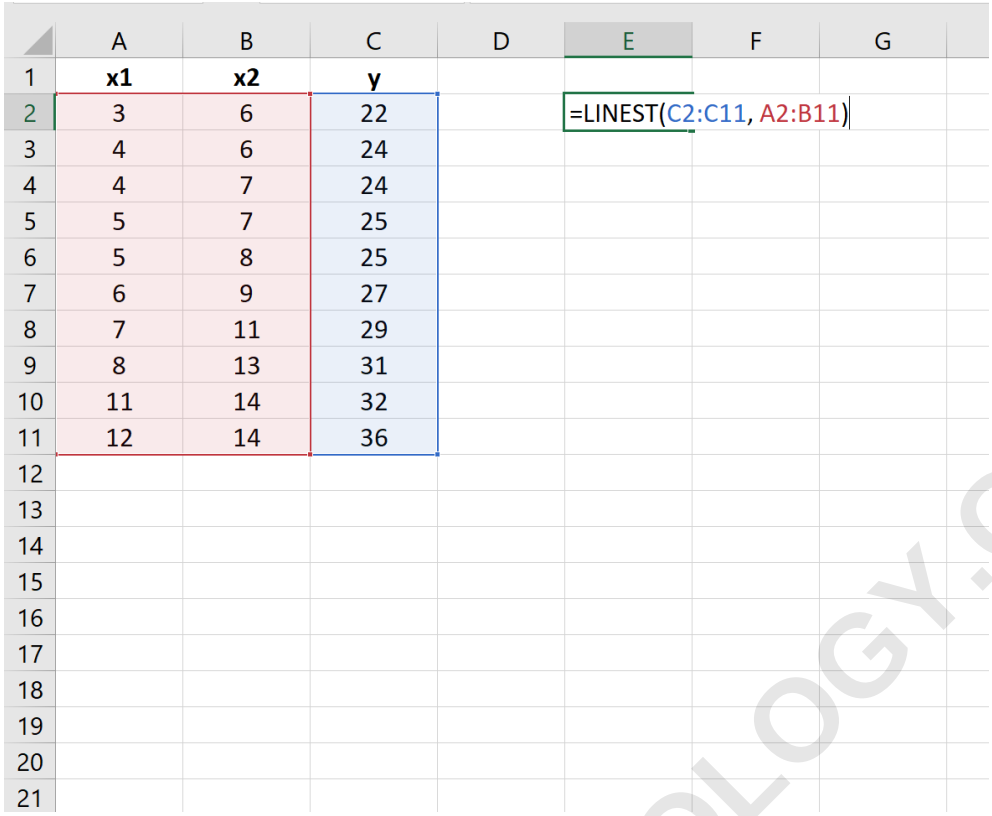
First, let's create a fake dataset to work with in Excel:

	A	B	C	D	E	F	G
1	**x1**	**x2**	**y**				
2	3	6	22				
3	4	6	24				
4	4	7	24				
5	5	7	25				
6	5	8	25				
7	6	9	27				
8	7	11	29				
9	8	13	31				
10	11	14	32				
11	12	14	36				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							

Step 2: Fit a Multiple Linear Regression Model

Next, let's fit a multiple linear regression model using x1 and x2 as predictor variables and y as the response variable.

To do so, we can use the LINEST(y_values, x_values) function as follows:



	A	B	C	D	E	F	G
1	**x1**	**x2**	**y**				
2	3	6	22		=LINEST(C2:C11, A2:B11)		
3	4	6	24				
4	4	7	24				
5	5	7	25				
6	5	8	25				
7	6	9	27				
8	7	11	29				
9	8	13	31				
10	11	14	32				
11	12	14	36				
12							
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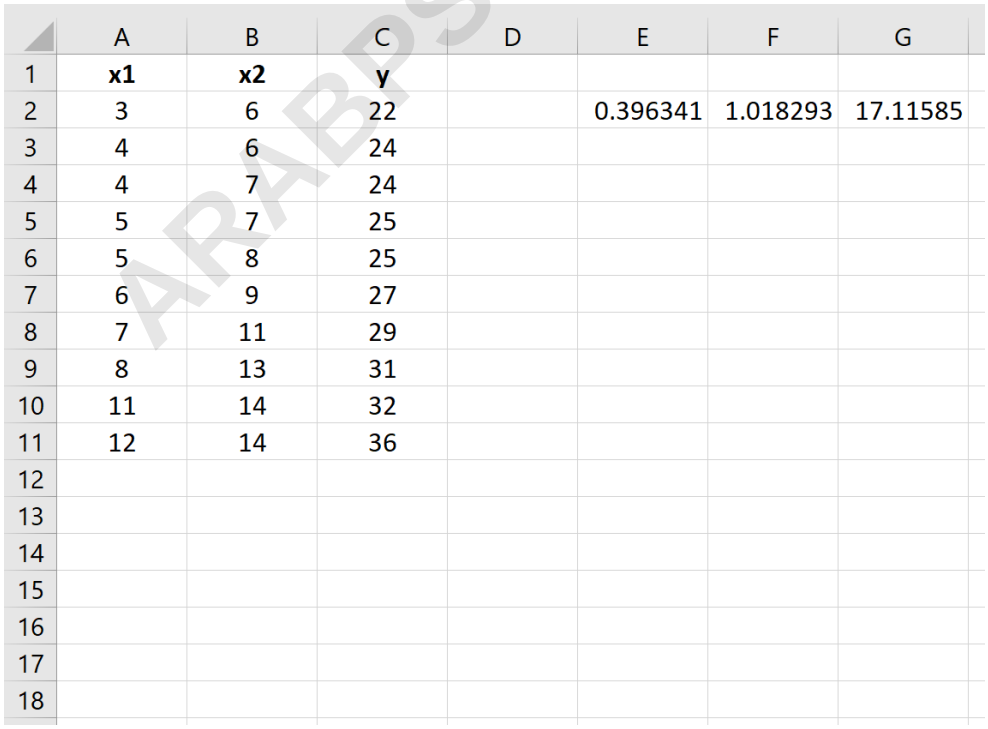
Once we click enter, the regression coefficients appear:



	A	B	C	D	E	F	G
1	**x1**	**x2**	**y**				
2	3	6	22		0.396341	1.018293	17.11585
3	4	6	24				
4	4	7	24				
5	5	7	25				
6	5	8	25				
7	6	9	27				
8	7	11	29				
9	8	13	31				
10	11	14	32				
11	12	14	36				
12							
13							
14							
15							
16							
17							
18							

The fitted multiple linear regression model is:

y = 17.1159 + 1.0183(x1) + 0.3963(x2)

Step 3: Use the Model to Predict a New Value

Now suppose that we'd like to use this regression model to predict the value of a new observation that has the following values for the predictor variables:

x1: 8x2: 10

To do so, we can use the following formula in Excel:

	A	B	C	D	E	F	G	H
1	**x1**	**x2**	**y**					
2	3	6	22		0.396341	1.018293	17.11585	
3	4	6	24					
4	4	7	24					
5	5	7	25					
6	5	8	25					
7	6	9	27					
8	7	11	29					
9	8	13	31					
10	11	14	32					
11	12	14	36					
12								
13	**New Data**							
14	**x1**	**x2**	**y**					
15	8	10	29.22561	=G2+F2*A15+E2*B15				
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

Using these values for the predictor variables, the multiple linear regression model predicts that the value for y will be 29.22561.

Step 4: Use the Model to Predict Several New Values

If we'd like to use the multiple linear regression model to predict the response value for several new observations, we can simply make absolute cell references to the regression coefficients:

	A	B	C	D	E	F	G
1	**x1**	**x2**	**y**				
2	3	6	22		0.396341	1.018293	17.11585
3	4	6	24				
4	4	7	24				
5	5	7	25				
6	5	8	25				
7	6	9	27				
8	7	11	29				
9	8	13	31				
10	11	14	32				
11	12	14	36				
12							
13	**New Data**						
14	**x1**	**x2**	**y**				
15	8	10	29.22561	=$G$2+$F$2*A15+$E$2*B15			
16	5	10	26.17073				
17	9	6	28.65854				
18	3	7	22.94512				
19	5	8	25.37805				
20							
21							
22							
23							
24							