

How do I calculate R-Squared in Excel and what are some examples?

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R-Squared, also known as the coefficient of determination, is a statistical measure used to determine the strength and relationship between two variables in a regression model. It is often used in data analysis to evaluate the effectiveness of a regression model in explaining the variability of the data points.

To calculate R-Squared in Excel, you can use the built-in function "RSQ" or the "Data Analysis" tool. The RSQ function requires two arrays of data, representing the x and y variables, and will return the R-Squared value. The Data Analysis tool allows you to perform a regression analysis and displays the R-Squared value in the output.

For example, if we have a dataset of monthly sales and advertising expenses, we can use R-Squared to determine the extent to which advertising expenses affect the sales. A high R-Squared value close to 1 indicates a strong positive relationship between the two variables, while a low value close to 0 indicates a weak or no relationship.

In another scenario, if we have a dataset of student's study hours and exam scores, we can use R-Squared to evaluate how well the study hours predict the exam scores. A high R-Squared value would indicate that the study hours are a good predictor of the exam scores.

In conclusion, calculating R-Squared in Excel can help us understand the strength and relationship between two variables in a regression model. It is a useful tool in data analysis and can provide valuable insights for decision making.

Calculate R-Squared in Excel (With Examples)

R-squared, often written as r^2 , is a measure of how well a fits a dataset.

In technical terms, it is the proportion of the variance in the response variable that can be explained by the predictor variable.

The value for r^2 can range from 0 to 1:

A value of 0 indicates that the response variable cannot be explained by the predictor variable at all. A value of 1 indicates that the response variable can be perfectly explained without error by the predictor variable.

This tutorial explains how to calculate r^2 for two variables in Excel.

Example: Calculating R-Squared in Excel

Suppose we have the following data for the number of hours studied and the exam score received for 20 students:

	A	B	C	D	E	F	G
1	hours	score					
2	1	76					
3	2	78					
4	2	85					
5	4	88					
6	2	72					
7	1	69					
8	5	94					
9	4	94					
10	2	88					
11	4	92					
12	4	90					
13	3	75					
14	6	96					
15	5	90					
16	3	82					
17	4	85					
18	6	99					
19	2	83					
20	1	62					
21	2	76					
22							
23							
24							
25							

Now suppose we are interested in fitting a simple linear regression model to this data, using "hours" as the predictor variable and "score" as the response variable.

To find the r^2 for this data, we can use the RSQ() function in Excel, which uses the following syntax:

=RSQ(known_ys, known_xs)

where:

known_ys: the values for the response variable
known_xs: the values for the predictor variable

Here's what that formula looks like in our example:

	A	B	C	D	E	F	G	H
1	hours	score		r^2	formula			
2	1	76		0.7273	=RSQ(B2:B21, A2:A21)			
3	2	78						
4	2	85						
5	4	88						
6	2	72						
7	1	69						
8	5	94						
9	4	94						
10	2	88						
11	4	92						
12	4	90						
13	3	75						
14	6	96						
15	5	90						
16	3	82						
17	4	85						
18	6	99						
19	2	83						
20	1	62						
21	2	76						
22								
23								
24								
25								
26								
27								

In this example, 72.73% of the variation in the exam scores can be explained by the number of hours studied.

D	E	F	G	H	I	J	K	L
SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.8528							
R Square	0.7273							
Adjusted R Square	0.7121							
Standard Error	5.2805							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1338.2906	1338.2906	47.9952	0.0000			
Residual	18	501.9094	27.8839					
Total	19	1840.2000						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	67.1617	2.6633	25.2178	0.0000	61.5664	72.7570	61.5664	72.7570
hours	5.2503	0.7578	6.9279	0.0000	3.6581	6.8424	3.6581	6.8424

Notice that the R Square value in the first table is 0.7273, which matches the result that we got using the RSQ() function.

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