How can I calculate the Standard Error of Regression in Excel?

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The Standard Error of Regression in Excel is a statistical measure used to estimate the accuracy of a regression line in predicting values for a dependent variable based on one or more independent variables. It is calculated by dividing the standard deviation of the residuals (the difference between the actual and predicted values) by the square root of the number of data points. In Excel, the standard error of regression can be calculated using the built-in function "STERR" or by using the formula "=STDEV(residuals)/SQRT(n-1)". This measure is important in determining the reliability and precision of a regression model and can aid in making informed decisions based on the data.

Calculate the Standard Error of Regression in Excel

Whenever we fit a , the model takes on the following form:

$Y = \beta 0 + \beta 1X + ... + \beta iX + ?$

where ? is an error term that is independent of X.

No matter how well X can be used to predict the values of Y, there will always be some random error in the model.

One way to measure the dispersion of this random error is by using the standard error of the regression model, which is a way to measure the standard deviation of ?.

This tutorial provides a step-by-step example of how to calculate the standard error of a regression model in Excel.

Step 1: Create the Data

For this example, we'll create a dataset that contains the following variables for 12 different students:

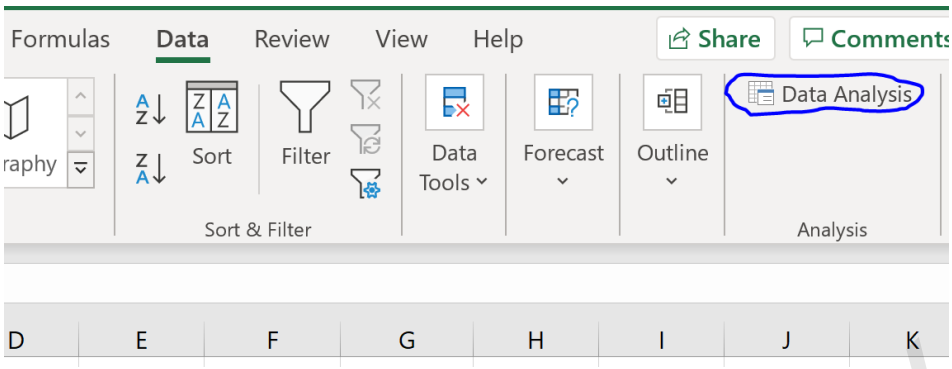
Exam ScoreHours Spent StudyingCurrent Grade

	A	B	C	D	E	F	G
1	**Exam Score**	**Study Hours**	**Current Grade**				
2	58	1	65				
3	61	1	78				
4	62	2	76				
5	65	2	76				
6	65	1	79				
7	68	2	80				
8	72	2	81				
9	74	3	84				
10	78	3	88				
11	85	4	85				
12	90	4	96				
13	95	5	90				
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Step 2: Fit the Regression Model

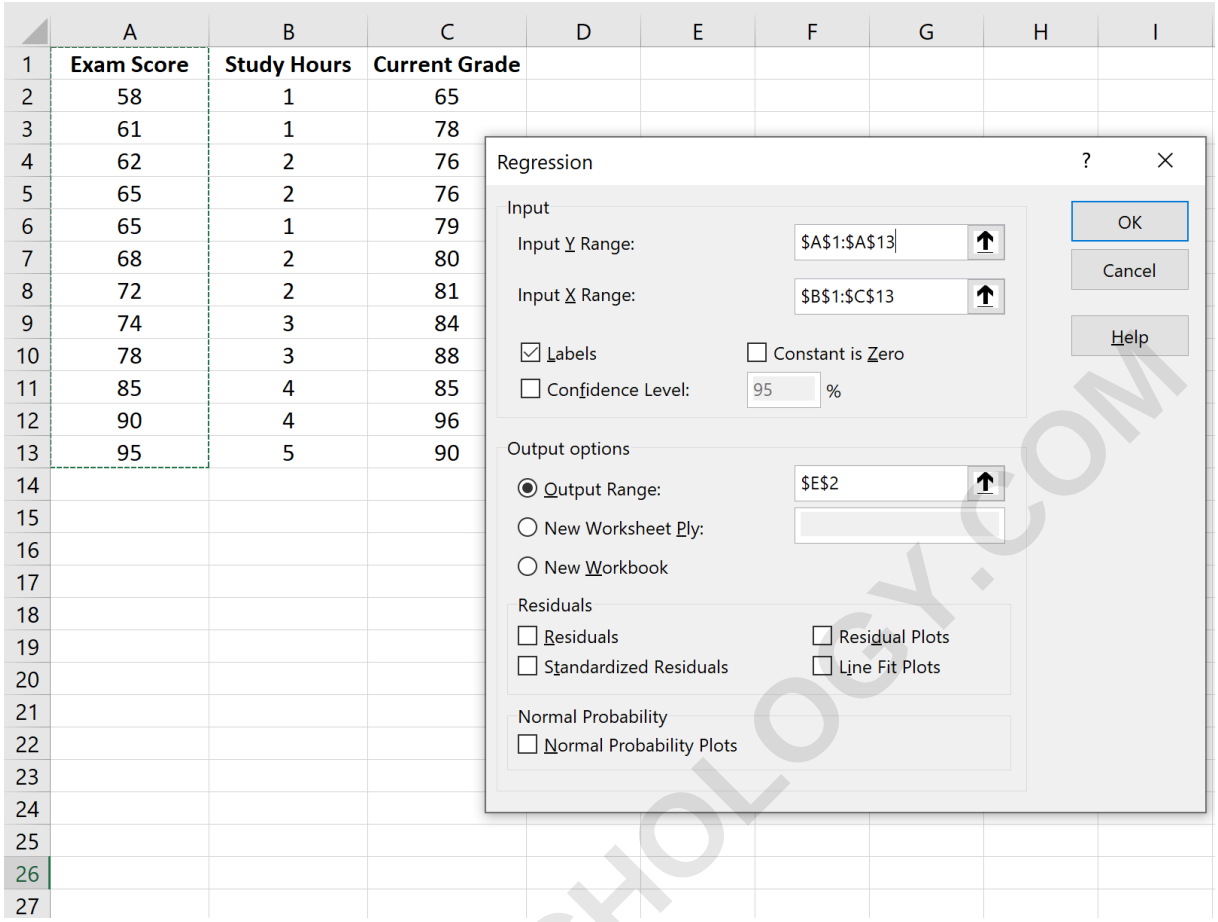
Next, we'll fit a model using *Exam Score* as the and *Study Hours* and *Current Grade* as the predictor variables.

To do so, click the Data tab along the top ribbon and then click Data Analysis:



If you don't see this option available, you need to first .

In the window that pops up, select Regression. In the new window that appears, fill in the following information:



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12	90	4	96
13	95	5	90

E	F	G	H	I	J	K	L	M
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.977668							
R Square	0.955834							
Adjusted R Square	0.946019							
Standard Error	2.790029							
Observations	12							
ANOVA								
	df	*SS*	*MS*	*F*	*ignificance F*			
Regression	2	1516.192	758.0958	97.3883	8E-07			
Residual	9	70.05834	7.78426					
Total	11	1586.25						
	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	17.17545	12.5562	1.367886	0.204527	-11.2286	45.57954	-11.2286	45.57954
Study Hours	6.383979	1.08675	5.874378	0.000236	3.92558	8.842378	3.92558	8.842378
Current Grade	0.486069	0.179428	2.708992	0.024037	0.080175	0.891963	0.080175	0.891963

Step 3: Interpret the Standard Error of Regression

The standard error of the regression model is the number next to Standard Error:

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The standard error of this particular regression model turns out to be 2.790029.

This number represents the average distance between the actual exam scores and the exam scores predicted by the model.

Note that some of the exam scores will be further than 2.79 units away from the predicted score while some will be closer. But, on average, the distance between the actual exam scores and the predicted scores is 2.790029.

Also note that a smaller standard error of regression indicates that a regression model fits a dataset more closely.

Thus, if we fit a new regression model to the dataset and ended up with a standard error of, say, 4.53, this new model would be worse at predicting exam scores than the previous model.

Another common way to measure the precision of a regression model is to use R-squared. Check out for a nice explanation of the benefits of using the standard error of the regression to measure precision compared to R-squared.