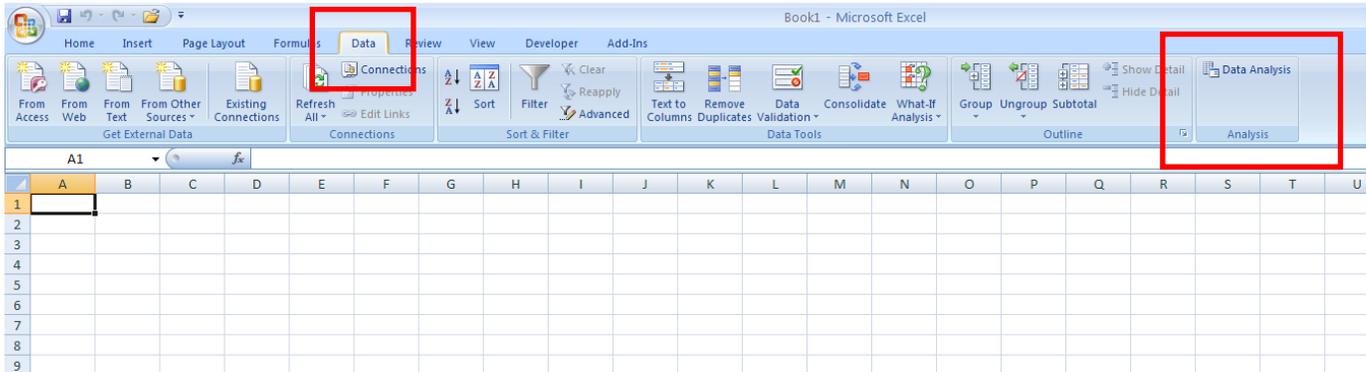


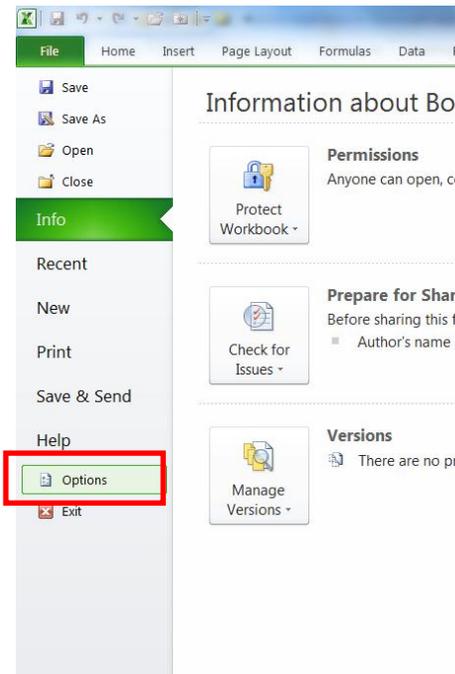
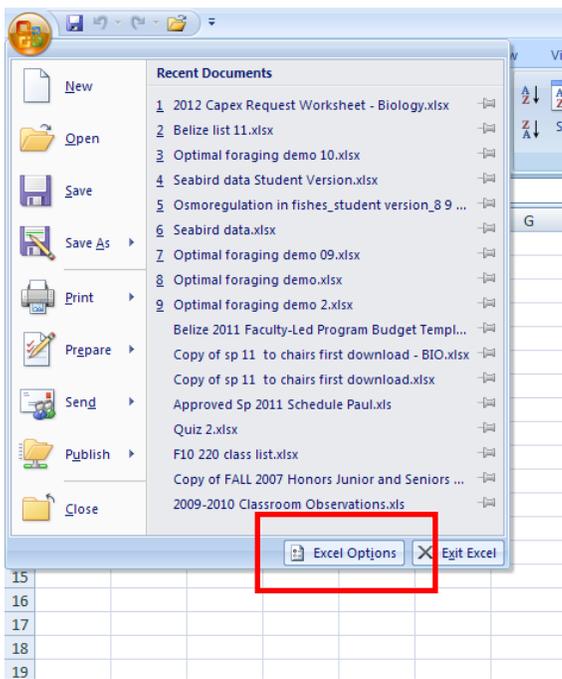
Calculating and displaying regression statistics in Excel

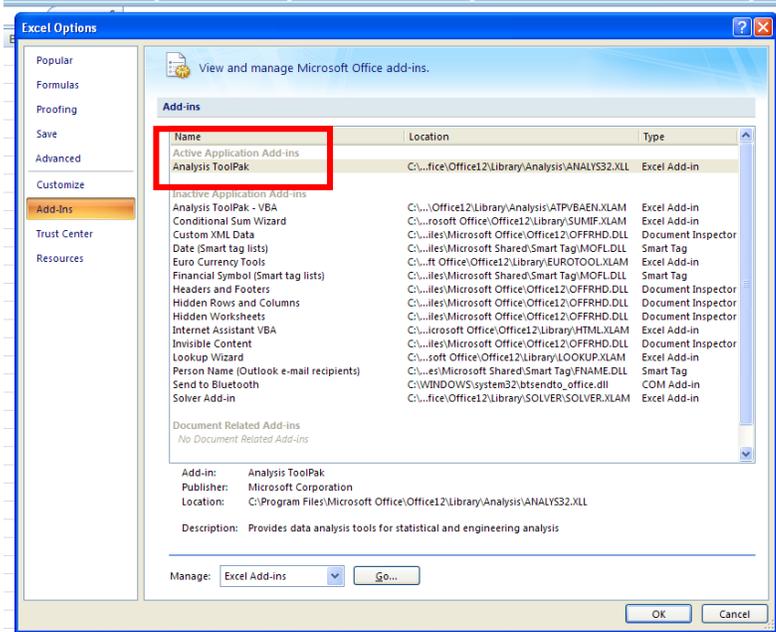
Note: the Analysis ToolPak is no longer included in Excel for the Mac. You need to download a third party analysis program to perform some statistical tests. These instructions apply to Excel for Windows.

You will need to have the *Data Analysis* add-in installed to your version of Excel to run statistical tests. If you click on the “Data” menu tab and see the “Data Analysis” option as below, then the add-in is already installed.



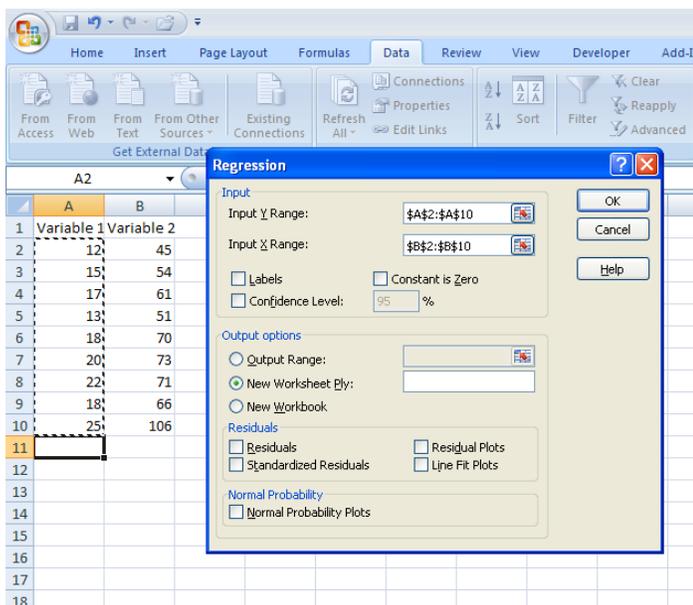
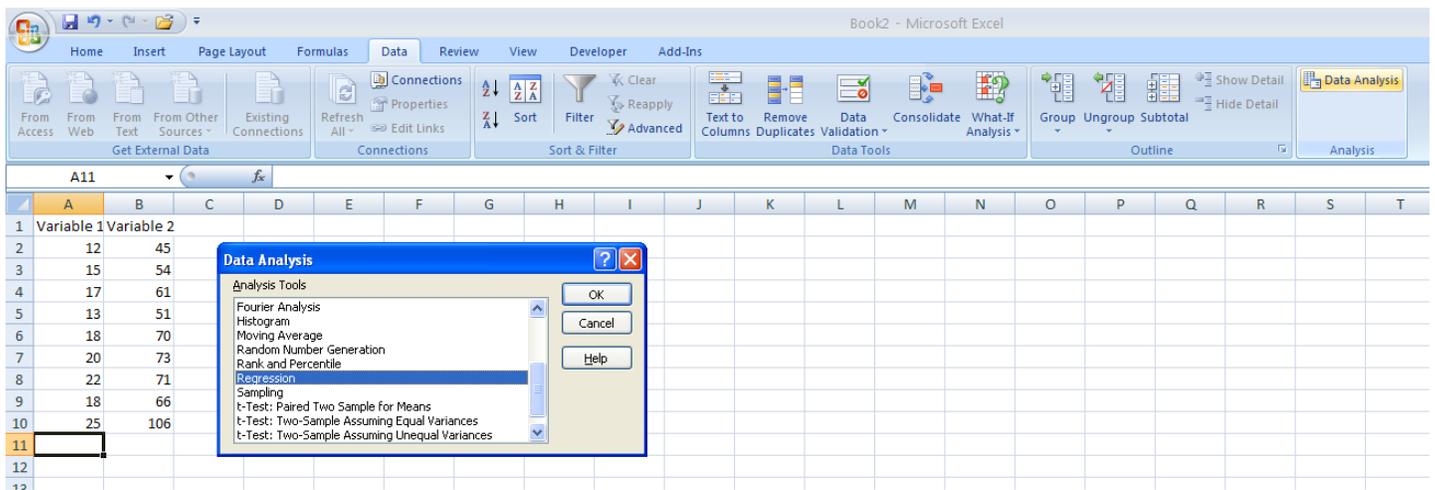
If you do not see the “Data Analysis” option, you will need to install the add-in. Depending on the version of Excel you are using, you do this by clicking on the Office button in the top left corner, and selecting the “Excel Options” button (below left), or clicking on the “File” tab and then the “options” button (below right).





You will then see the Excel Options menu (left): click on the “Add-Ins” button and select the “Analysis ToolPak” and click the “Go” button to install. The “Data Analysis” tab should then appear in the “Data” menu as shown above

To run the regression, arrange your data in columns as seen below. Click on the “Data” menu, and then choose the “Data Analysis” tab. You will now see a window listing the various statistical tests that Excel can perform. Scroll down to find the regression option and click “OK”.

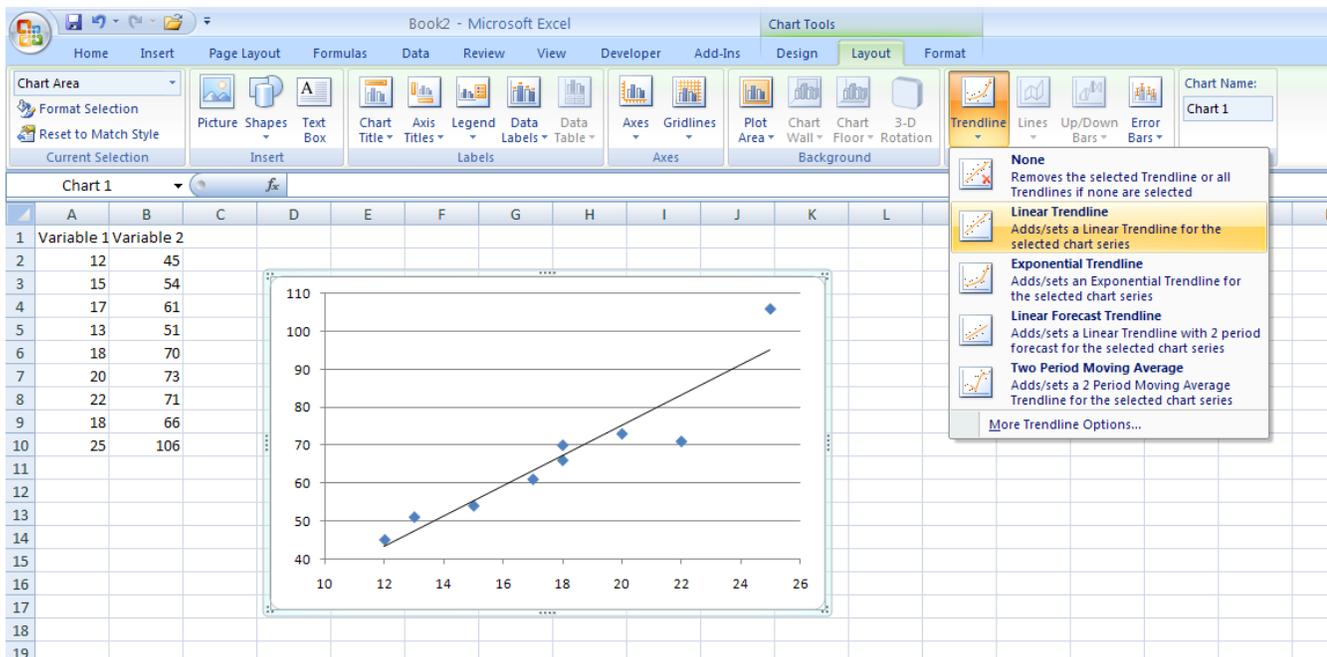


Now input the cells containing your data. In the menu box, click in the “Input Y Range” box and then use the cursor to select the column containing the data for the dependent variable. As you select the cells in your spreadsheet, the range should also appear in the menu box window. Repeat the process for “Input X Range” and your independent variable data. When everything looks good, click “OK”. You will now see the results of your statistical test (unless you selected otherwise, by default the results will open in a new worksheet).

SUMMARY OUTPUT					
<i>Regression Statistics</i>					
Multiple R	0.93794				
R Square	0.87974				
Adjusted R Square	0.86256				
Standard Error	1.54841				
Observations	9				
<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>gnificance F</i>
Regression	1	122.772	122.772	51.2068	0.00018
Residual	7	16.7831	2.39758		
Total	8	139.556			
<i>Coefficients</i>					
	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	3.148	2.10858	1.49295	0.17909	-1.838 8.13401
X Variable 1	0.22055	0.03082	7.1559	0.00018	0.14767 0.29343

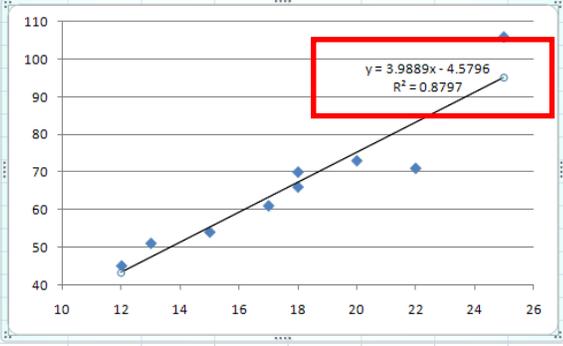
Among the variables that appear in the results sheet (left), depending on your experiment the most important result is the R square value, highlighted at left in the pink cell. You then report the R^2 value in your text when you describe your statistical results. If you include a figure showing your regression analysis, you should also include this value in the figure. Steps for doing this appear below.

You can also see the p-value (in red box) indicating whether or not the test is statistically significant (i.e. if $p < 0.05$). In this example, the p-value is 0.00018.



Create your regression curve by making a scatter plot. Add the regression line by choosing the “Layout” tab in the “Chart Tools” menu. Then select “Trendline” and choose the “Linear Trendline” option, and the line will appear as shown above. To add the line equation and the R^2 value to your figure, under the “Trendline” menu select “More Trendline Options” to see the “Format Trendline” window shown below. Select the boxes next to “Display equation on chart” and “Display R-squared value on chart” and you are all set. (Note that you do not need to go through the “Data Analysis” steps above to calculate your R^2 value if you use this method – Excel will do that automatically).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Variable 1	Variable 2																
2		12	45															
3		15	54															
4		17	61															
5		13	51															
6		18	70															
7		20	73															
8		22	71															
9		18	66															
10		25	106															



Format Trendline

Trendline Options

Line Color, Line Style, Shadow

Trend/Regression Type

- Exponential
- Linear
- Logarithmic
- Polynomial Order: 2
- Power
- Moving Average Period: 2

Trendline Name

Automatic: Linear (Series1)

Custom: []

Forecast

Forward: 0.0 periods

Backward: 0.0 periods

Set intercept = 0.0

Display Equation on chart

Display R-squared value on chart

Close