Linear Regression using Excel

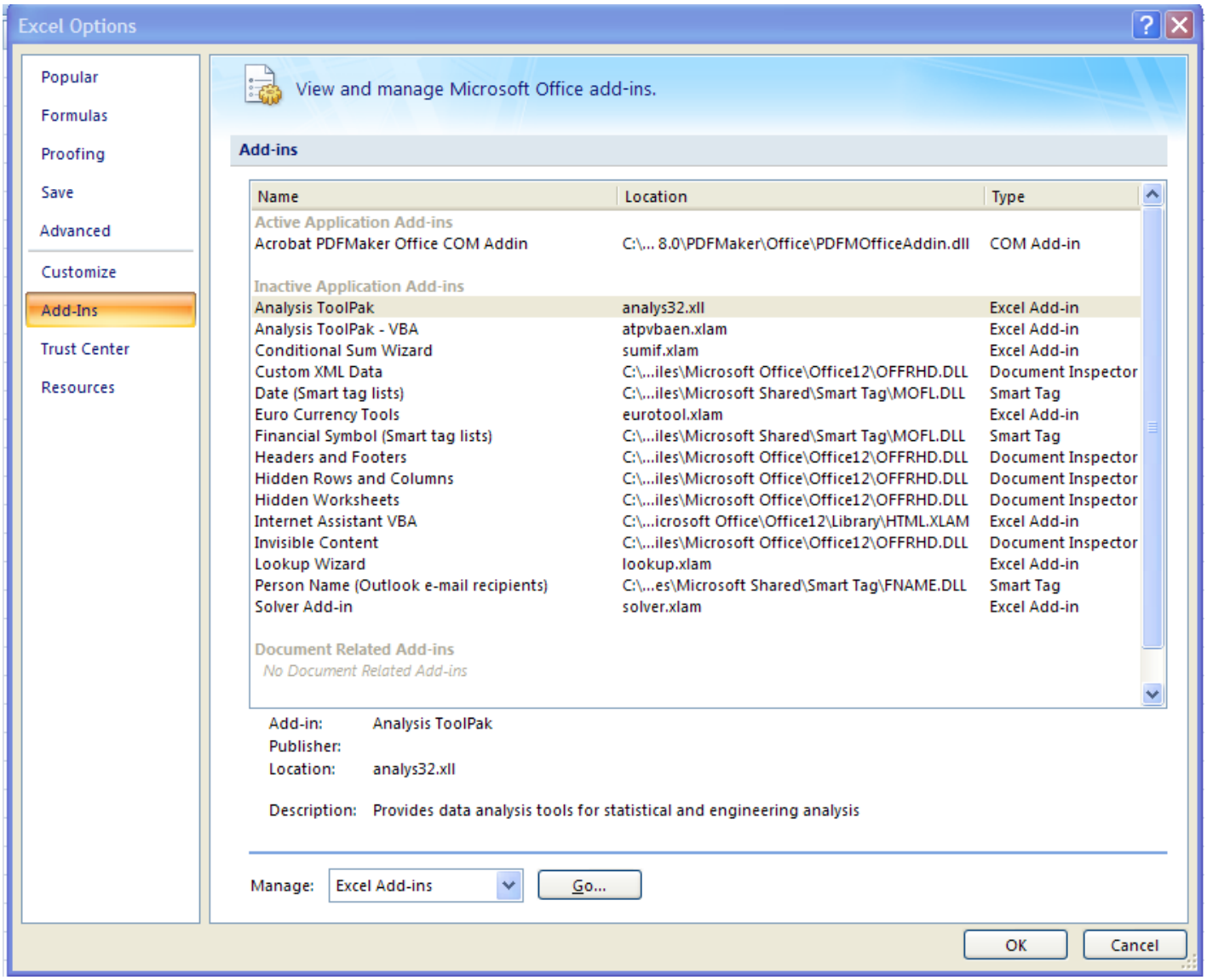
Subject: Linear Regression using Excel

Application: Microsoft Excel 2007

Task: I want to find a linear equation that best describes a data set

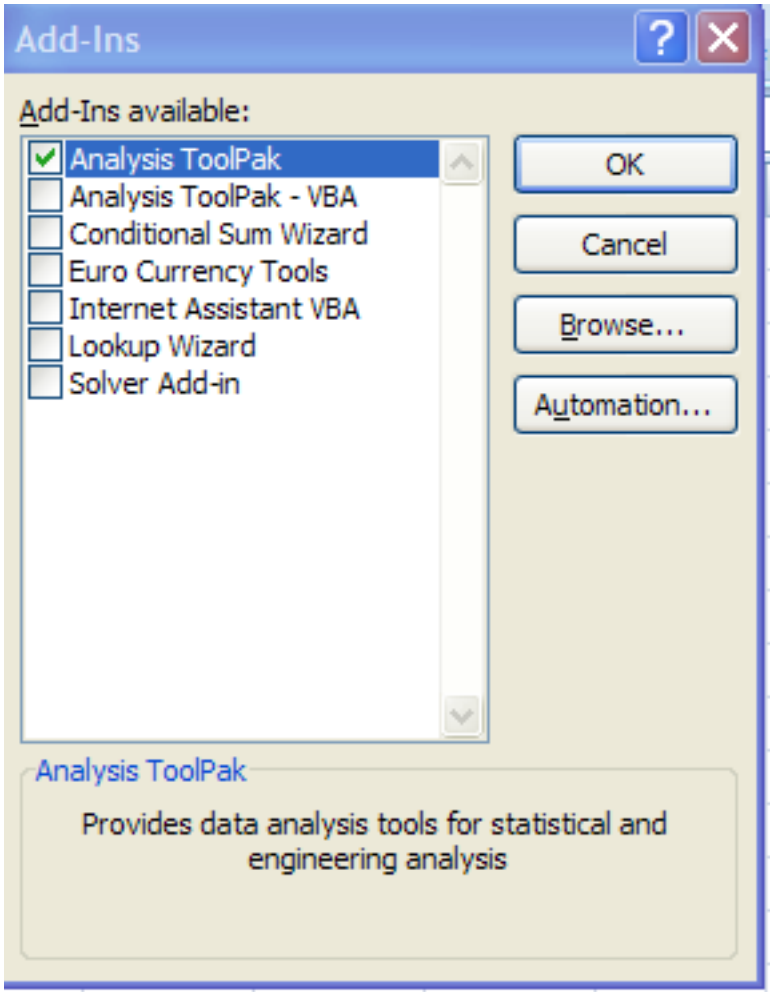
Tutorial Date: 17th February, 2010 by Nathan Smith

Install the Analysis ToolPak



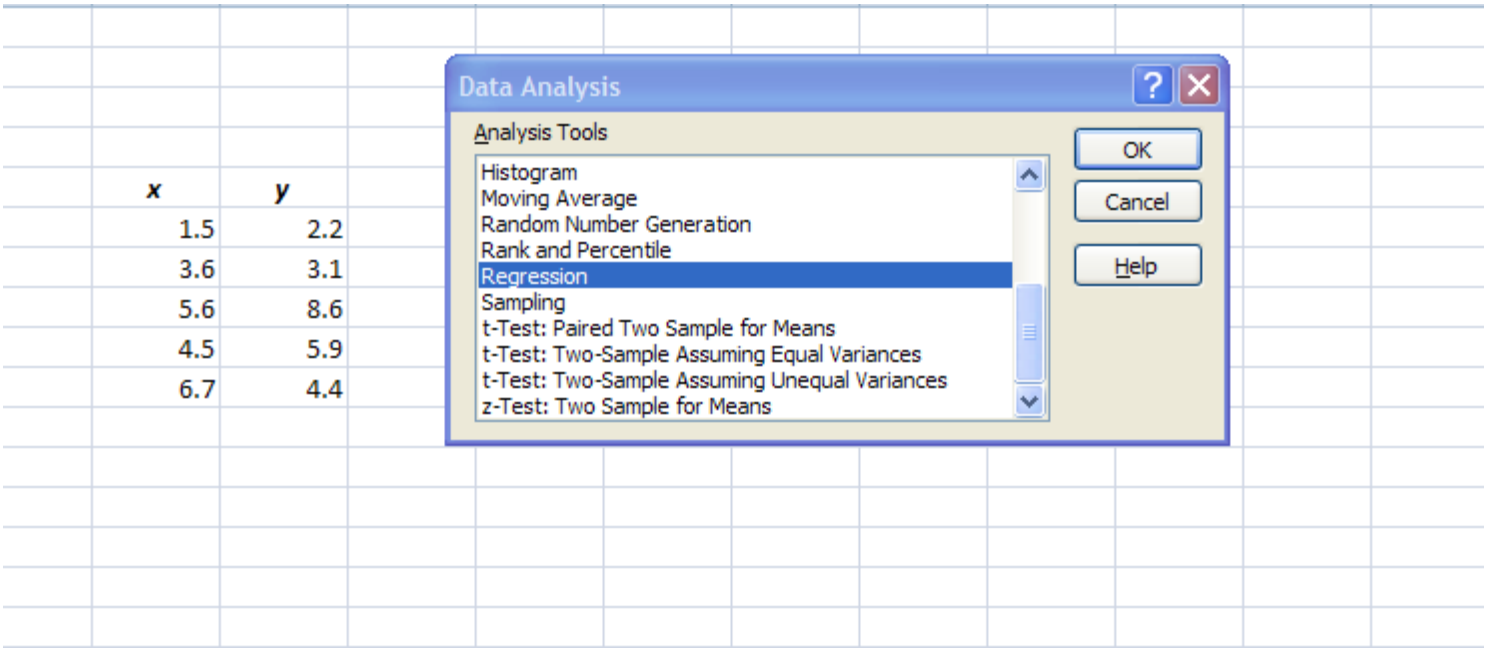
1. In the Microsoft Office button, go to excel options to click Add-ins
2. In the Add-Ins box, select Analysis ToolPak and click Go...

Install the Analysis ToolPak (continue)



3. In the Add-Ins available box, check the Analysis ToolPak and then OK
4. If Analysis ToolPak is not listed in the Add-Ins available box, click Browse to locate it.

Linear Regression using the Data Analysis Add-In



Suppose we want to determine a whether Y is a function of X

(Y)i = a + b(X)i + (error)i

where:

(Y)i = value of Y for observation i

a = mean value of Y when X is zero (inercept coefficient)

b = average change in Y given a one unit change in X, i,e (slope of X)

(X)i = value of X for observation i

1. In the data analysis tool select the regression and then click Ok.

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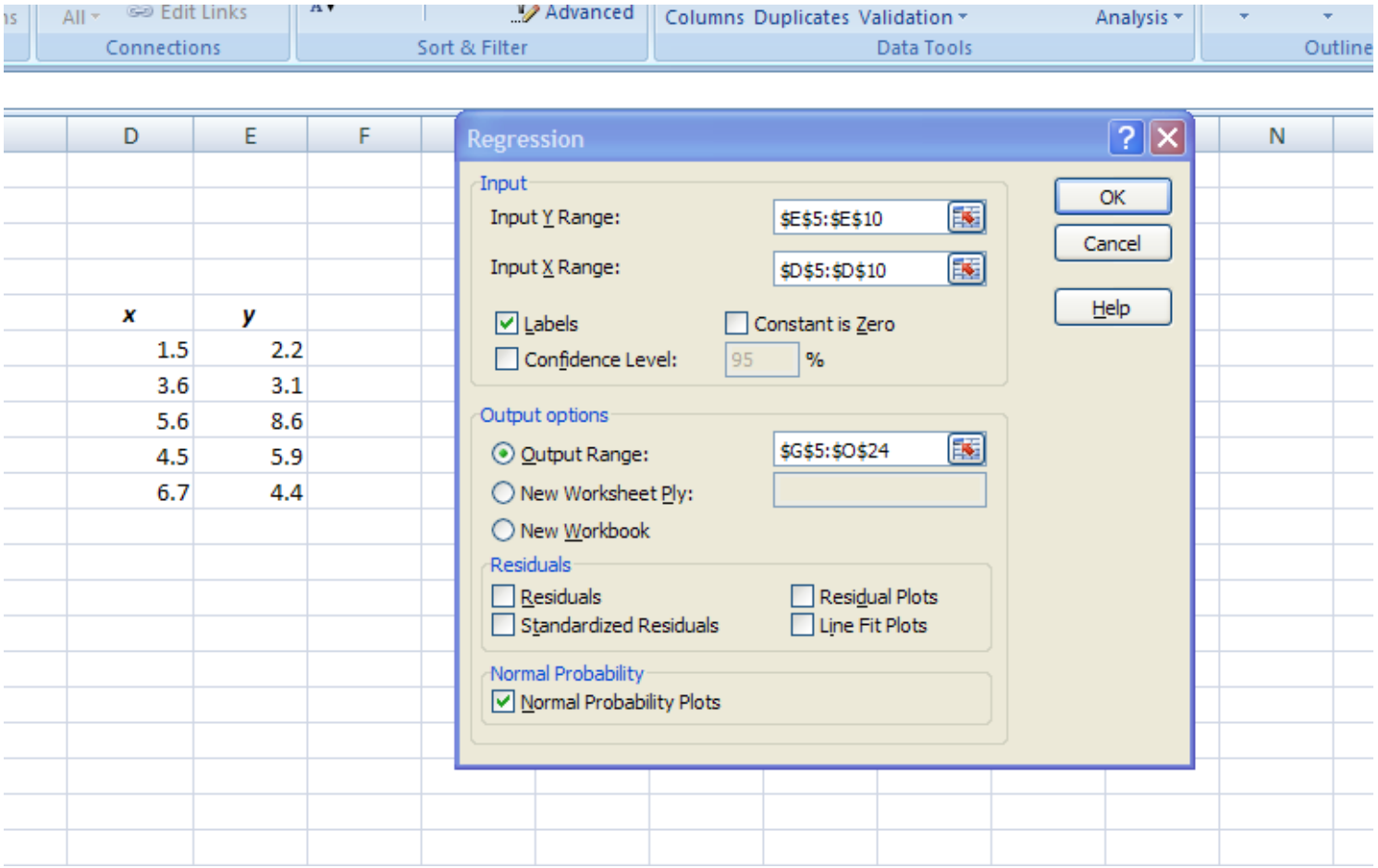
Select the Input Data Set for Y and X values



2. After clicking the regression, a regression box appears.
3. Select the Inputs for Y range and X range.
4. Select the place where you want your output
5. Check the Labels and then click Ok

Output

x	y
1.5	2.2
3.6	3.1
5.6	8.6
4.5	5.9
6.7	4.4

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.631253
R Square	0.39848
Adjusted I	0.197973
Standard E	2.259047
Observati	5

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ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	10.14212	10.14212	1.987366	0.253402
Residual	3	15.30988	5.103295		
Total	4	25.452			

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	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	1.329453	2.687341	0.494709	0.654767	-7.22287	9.881772	-7.22287	9.881772
X	0.801495	0.568541	1.40974	0.253402	-1.00786	2.610846	-1.00786	2.610846

The output is given in the coefficients column in the last set of output

1. a = 1.329 (Intercept Coefficient)
2. b = 0.801 (Coefficient of X i.e. slope)

So our regression equation is Y = 1.329 + 0.801(X)

Also in the regression statistics output gives the goodness of fit measure

3. Adjusted R square = 0.3984 which measures the fit

   This means 39.84% of Y is determined by X