

SPSS for Regression Analysis

I. Data File Format

- need two columns; one containing the data for the independent data (X) and the second containing the dependent variable data (Y). See the data file example below:

23	13
23	14
25	10
20	19
17	25
etc...	

II. The Analysis

- (1) From the pull-down menu:

Analyze → *Regression* → *Linear* <click on this>

- (2) Specify the appropriate variables:

- click the appropriate column name from the list on the left and click on the arrow button to include it as a dependent or independent variable.

- (3) Specify the appropriate test statistics:

- click on the “*Statistics*” button in the main regression dialog menu.

- click on the boxes for: “*Estimates*”, “*Confidence Intervals*”, “*Model fit*”, and “*Descriptives*”

Specify normality plots for assumption checking:

- click on the “*Plots*” button in the main regression dialog menu.

- click on the box for “*Normal probability plot*” (or “*Histogram*”) to check the normality of standardized residuals plotted in either fashion.

- (4) Specify new variables to be added to your data file for inspection of influential outliers

- click on the “*Save*” button in the main regression dialog menu.

- click on the boxes for: “*Unstandardized Predicted Values*”, “*Studentized Residuals*”, “*Cook’s*” and “*Standardized DfBeta(s)*”. This will result in three new data columns on your spreadsheet containing these three variables, which you can use for inspection of possible influential outliers.

- Now you can click on “*OK*” in the main menu to run the analysis.

- (5) Produce a plot of your data for inspecting linearity assumption

- from the main pull-down menu select: *Graphs* → *Scatter* <click on this>

- in the scatterplot menu click on “*Simple*”. Then click the appropriate column names for your X and Y variables from the list on the left and click on the arrow button to include these on the “*X*” and “*Y*” axes.

- (6) Produce a plot of your data for inspecting constant variance assumption

- from the main pull-down menu select: *Graphs* → *Scatter* <click on this>

- in the scatterplot menu click on “*Simple*”. Then click on the “*Studentized Residual*” variable for your Y axis and “*Unstandardized Predicted Value*” for your X axis.

- (7) Produce a plot of your data, the regression line, confidence intervals, and statistics

- from the main pull-down menu select: *Graphs* → *Interactive* → *Scatterplots* <click on this>

- within the “*Assign Variables*” tab: drag the appropriate variable names to the X and Y positions on the indicated graph axes.

- click on the “*Fit*” tab. Then within the “*Fit*” tab: for “*Method*” choose “*Regression*”.

- if you want confidence intervals or prediction intervals click on the boxes for “*Prediction lines*” for “*Mean*” and “*Individual*”. Then click on “*OK*”.

- this produces a nice summary graph.

III. Output

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
Weight Loss in mg	6.0222	1.73676	9
% Relative Humidity	50.3889	32.21294	9

Correlations

		Weight Loss in mg	% Relative Humidity
Pearson Correlation	Weight Loss in mg	1.000	-.987
	% Relative Humidity	-.987	1.000
Sig. (1-tailed)	Weight Loss in mg	.	.000
	% Relative Humidity	.000	.
N	Weight Loss in mg	9	9
	% Relative Humidity	9	9

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	% Relative Humidity	.	Enter

- a. All requested variables entered.
- b. Dependent Variable: Weight Loss in mg

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.987 ^a	.974	.971	.29666

- a. Predictors: (Constant), % Relative Humidity
- b. Dependent Variable: Weight Loss in mg

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.514	1	23.514	267.183	.000 ^a
	Residual	.616	7	.088		
	Total	24.131	8			

- a. Predictors: (Constant), % Relative Humidity
- b. Dependent Variable: Weight Loss in mg

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	8.704	.192		45.437	.000	8.251	9.157
	% Relative Humidity	-5.32E-02	.003	-.987	-16.346	.000	-.061	-.046

a. Dependent Variable: Weight Loss in mg

Residuals Statistics^a

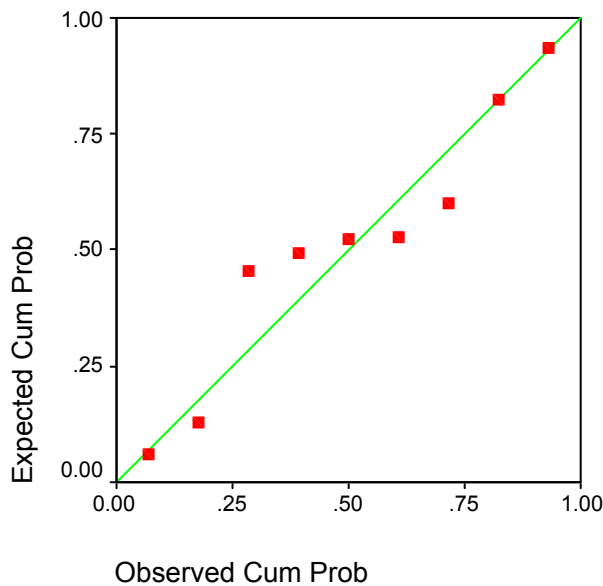
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.7544	8.7040	6.0222	1.71444	9
Std. Predicted Value	-1.323	1.564	.000	1.000	9
Standard Error of Predicted Value	.09925	.19156	.13634	.03301	9
Adjusted Predicted Value	3.7713	8.5067	6.0056	1.68275	9
Residual	-.4640	.4524	.0000	.27750	9
Std. Residual	-1.564	1.525	.000	.935	9
Stud. Residual	-1.710	1.634	.023	1.039	9
Deleted Residual	-.5548	.5192	.0166	.34610	9
Stud. Deleted Residual	-2.075	1.923	.013	1.188	9
Mahal. Distance	.007	2.447	.889	.856	9
Cook's Distance	.000	.531	.126	.183	9
Centered Leverage Value	.001	.306	.111	.107	9

a. Dependent Variable: Weight Loss in mg

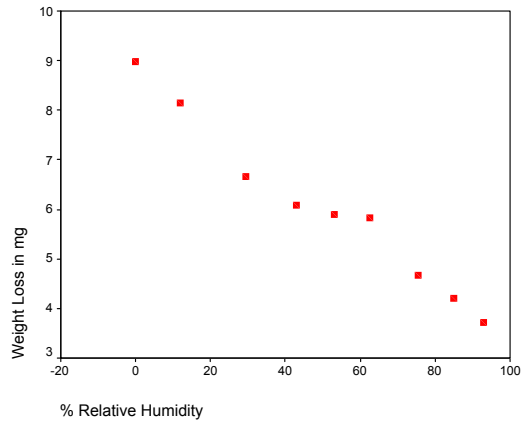
Charts

Normal P-P Plot of Regression Stand

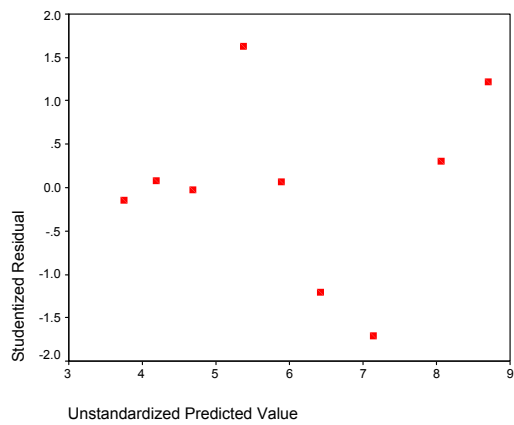
Dependent Variable: Weight Loss in r



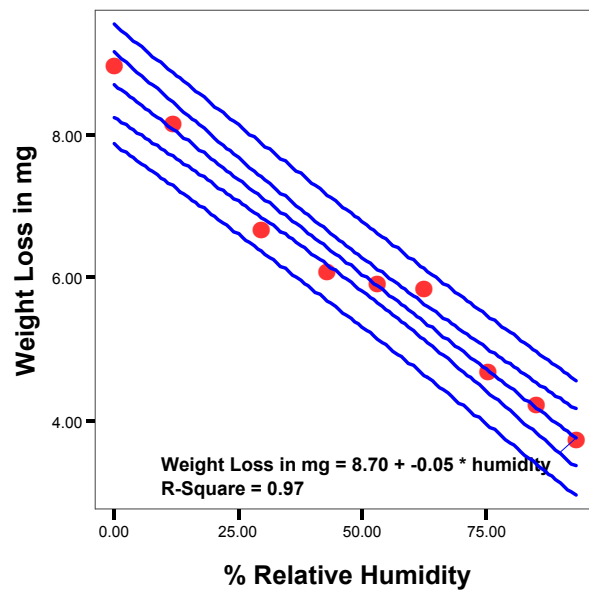
Graph



Graph



Interactive Graph



Linear Regression with
95.00% Mean Prediction Interval and
95.00% Individual Prediction Interval