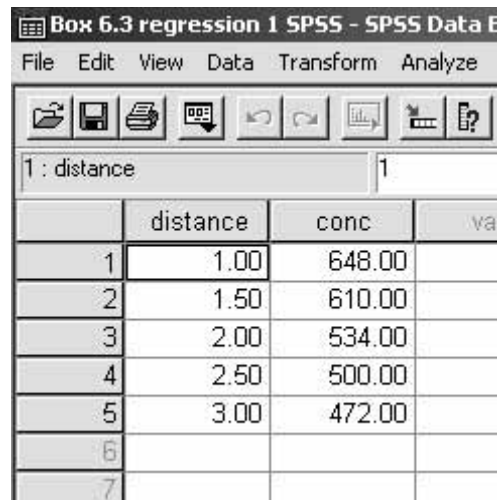




Transfer to data view using the tabs at the bottom left, and type in the data.



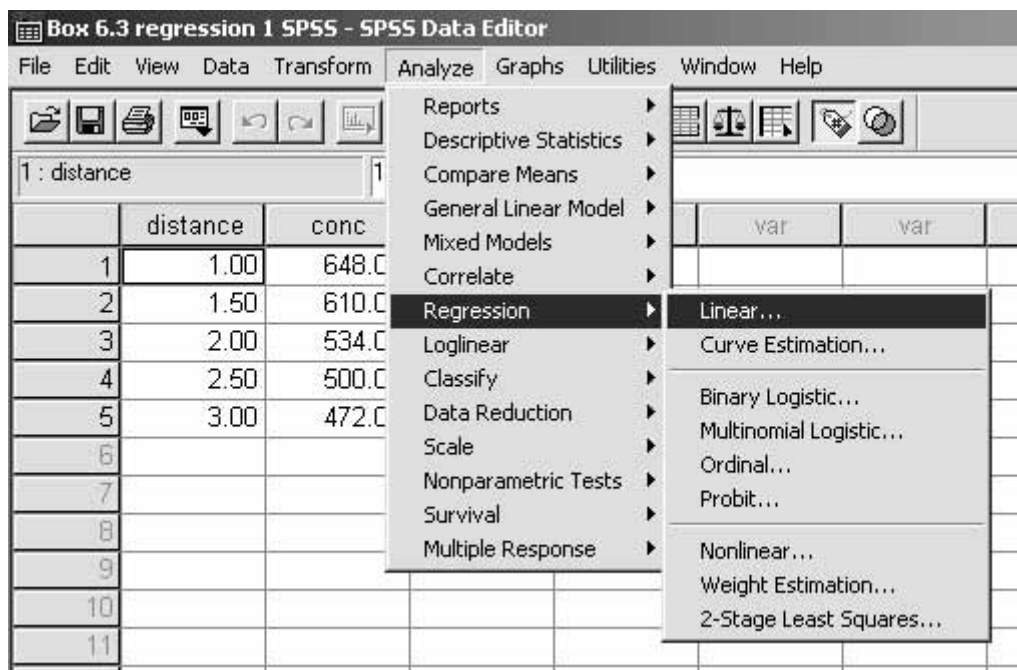
Box 6.3 regression 1 SPSS - SPSS Data Editor

File Edit View Data Transform Analyze

1 : distance 1

	distance	conc	var
1	1.00	648.00	
2	1.50	610.00	
3	2.00	534.00	
4	2.50	500.00	
5	3.00	472.00	
6			
7			

Step 2. Perform the test. Go to 'Analyze', 'Regression', 'Linear'.



Box 6.3 regression 1 SPSS - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Window Help

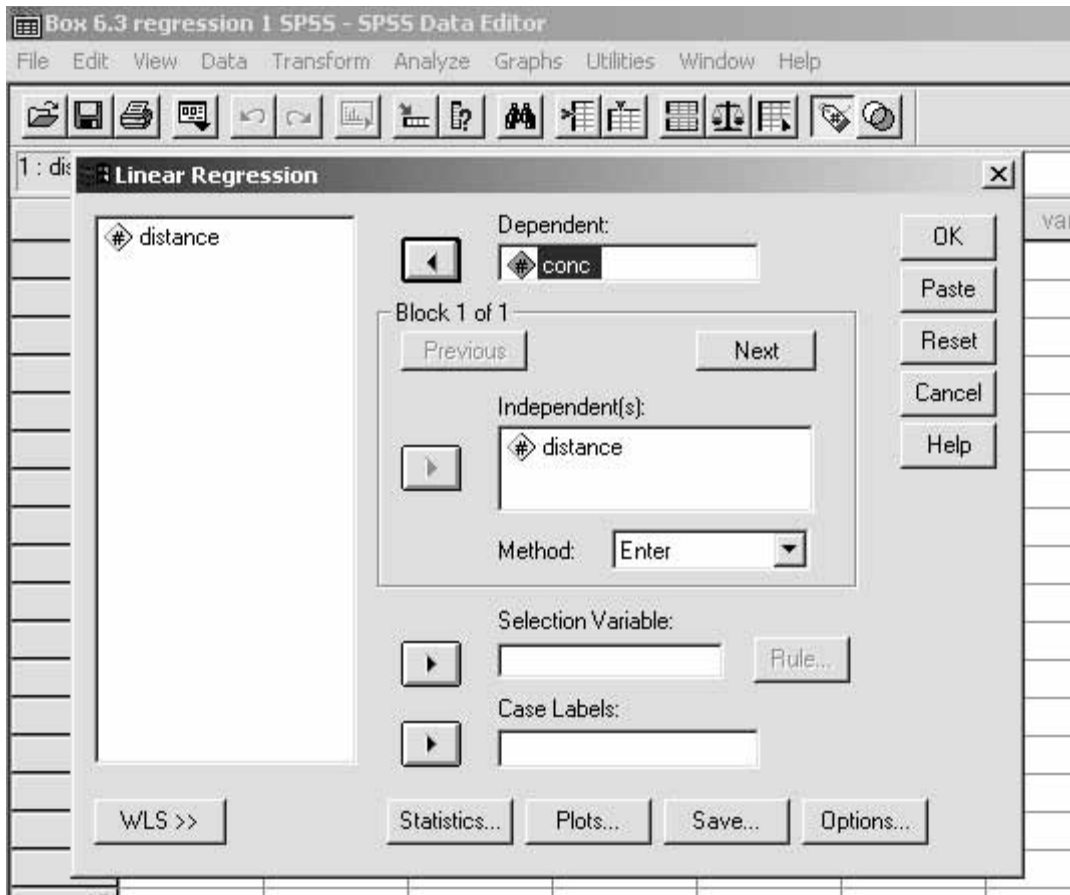
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	distance	conc	var	var
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6				
7				
8				
9				
10				
11				

- Reports
- Descriptive Statistics
- Compare Means
- General Linear Model
- Mixed Models
- Correlate
- Regression
  - Linear...
  - Curve Estimation...
  - Binary Logistic...
  - Multinomial Logistic...
  - Ordinal...
  - Probit...
  - Nonlinear...
  - Weight Estimation...
  - 2-Stage Least Squares...
- Loglinear
- Classify
- Data Reduction
- Scale
- Nonparametric Tests
- Survival
- Multiple Response

The variable under the control of the investigator (independent variable) is distance, so click on this to highlight it, then click on the appropriate arrow to transfer it to the 'Independent(s)' box. In the same way transfer 'conc' (the dependent variable – the variable we measured under

circumstances determined by the independent variable) into the 'dependent' box.



Click on 'OK'. The results will appear in a separate window.

#### Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	DISTANCE(a)	.	Enter

a All requested variables entered.

b Dependent Variable: CONC

## Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985(a)	.970	.960	14.83689

a Predictors: (Constant), DISTANCE

## ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21344.400	1	21344.400	96.961	.002(a)
	Residual	660.400	3	220.133		
	Total	22004.800	4			

a Predictors: (Constant), DISTANCE

b Dependent Variable: CONC

## Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	737.600	19.906		37.055	.000
	DISTANCE	-92.400	9.384	-.985	-9.847	.002

a Dependent Variable: CONC

**Step 3.** Decide what the results mean.

The important bit of the output is in the last table, in the column headed 'B'. The first number here (737.600) is the constant in the regression equation, and the second ( - 92.400) is the gradient of the regression line. The equation of the regression line is

(independent variable) = constant + (gradient) × (independent variable)

which in this case gives:  $\text{conc} = 737.6 - 92.4 \times (\text{distance})$ .

**Step 4.** To test the significance of the regression carry out the analysis as in step 3, and the output obtained is as below:

## Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	DISTANCE(a)	.	Enter

a All requested variables entered.

b Dependent Variable: CONC

## Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.985(a)	.970	.960	14.83689

a Predictors: (Constant), DISTANCE

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Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21344.400	1	21344.400	96.961	.002(a)
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	Total	22004.800	4			

a Predictors: (Constant), DISTANCE

b Dependent Variable: CONC

## Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	737.600	19.906		37.055	.000
	DISTANCE	-92.400	9.384	-.985	-9.847	.002

a Dependent Variable: CONC

The important bit here is again in the last table, in the column headed 't'. The calculated value of  $t$  is  $-9.847$  (it is negative because the gradient is negative; we ignore the minus sign when comparing it with critical values). The column headed 'Sig.' gives the significance of the correlation in the form of a  $p$  value: in this case, it is 0.002. We conclude that there is a significant association, at better than  $p = 0.01$ , between the zinc concentration and the distance from the pylon. However, because  $t$  is negative, it is a negative correlation, i.e. as distance from the pylon increases, the zinc concentration in the soil decreases.