## Kendall's Coefficient of Concordance

It is not uncommon that a group of people are asked to judge a group of persons or objects by rank ordering them from highest to lowest. It is then desirable to have some index of the degree to which the various judges agreed, that is, ranked the objects in the same order. The Coefficient of Concordance is a measure varying between 0 and 1 that indicates the degree of agreement among judges. It is defined as:

W = Variance of rank sums / maximum variance of rank sums.

The coefficient W may also be used to obtain the average rank correlation among the judges by the formula:

$$Mr = (mW - 1) / (m - 1)$$

where Mr is the average (Spearman) rank correlation, m is the number of judges and W is the Coefficient of Concordance.

The file sucsintv.LAZ is used to demonstrate the LazStats procedure for this analysis:

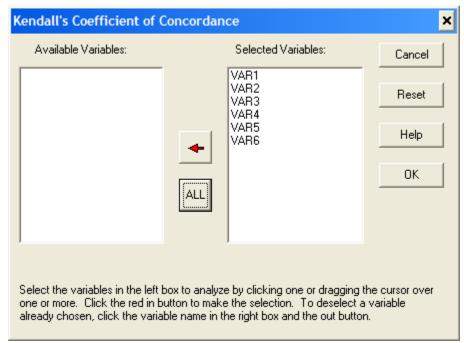


Figure 1. Coefficient of Concordance Form

Kendall's Coefficient of Concordance Analysis

Ranks Assigned to Judge's Ratings of Objects

Judge 1		Objec	ts			
VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	
5.5000	4.0000	3.0000	2.0000	1.0000	7.0000	
<del>-</del> 1 0	Objects					
Judge 2		Objec	ts			
Judge 2 VAR1	VAR2	Objec VAR3	ts VAR4	VAR5	VAR6	

Juo	dge 3		Objec	ts		
	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
	6.0000	3.5000	5.5000	2.0000	1.0000	5.0000
Juo	dge 4	VAR2 5.0000	Objec	ts		
	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
	6.0000	5.0000	3.5000	2.0000	1.0000	4.0000
Juo	dge 5	VAR2	Objec	ts		
	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
	6.0000	4.0000	4.0000	2.0000	1.0000	3.0000
Juo	dge 6	VAR2 5.0000	Objec	ts		
	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
	6.0000	5.0000	4.0000	2.5000	1.0000	2.0000
Juo	dge 7	VAR2	Objec	ts		
	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
	6.0000	5.0000	4.0000	3.0000	2.0000	1.0000
Juc	dge 8		Objec	ts		
Ju	dge 8 VAR1	VAR2	Objec VAR3	ts VAR4	VAR5	VAR6
Juo	dge 8 VAR1 6.0000	VAR2 4.5000	Objec VAR3 3.0000	ts VAR4 2.0000	VAR5 1.0000	VAR6 6.0000
	6.0000	4.5000	3.0000	2.0000	1.0000	6.0000
	6.0000	4.5000	3.0000	2.0000	1.0000	6.0000
Juo	dge 9 VAR1	4.5000 VAR2	Objec VAR3	2.0000 ts VAR4	VAR5	6.0000 VAR6
Juo	dge 9 VAR1	VAR2 4.5000 VAR2 4.5000	Objec VAR3	2.0000 ts VAR4	VAR5	6.0000 VAR6
Juo	dge 9 VAR1 6.0000	VAR2 4.5000	Objec VAR3 3.0000	2.0000 ts VAR4 2.0000	VAR5	0.0000 VAR6
Jud	dge 9 VAR1 6.0000	VAR2 4.5000	Objec VAR3 3.0000 Objec	ts VAR4 2.0000	VAR5 1.0000	VAR6 5.0000
Jud	dge 9 VAR1 6.0000 dge 10 VAR1	VAR2 4.5000 VAR2	Objec VAR3 3.0000 Objec VAR3	2.0000 ts VAR4 2.0000 ts VAR4	VAR5 1.0000 VAR5	VAR6 5.0000
Jud	dge 9 VAR1 6.0000 dge 10 VAR1	VAR2 4.5000	Objec VAR3 3.0000 Objec VAR3	2.0000 ts VAR4 2.0000 ts VAR4	VAR5 1.0000 VAR5	VAR6 5.0000
Jud	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000	VAR2 4.5000 VAR2 5.0000	Objec VAR3 3.0000 Objec VAR3 3.5000	ts VAR4 2.0000 ts VAR4 2.0000	VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000
Jud	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000	VAR2 4.5000 VAR2 5.0000	Objec VAR3 3.0000 Objec VAR3 3.5000	ts VAR4 2.0000 ts VAR4 2.0000	VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000
Jud	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000	VAR2 4.5000 VAR2 5.0000	Objec VAR3 3.0000 Objec VAR3 3.5000	ts VAR4 2.0000 ts VAR4 2.0000	VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000
Jud	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000	VAR2 4.5000 VAR2 5.0000	Objec VAR3 3.0000 Objec VAR3 3.5000	ts VAR4 2.0000 ts VAR4 2.0000	VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000
Jud Jud	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000 dge 11 VAR1 6.0000	VAR2 4.5000 VAR2 5.0000 VAR2 4.5000	Objec VAR3 3.0000 Objec VAR3 3.5000 Objec VAR3 2.5000	ts VAR4 2.0000 ts VAR4 2.0000 ts VAR4 4.0000	VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000
Juo Juo Juo	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000 dge 11 VAR1 6.0000	VAR2 4.5000 VAR2 5.0000 VAR2 4.5000	Objec VAR3 3.0000 Objec VAR3 3.5000 Objec VAR3 2.5000 Objec	ts VAR4 2.0000 ts VAR4 2.0000 ts VAR4 4.0000 ts	VAR5 1.0000 VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000 VAR6 3.0000
Juo Juo Juo	dge 9 VAR1 6.0000 dge 10 VAR1 6.0000 dge 11 VAR1 6.0000 dge 12 VAR1	VAR2 4.5000 VAR2 5.0000 VAR2 4.5000	Objec VAR3 3.0000 Objec VAR3 3.5000 Objec VAR3 2.5000 Objec VAR3	z.0000 ts VAR4 2.0000 ts VAR4 2.0000 ts VAR4 4.0000	VAR5 1.0000 VAR5 1.0000 VAR5 1.0000	VAR6 5.0000 VAR6 4.0000 VAR6 3.0000

Sum of Ranks for Each Object Judged Objects

VAR1 VAR2 VAR3 VAR4 VAR5 VAR6 71.5000 54.5000 43.0000 28.0000 13.0000 48.0000

Coefficient of concordance = 0.864

Average Spearman Rank Correlation = 0.852

Chi-Square Statistic = 51.844

Probability of a larger Chi-Square = 0.0000

Warning - Above Chi-Square is very approximate with only 7 variables!