Kendall’s Rank Correlation in R, Kendall’s rank correlation coefficient is suitable for the paired ranks as in the case of Spearman’s rank correlation.

The condition is that both the variables X and Y be measured on at least an ordinal scale.

One advantage of Kendall Tau over Spearman’s rank correlation is that tau can be generalized to a partial correlation coefficient which is not possible in the case of rs.

**Procedure**

The procedure of Kendall τ consists of the following steps.

**Step1:-** Arrange the rank of the first set (X) in ascending order and rearrange the ranks of the second set (Y) in such a way that n pairs of rank remain the same.

**Step2:-**The ranks of X are in the natural order. Now we are left to how many pairs of ranks in the set Y are in a natural order and how many are not.

A number is said to be in natural order if it is smaller than the succeeding number and is coded as +1. And also if it is greater than its succeeding number then it will not be taken as a natural order and will be coded as -1.

**Step3:-**Find the sum of all coded values.

**Step4:-** The formula for Kendall tau is

**τ=2S/n(n-1)**

**Properties**

Kendall’s tau range between -1 to 1.

If n is large Kendall’s τ equal to the 2/3 rd of Spearman’s rank correlation.

If τ=1 indicates the ranking of X is in the same order as the ranking of Y.

If τ=-1 indicates the ranking of X is in reverse order of the ranking of Y.

**Kendall’s Rank Correlation in R**

Let’s see how to execute Kendall’s τ in R.

x<-c(1,2,3,2,1,3,4,2,5,2,6,5,5)

y<-c(5,5,6,2,1,4,4,2,1,2,1,5,5)

res<-cor.test(x,y, method="kendall")

res

Kendall’s rank correlation tau

data:  x and y

z = 0.12931, p-value = 0.8971

alternative hypothesis: true tau is not equal to 0

sample estimates:

       tau

0.03030651

**Conclusion**

The correlation coefficient between x and y is 0.03030651and the p-value is 0.8971.