$$f(r,n) = \frac{rf(r,n-1) + 2f(r-1,n-1) + (n-r)f(r-2,n-1)}{n},$$

with the initial condition

$$f(1,n) = \frac{2}{n!}.$$

References

Bradley, J.V., *Distribution-Free Statistical Tests*, Prentice Hall, Englewood Cliffs, New Jersey, 1968.

Olmstead, P.S., Distribution of sample arrangements for runs up and down, *Annals of Mathematical Statistics*, *17*, 24-33, 1946.

See Also

Chapter III-12, **Statistics** for a function and operation overview; the **StatsSRTest** function.

StatsScheffeTest

`StatsScheffeTest [`*`flags`*`] [`*`wave1, wave2,… wave100`*`]`

The StatsScheffeTest operation performs Scheffe's test for the equality of the means. It supports two basic modes: the default tests all possible combinations of pairs of waves; the second tests a single combination where the precise form of H_0 is determined by the coefficients of a contrast wave (see /CONT). Output is to the M_ScheffeTestResults wave in the current data folder.

Flags

/ALPH=*val* Sets the significance level (default 0.05).

/CONW=*cWave* Performs a multiple contrasts test. *cWave* has one point for each input wave. The *cWave* value is 1 to include the corresponding (zero based) input wave in the first group, 2 to include the wave in the second group, or zero to exclude the wave.

The contrast is defined as the difference between the normalized sum of the ranks of the first group and that of the second group. If *cWave*={0,1,1,1,2}, then the contrast hypothesis H_0 corresponds to:

$$\frac{\bar{X}_1 + \bar{X}_2 + \bar{X}_3}{3} - \bar{X}_4 = 0.$$

For each pair of waves (*i*, *j*) with *i* ¦ *j*, it computes

$$SE_{ij} = \sqrt{s^2\left(\frac{1}{n_j} + \frac{1}{n_i}\right)}, \qquad s^2 = \sum_{i=1}^{W}\sum_{j=0}^{n_j-1} X_j^2 - \sum_{i=1}^{W}\frac{\left(\sum_{j=0}^{n_j-1} X_j\right)^2}{n_j},$$

the statistic

$$S = \frac{\left|\sum_{i=0}^{n-1} c_i \bar{X}_i\right|}{SE},$$