StatsMaxwellPDF

StatsMaxwellPDF(*x*, *k*)

The StatsMaxwellPDF function returns Maxwell's probability distribution function

$$f(x;k) = \sqrt{\frac{2}{\pi}} k^{3/2} x^2 \exp\left(-\frac{kx^2}{2}\right), \qquad x > 0.$$

The Maxwell distribution describes, for example, the speed distribution of molecules in an ideal gas.

See Also

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

StatsMedian

StatsMedian(*waveName*)

The StatsMedian function returns the median value of a numeric wave *waveName*, which must not contain NaNs.

Example

```
Make/N=5 sample1={1,2,3,4,5}
Print StatsMedian(sample1)
3
Make/N=6 sample2={1,2,3,4,5,6}
Print StatsMedian(sample2)
3.5
```

See Also

Chapter III-12, **Statistics** for a function and operation overview

median, **WaveStats**, **StatsQuantiles**

StatsMooreCDF

StatsMooreCDF(*x*, *N*)

The StatsMooreCDF function returns the cumulative distribution function for Moore's R*, which is used in a nonparametric version of the Rayleigh test for uniform distribution around the circle. It supports the range $3 \le N \le 120$ and does not change appreciably for $N>120$.

The distribution is computed from polynomial approximations derived from simulations and should be accurate to approximately three significant digits.

References

Moore, B.R., A modification of the Rayleigh test for vector data, *Biometrica*, *67*, 175-180, 1980.

See Also

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

StatsMultiCorrelationTest

StatsMultiCorrelationTest [*flags*] *corrWave*, *sizeWave*

The StatsMultiCorrelationTest operation performs various tests on multiple correlation coefficients. Inputs are two 1D waves: *corrWave*, containing correlation coefficients, and *sizeWave*, containing the size (number of elements) of the corresponding samples. Although you can do all the tests at the same time, it rarely makes sense to do so.

Flags

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

/CON={*controlRow*,*tails*}

Performs a multiple comparison test using the *controlRow* element of *corrWave* as a control. It is one- or two-tailed test according to the tails parameter. Output is to the M_ControlCorrTestResults wave in the current data folder.

/CONT=*cWave* Performs a multiple contrasts test on the correlation coefficients. The contrasts wave, *cWave*, contains the contrast factor, c_i, entry for each of the n correlation coefficients r_i in *corrWave*, and satisfying the condition that the sum of the entries in *cWave* is zero. H_0 corresponds to

$$\sum_{i=0}^{n-1} c_i r_i = 0.$$

The test statistic S is

$$S = \frac{1}{\sqrt{\frac{c_i^2}{n_i - 3}}} \left| \sum_{i=0}^{n-1} c_i z_i \right|,$$

where z_i is the Fisher z transform of the correlation coefficient r_i:

$$z_i = \frac{1}{2} \ln\left(\frac{1 + r_i}{1 - r_i} \right).$$

It produces the SE value, the contrast statistic S, and the critical value, which are labeled ContrastSE, ContrastS, and Contrast_Critical, respectively, in the W_StatsMultiCorrelationTest wave.

/Q No results printed in the history area.

/T=*k* Displays results in a table. *k* specifies the table behavior when it is closed.

k=0: Normal with dialog (default).

k=1: Kills with no dialog.

k=2: Disables killing.

/TUK Performs a Tukey-type multi comparison testing between the correlation coefficients by comparing every possible combination of pairs of correlation coefficients, computing the difference in their z-transforms, the SE, and the q statistic:

$$q = \frac{\left| z_j - z_i \right|}{\sqrt{\frac{1}{2}\left(\frac{1}{n_i - 3} + \frac{1}{n_j - 3} \right)}}.$$

The critical value is computed from the q CDF (**StatsInvQCDF**) with degrees of freedom *numWaves* and infinity. Output is to the M_TukeyCorrTestResults wave in the current data folder or optionally to a table.

/Z Ignores errors. V_flag will be set to -1 for any error and to zero otherwise.

Details

Without any flags, StatsMultiCorrelationTest computes χ^2 for the correlation coefficients and compares it with the critical value.