- Mutual independence by testing if all three variables are independent of each other.
- Partial dependence (rows) by testing if rows independent of columns and layers.
- Partial dependence (columns) by testing if columns independent of rows and layers.
- Partial dependence (layers) by testing if layers independent of rows and columns.

In each case you should compare the statistic with the critical value and reject H_0 if the statistic exceeds or equals the critical value.

You should examine the table entries to determine if the Chi-square statistic is appropriate (if the frequency is smaller than 6 for /ALPH=0.05 you should consider computing the Fisher exact test).

V_flag will be set to -1 for any error and to zero otherwise.

See Also

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

StatsCorrelation

`StatsCorrelation(`*`waveA`* `[,` *`waveB`*`])`

The StatsCorrelation function computes Pearson's correlation coefficient between two real valued arrays of data of the same length. Pearson r is give by:

$$r = \frac{\sum_{i=0}^{n-1}\left(waveA[i]-A\right)\left(waveB[i]-B\right)}{\sqrt{\sum_{i=0}^{n-1}\left(waveA[i]-A\right)^2 \sum_{i=0}^{n-1}\left(waveB[i]-B\right)^2}}$$

Here *A* is the average of the elements in *waveA*, *B* is the average of the elements of *waveB* and the sum is over all wave elements.

Details

If you use both *waveA* and *waveB* then the two waves must have the same number of points but they could be of different number type. If you use only the *waveA* parameter then *waveA* must be a 2D wave. In this case StatsCorrelation will return 0 and create a 2D wave M_Pearson where the (*i,j*) element is Pearson's r corresponding to columns *i* and *j*.

Fisher's z transformation converts Person's r above to a normally distributed variable *z*:

$$z = \frac{1}{2}\ln\left(\frac{1+r}{1-r}\right),$$

with a standard error

$$\sigma_z = \frac{1}{\sqrt{n-3}}.$$

You can convert between the two representations using the following functions:

```
Function pearsonToFisher(inr)
   Variable inr
   return 0.5*(ln(1+inr)-ln(1-inr))
End

Function fisherToPearson(inz)
   Variable inz
   return tanh(inz)
End
```

See Also

Correlate, **StatsLinearCorrelationTest**, and **StatsCircularCorrelationTest**.