StatsTrimmedMean

`StatsTrimmedMean(`*`waveName`*`, `*`trimValue`*`)`

The StatsTrimmedMean function returns the mean of the wave *waveName* after removing *trimValue* fraction of the values from both tails of the distribution. *trimValue* is a number in the range [0, 0.5]. *waveName* can be any real numeric type.

See Also

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

StatsTTest

`StatsTTest [`*`flags`*`] `*`wave1`*` [, `*`wave2`*`]`

The StatsTTest operation performs two kinds of T-tests: the first compares the mean of a distribution with a specified mean value (/MEAN) and the second compares the means of the two distributions contained in *wave1* and *wave2*, which must contain at least two data points, can be any real numeric type, and can have an arbitrary number of dimensions. Output is to the W_StatsTTest wave in the current data folder or optionally to a table.

Flags

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

/CI — Computes the confidence intervals for the mean(s).

/DFM=*m* — Specifies method for calculating the degrees of freedom.

- *m*=0: Default; computes equivalent degrees of freedom accounting for possibly different variances.
- *m*=1: Computes equivalent degrees of freedom but truncates to a smaller integer.
- *m*=2: Computes degrees of freedom by $DF=n_1+n_2-2$, where n is the sum of points in the wave. Appropriate when variances are equal.

/MEAN=*meanV* — Compares *meanV* with the mean of the distribution in *wave1*. Outputs are the number of points in the wave, the degrees of freedom (accounting for any NaNs), the average, standard deviation (σ),

$$s_{\overline{X}} = \frac{\sigma}{\sqrt{DF+1}},$$

the statistic

$$t = \frac{\overline{X} - meanV}{s_{\overline{X}}}$$

and the critical value, which depends on /TAIL.

/PAIR — Specifies that the input waves are pairs and computes the difference of each pair of data to get the average difference $\bar{d}$ and the standard error of the difference $S_{\bar{d}}$. The t statistic is the ratio of the two

$$t = \frac{\bar{d}}{s_{\bar{d}}}.$$

In this case H_0 is that the difference $\bar{d}$ is zero.

This mode does not support /CI and /DFM.

/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.

The table is associated with the test, not the data. If you repeat the test, it will update any existing table with the new results.

/TAIL=*tailCode* Specifies H_0.

tailCode=1: One tailed test ($\mu_1 \le \mu_2$).

tailCode=2: One tailed test ($\mu_1 \ge \mu_2$).

tailCode=4: Default; two tailed test ($\mu_1 = \mu_2$).

When performing paired tests using /PAIR:

tailCode=1: One tailed test ($\mu_d \le 0$).

tailCode=2: One tailed test ($\mu_d \ge 0$).

tailCode=4: Default; two tailed test ($\mu_d = 0$).

Here μ_d is the mean of the difference population.

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

Details

When comparing the mean of a single distribution with a hypothesized mean value, you should use /MEAN and only one wave (*wave1*). If you use two waves StatsTTest performs the T-test for the means of the corresponding distributions (which is incompatible with /MEAN).

When comparing the means of two distributions, the default t-statistic is computed from Welch's approximate t:

$$t' = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}},$$

where s_i^2 are variances, n_i the number of samples, and $\bar{X}_i$ the averages of the respective waves. This expression is appropriate when the number of points and the variances of the two waves are different. If you want to compute the t-statistic using pooled variance you can use the /AEVR flag. In this case the pooled variance is given by

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2},$$

and the t-statistic is

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}.$$

The different test are: