BARTLETT TEST

PURPOSE

Perform a k-sample Bartlett test for the homogeneity of variances across samples.

DESCRIPTION

The F test used in analysis of variance problem with k factors can be sensitive to unequal standard deviations in the k factors. Bartlett's test is a test of the hypothesis that all factor standard deviations (or equivalently variances) are equal against the alternative that the standard deviations are not all equal. The sampling distribution of the Bartlett statistic is approximately chi-square when the k factor samples are from independent normal populations. Note that Bartlett's test can be sensitive to departures from this normality assumption. The details for computing the Bartlett statistic can be found in most introductory statistics books that cover analysis of variance.

SYNTAX

BARTLETT TEST <y> <tag> <SUBSET/EXCEPT/FOR qualification>
where <y1> is a response variable;
<tag> is a factor identifier variable;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

BARTLETT TEST Y1 GROUP
BARTLETT TEST Y1 GROUP SUBSET GROUP > 2

NOTE 1

The various values printed by the BARTLETT TEST command are saved as parameters that can be used later by the analyst. Enter the command STATUS PARAMETERS after the BARTLETT TEST command to see a list of the saved parameters.

NOTE 2

The HOMOGENEITY PLOT is a graphical technique for testing for unequal variances.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

HOMOGENEITY PLOT	=	Plot group standard deviations against group means.
CONFIDENCE LIMITS	=	Compute the confidence limits for the mean of a sample.
F TEST	=	Performs a two-sample F test.
T TEST	=	Performs a two-sample t test.
CHI-SQUARE TEST	=	Performs a one sample chi-square test that the standard deviation is equal to a given value.
STANDARD DEVIATION	=	Computes the standard deviation of a variable.

REFERENCE

The Bartlett test is discussed in most introductory statistics books.

APPLICATIONS

Analysis of Variance, Regression

IMPLEMENTATION DATE

94/2

PROGRAM

```
SKIP 50
SET READ FORMAT 3F4.0,F5.0,F6.0,F3.0,2F9.0
READ PBF11.DAT YEAR DAY BOT SD F11 FLAG WV CO2
.
RETAIN YEAR DAY BOT SD F11 WV CO2 FLAG SUBSET FLAG 0
LET MONTH=INT(DAY/30.25)+1
.
BARTLETT TEST WV MONTH
STATUS PARAMETERS
```

The following output is generated.

```
               BARTLETT TEST
 HYPOTHESIS BEING TESTING--ALL SIGMAI ARE EQUAL

 TEST:
    DEG. OF FREEDOM (NUMER.)    =    12.00000
    DEG. OF FREEDOM (DENOM.)    =    85801.00

    TEST STATISTIC VALUE        =    44.26440
    CUTOFF: 95% PERCENT POINT   =    1.752285
    CUTOFF: 99% PERCENT POINT   =    2.184954

    F CDF VALUE                 =    1.000000

   HYPOTHESIS    ACCEPTANCE INTERVAL    CONCLUSION
 ALL SIGMA EQUAL    (0.000,0.950)         REJECT



 PARAMETER INFINITY  HAS THE VALUE:     0.3402823E+39
 PARAMETER PI        HAS THE VALUE:     0.3141593E+01
 PARAMETER STATVAL   HAS THE VALUE:     0.4426440E+02
 PARAMETER STATNU1   HAS THE VALUE:     0.1200000E+02
 PARAMETER STATNU2   HAS THE VALUE:     0.8580100E+05
 PARAMETER STATCDF   HAS THE VALUE:     0.1000000E+01
 PARAMETER CUTLOW95  HAS THE VALUE:     0.0000000E+00
 PARAMETER CUTUPP95  HAS THE VALUE:     0.1752285E+01
 PARAMETER CUTLOW99  HAS THE VALUE:     0.0000000E+00
 PARAMETER CUTUPP99  HAS THE VALUE:     0.2184954E+01
```