Package ‘testequavar’

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Type Package
Title Bootstrap Tests for Equality of 2, 3, or 4 Population Variances
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Description Tests the hypothesis that variances are homogeneous or not using bootstrap. The procedure uses a variance-based statistic, and is derived from a normal-theory test. The test equivalently expressed the hypothesis as a function of the log contrasts of the population variances. A box-type acceptance region is constructed to test the hypothesis. See Cahoy (2010) \doi{10.1016/j.csda.2010.04.012}.

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equa2vartest

**Bootstrap test for equality of two (2) population variances**

**Description**

Testing equality of two (2) population variances against the alternative that both variances are not equal.

**Usage**

`equa2vartest(x1, x2, a, B)`

**Arguments**

- `x1`: first sample vector of data or observations
- `x2`: second sample vector of data or observations
- `a`: significance level alpha
- `B`: number of bootstrap samples. At least 500 is recommended.

**Value**

list consisting of a non-numeric decision whether to reject the null hypothesis or not, the significance level, the number of bootstrap samples used, and the bootstrap P-value calculated using the Euclidean distance.

**References**


**Examples**

```r
x1=sqrt(10)*runif(8, -sqrt(3), sqrt(3) )
x2=sqrt(1)*runif(8, -sqrt(3), sqrt(3) )
equa2vartest(x1,x2,0.05, 1000)

x1=sqrt(1)*rexp(8)
x2=sqrt(1)*rexp(8)
equa2vartest(x1,x2,0.01, 1000)
```
equa3vartest

Bootstrap test for equality of three (3) population variances

Description

Testing equality of three (3) population variances against the alternative that all variances are unequal.

Usage

equa3vartest(x1, x2, x3, a, B)

Arguments

x1 first sample vector of data or observations
x2 second sample vector of data or observations
x3 third sample vector of data or observations
a significance level alpha
B number of bootstrap samples. At least 500 is recommended.

Value

list consisting of a non-numeric decision whether to reject the null hypothesis or not, the significance level, the number of bootstrap samples used, and the bootstrap P-value calculated using the Euclidean distance.

References


Examples

x1=sqrt(10)*runif(10, -sqrt(3), sqrt(3) )
x2=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
x3=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
equa3vartest(x1,x2,x3, a=0.05, B=1000)
equa3vartest( rexp(10) ,rexp(10) ,rexp(10) , a=0.01, B=1000)
equa4vartest  

*Bootstrap test for equality of four (4) population variances*

**Description**

Testing equality of four (4) population variances against the alternative that all variances are not equal.

**Usage**

```r
equa4vartest(x1, x2, x3, x4, a, B)
```

**Arguments**

- **x1**: first sample vector of data or observations
- **x2**: second sample vector of data or observations
- **x3**: third sample vector of data or observations
- **x4**: fourth sample vector of data or observations
- **a**: significance level alpha
- **B**: number of bootstrap samples. At least 500 is recommended.

**Value**

A list consisting of a non-numeric decision whether to reject the null hypothesis or not, the significance level, the number of bootstrap samples used, and the bootstrap P-value calculated using the Euclidean distance.

**References**


**Examples**

```r
x1=sqrt(10)*runif(10, -sqrt(3), sqrt(3) )
x2=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
x3=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
x4=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
equa4vartest(x1,x2,x3, x4, a=0.05, B=500)

equa4vartest(rexp(10) ,rexp(10) ,rexp(10) , rexp(10)), a=0.01, B=1000)
```
Description
Tests the hypothesis that 2, 3, or 4 population variances are homogeneous or not using bootstrap.

Details
Reference:

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