

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}.

License GPL (>= 3)

Encoding UTF-8

Imports stats

RoxygenNote 7.2.3

NeedsCompilation no

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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

<code>x1</code>	first sample vector of data or observations
<code>x2</code>	second sample vector of data or observations
<code>a</code>	significance level alpha
<code>B</code>	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

Cahoy, DO (2010), *A Bootstrap Test For Equality Of Variances*, Computational Statistics & Data Analysis, 54(10), 2306-2316. doi:[10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

Examples

```
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

<code>x1</code>	first sample vector of data or observations
<code>x2</code>	second sample vector of data or observations
<code>x3</code>	third sample vector of data or observations
<code>a</code>	significance level alpha
<code>B</code>	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

Cahoy, DO (2010), *A Bootstrap Test For Equality Of Variances*, Computational Statistics & Data Analysis, 54(10), 2306-2316. doi:[10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

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

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

Arguments

<code>x1</code>	first sample vector of data or observations
<code>x2</code>	second sample vector of data or observations
<code>x3</code>	third sample vector of data or observations
<code>x4</code>	fourth sample vector of data or observations
<code>a</code>	significance level alpha
<code>B</code>	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

Cahoy, DO (2010), *A Bootstrap Test For Equality Of Variances*, Computational Statistics & Data Analysis, 54(10), 2306-2316. doi:10.1016/j.csda.2010.04.012

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) )
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)
```

testequavar

testequavar Package

Description

Tests the hypothesis that 2, 3, or 4 population variances are homogeneous or not using bootstrap.

Details

Reference:

Cahoy (2010) [doi:10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

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