Package ‘dbEmpLikeNorm’

February 19, 2015

Version  1.0.0
Date     Apr 12, 2013
Title    Test for joint assessment of normality
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Depends  R (>= 2.10), dbEmpLikeGOF
Description Test for joint assessment of normality
LazyData no
License  GPL (>= 2)

URL
NeedsCompilation no
Repository CRAN
Date/Publication 2013-04-25 16:50:23

R topics documented:

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dbEmpLikeNorm-package  Empirical Likelihood Joint Assessment of Normality

Description

Package that has functions to perform a joint assessment of normality across \( k \) groups

Author(s)

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References


See Also

dbELnorm, returnCutoffValue

datamat  Pvalue Data Tables

Description

Stores cutoff information for different target alpha values and various sets of data of varying sample size.

Format

data.frame with columns equal to sample size information and rows equal to different target alpha values.

Details

This file contains cutoff information for different target alpha (Type I error) values and various sets of data of varying sample size. Note: twoGroup is for data consisting of two group, threeGroup is for data consisting of three groups. These tables are generated for sample sizes 10, 25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, and 300. The target alphas range from .001 to .999 in increments of .001. The default value for delta is 0.5, See [Tsai 2013] for details on setting delta.
**dbELnorm**

**Note**

This dataset is used within the functions. There is no need for the user to call this dataset.

**References**


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**dbELnorm**

*Goodness of Fit Test for Normality Among Multiple Groups*

**Description**

Performs density based empirical likelihood goodness of fit tests for normality among multiple groups.

**Usage**

\[ dbELnorm(x, \text{delta}=0.05, \text{num.mc}=1000, \text{pvl.Table}=\text{TRUE}, \text{vrb}=\text{TRUE}) \]

**Arguments**

- **x** list of groups or experiments
- **delta** an option for changing the minimizing range for the EL ratio test statistic
- **num.mc** number of simulations to use when calculating p-value
- **pvl.Table** logical indicating if p-value should be calculated based on estimates from stored data tables or by using Monte Carlo techniques
- **vrb** logical indicating if status messages should be printed

**Details**

The method employs a density-based empirical likelihood approach to obtain the test statistic and p-values for a goodness-of-fit tests for normality. The null distribution is that the data in \( x \) is normally distributed with possibly different means and standard deviations.

\( 'x' \) is a list object where each item in the list is a different set of data.

The ’delta’ value must be in the range \([0,1]\). Essentially this setting controls the range over which a minimum is taken to produce the EL ratio test statistic. The range is from 1 to \( n^{\delta}\) where \( n \) represents the number of observations in ’\( x'\). The ’pvl.Table’ is a binary option where when TRUE, the p-value for the test statistic is determined by imputation from a stored table of test statistics and significance levels for common sample sizes. If ’pvl.Table’ is FALSE, then the p-value is determined from Monte-Carlo simulations where the number of resamplings is set by ’num.mc’. 
Value

Returns a vector of length 2 with test statistic and p-value.

teststat the value of the test statistic
pvalue the p-value for the test

Author(s)

Lori A. Shepherd, Wan-Min Tsai, Albert Vexler, Jeffrey C. Miecznikowski

References


Examples

```r
x = rnorm(30, 3,1)
y = rnorm(40, 4,1)
Lst = list(x,y)
dbELnorm(Lst)
```

```r
y = runif(40)
Lst = list(x,y)
dbELnorm(Lst)
```

returnCutoffValue

Estimates The Statistic Cutoff For A Target Alpha

Description

estimates the test statistic cutoff for significance

Usage

```r
returnCutoffValue(numberOfgroups, sample.size, targetalpha=0.05, MC.Method=TRUE, Table.Method=FALSE, Bayes.Method=FALSE, num.mc=1000, delta=0.05, nsims=200, v.threshold=NA)
```
Arguments

- `numberOfgroups`: number of different groups or experiments.
- `sample.size`: number of observations.
- `targetalpha`: The significance level for the test.
- `MC.Method`: logical indicating if value should be calculated based on Monte Carlo techniques.
- `Table.Method`: logical indicating if value should be calculated based on estimates from generated data table.
- `Bayes.Method`: logical indicating if value should be calculated using a Bayesian method incorporating elements of MC.Method and Table.Method.
- `num.mc`: number of simulations to estimate distribution of statistic in MC.Method.
- `delta`: an option for changing the minimizing range for the EL ratio test statistic for the distribution. Utilized in MC.Method.
- `nsims`: The number of simulations to generate and investigate in each turn of Bayesian approach.
- `v.threshold`: a numeric threshold for the variance. This threshold must be met to accept calculated value of Bayesian approach. If NA, a variance estimate is calculated and used as threshold.

Details

This function is designed to return the cut-off for significance for the statistics obtained from the density-based EL tests. The significance level for the associated cutoffs are specified by the user in 'targetalpha'.

The 'numberOfgroups' is a scalar denoting the number of groups or datasets being tested. The 'sample.size' should be a vector of length equal to the 'numberOfgroups' where sample.size[1] is the number of observations for group 1, sample.size[2] is the number of observations for group 2, etc. If only a single 'sample.size' is specified, it is assumed groups are of equal length.

MC.Method, Table.Method, and Bayes.Method are binary options. When MC.Method is TRUE, the cutoff is determined from a Monte-Carlo simulation where the number of resamplings is controlled by 'num.mc'. When Table.Method is TRUE, the cutoff is determined by imputation from a stored table of test statistics and significance levels for common sample sizes. When Bayes.Method is TRUE, the cutoff is determined through a Bayesian approach where the number of additional observations is controlled by nsims, and the threshold for acceptance is controlled by 'v.threshold'. See [Tsai 2013] for more details on the algorithm.

The 'delta' value must be in the range [0,1]. Essentially this setting controls the range over which a minimum is taken to produce the EL ratio test statistic. The range is from 1 to \( n^{(1-'delta')} where 'n' represents the number of observations in 'x'.

Value

Returns a statistical cutoff value to assess significance at level 'targetalpha'. If more than one method is selected, a list with value for each method is returned. If only one method is selected, a single numeric value for that method is returned.
Author(s)
Lori A. Shepherd, Wan-Min Tsai, Albert Vexler, Jeffrey C. Miecznikowski

References

Examples

```
returnCutoffValue(3, c(10,15,40), MC.Method=TRUE)
returnCutoffValue(3, c(10,15,40), MC.Method=TRUE, Bayes.Method=TRUE, Table.Method=TRUE)
```
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