Package 'RDnp'

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Type Package

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Title Robust Test for Complete Independence in High-Dimensions

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Author Hasan BULUT [aut,cre]

Maintainer Hasan BULUT <hasan.bulut@omu.edu.tr>

Description Test Statistics for Independence in High-Dimensional Datasets. This package consists of two functions to perform the complete independence test based on test statistics proposed by Bulut (unpublished yet) and suggested by Najarzadeh (2021) <doi:10.1080/03610926.2019.1702699>. The Bulut's statistic is not sensitive to outliers in high-dimensional data, unlike one of Najarzadeh (2021) <doi:10.1080/03610926.2019.1702699>. So, the Bulut's statistic can be performed robustly by using RDnp function.

License GPL-2

Depends R (>= 4.0)

Imports cellWise, MASS

Encoding UTF-8

RoxygenNote 7.1.1

NeedsCompilation no

Repository CRAN

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Contents

Dnp_Test *Test for Independence in High-Dimensional Data*

Description

A Test Statistic for Independence in High-Dimensional Datasets

Usage

```
Dnp_Test(X)
```

Arguments

X	the data. It must be matrix.

Details

Dnp_Test function tests the complete independence in high-dimensional data sets. This statistic was proposed by Najarzadeh (2021).

Value

a list with 2 elements:

TestValue	The value of test statistic
pval	The p value
robust	Logical. Indicates whether the results are based on robust statistic. Here, it returns robust=FALSE

Author(s)

Hasan BULUT <hasan.bulut@omu.edu.tr>

References

Najarzadeg, D (2021). Testing independece in high-dimensional multivariate normal data, Communication in Statistics: Theory and Methods. 50 (14): 3421-3435.

Examples

```
# Under H0
library(MASS)
data_H0<-mvrnorm(n = 20,mu = rep(0,30),Sigma = diag(30))
Dnp_Test(data_H0)

# Under H1
library(MASS)
data_H1<-mvrnorm(n = 20,mu = rep(0,30),Sigma = (diag(30)+1))
Dnp_Test(data_H1)
```

RDnp_Test *Robust Test for Independence in High-Dimensional Data*

Description

A Robust Test Statistic for Independence in High-Dimensional Datasets

Usage

```
RDnp_Test(X, alpha = 0.75)
```

Arguments

X	the data. It must be matrix.
alpha	numeric parameter. It gives the rate of uncontaminated observations. Allowed values are between 0.5 and 1 and the default is 0.75.

Details

RDnp_Test function tests the complete independence in high-dimensional data sets without being affected by outliers.

Value

a list with 2 elements:

TestValue	The value of test statistic
pval	The p value
robust	Logical. Indicates whether the results are based on robust statistic. Here, it returns robust=TRUE

Author(s)

Hasan BULUT <hasan.bulut@omu.edu.tr>

References

Bulut, H (Unpublished). A Robust Test Statistic for Independence in High Dimensional Data

Examples

```
# Under H0
library(MASS)
data_H0<-mvrnorm(n = 20,mu = rep(0,30),Sigma = diag(30))
RDnp_Test(data_H0)

# Under H1
library(MASS)
```

```
data_H1<-mvrnorm(n = 20,mu = rep(0,30),Sigma = (diag(30)+1))
RDnp_Test(data_H1)
```

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