Package ‘Peacock.test’

October 12, 2022

Type Package

Title Two and Three Dimensional Kolmogorov-Smirnov Two-Sample Tests

Version 1.0

Date 2016-07-13

Author Yuanhui Xiao

Maintainer Yuanhui Xiao <xiao_yuanhui@hotmail.com>

Description The original definition of the two and three dimensional Kolmogorov-Smirnov two-sample test statistics given by Peacock (1983) is implemented. Two R-functions: peacock2 and peacock3, are provided to compute the test statistics in two and three dimensional spaces, respectively. Note the Peacock test is different from the Fasano and Franceschini test (1987). The latter is a variant of the Peacock test.

License GPL-2

NeedsCompilation no

Repository CRAN

Date/Publication 2016-07-14 20:33:50

R topics documented:

  Peacock.test-package ........................................ 2
  gcd ............................................................. 3
  peacock2 ....................................................... 4
  peacock3 ....................................................... 4

Index 6
Description

Two R-functions: peacock2 and peacock3 are provided to compute the two dimensional and three dimensional KS two-sample tests, respectively. The famous KS two sample test was generalized to multidimensional spaces by Peacock (1983). Hence, it is also called the Peacock test. The Peacock is different from the widely used Fasano and Franceschini test (1987). The latter is a variant of the KS test, invented to alleviate the computational intensity of the former. The two R-functions implement the original definition of the KS test given by Peacock (1983).

Details

<table>
<thead>
<tr>
<th>Package</th>
<th>Peacock.test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Package</td>
</tr>
<tr>
<td>Version</td>
<td>1.0</td>
</tr>
<tr>
<td>Date</td>
<td>2016-07-13</td>
</tr>
<tr>
<td>License</td>
<td>GPL-2</td>
</tr>
</tbody>
</table>

The two functions: peacock2 and peacock3, provided in this package are self-explanatory and their usage is straightforward.

Author(s)

Yuanhui Xiao

Maintainer: Yuanhui Xiao <xiao\_yuanhui@hotmail.com>  ~~ The author and/or maintainer of the package ~~

References


Examples

# two-dimensional case
x2 <- matrix(rnorm(12, 0, 1), ncol=2)
y2 <- matrix(rnorm(16, 0, 1), ncol=2)
ks2 <- peacock2(x2, y2)
ks2
# three-dimensional case
```r
x3 <- matrix(rnorm(12, 0, 1), ncol=3)
y3 <- matrix(rnorm(18, 0, 1), ncol=3)
ks3 <- peacock3(x3, y3)
ks3
```

---

## gcd

### Greatest Common Divisor

**Description**

This function returns the greatest common divisor of two integers.

**Usage**

```r
gcd(x, y)
```

**Arguments**

- `x`: a nonnegative integer
- `y`: a nonnegative integer

**Details**

The function utilizes the Euclidean algorithm to compute the greatest common divisor of two integers.

**Value**

An integer, which is the greatest common divisor. If both arguments are zero, then the returned value is 1.

**Author(s)**

Yuanhui Xiao

**Examples**

```r
x <- 4
y <- 6
d <- gcd(x, y)
d
```
peacock2

*Two Dimensional Kolmogorov-Smirnov/Peacock Two-Sample test*

**Description**

This function implements the original definition of the two-dimensional Kolmogorov-Smirnov test by Peacock (1983). This test is not the widely used Fasano-Franceschini test (1987). The latter is a variant of the Peacock test.

**Usage**

`peacock2(x, y)`

**Arguments**

- `x` : x is the object representing the first sample. x should be able to be converted to a matrix, where each row represents a sample point. If the object cannot be converted to a matrix, the function will stop and throw an error message. Please note that only the first two columns of the matrix will be used, and the rest columns are just ignored.

- `y` : Similar to x, y is the object representing the second sample.

**Value**

the value of the test statistic

**Author(s)**

Yuanhui Xiao

**Examples**

```r
x <- matrix(rnorm(12, 0, 1), ncol=2)
y <- matrix(rnorm(16, 0, 1), ncol=2)
ks <- peacock2(x, y)
ks
```

---

peacock3

*Three Dimensional Kolmogorov-Smirnov/Peacock Two-Sample test*

**Description**

This function implements the original definition of the three-dimensional Kolmogorov-Smirnov test by Peacock (1983). This test is not the widely used Fasano-Franceschini test (1987). The latter is a variant of the Peacock test.
**Usage**

peacock3(x, y)

**Arguments**

- **x**
  - x is the object representing the first sample. x should be able to be converted to a matrix, where each row represents a sample point. If the object cannot be converted to a matrix, the function will stop and throw an error message. Please note that only the first three columns of the matrix will be used, and the rest columns are just ignored.

- **y**
  - Similar to x, y is the object representing the second sample.

**Value**

the value of the test statistic

**Author(s)**

Yuanhui Xiao

**Examples**

```r
x <- matrix(rnorm(12, 0, 1), ncol=3)
y <- matrix(rnorm(18, 0, 1), ncol=3)
ks <- peacock3(x, y)
ks
```
Index

* Fasano-Franceschini Two-Sample test
  Peacock.test-package, 2
* Kolmogorov-Smirnov/Peacock Two-Sample test
  Peacock.test-package, 2
* Three-dimensional Fasano-Franceschini Two-Sample test
  peacock3, 4
* Three-dimensional Kolmogorov-Smirnov/Peacock Two-Sample test
  peacock3, 4
* Two-dimensional Fasano-Franceschini Two-Sample test
  peacock2, 4
* Two-dimensional Kolmogorov-Smirnov/Peacock Two-Sample test
  peacock2, 4
* greatest common divisor
  gcd, 3

gcd, 3

Peacock.test (Peacock.test-package), 2
Peacock.test-package, 2
peacock2, 4
peacock3, 4