Package 'TwoCop'

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Type Package

Title Nonparametric test of equality between two copulas

Version 1.0

Date 2012-10-17

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Description This package implements the nonparametric test of equality between two copulas proposed by Remillard and Scaillet in their 2009 JMVA paper.

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`TwoCop-package` *Nonparametric test of equality between two copulas*

Description

This package implements the nonparametric test of equality between two copulas proposed by Remillard and Scaillet (2009) in their JMVA paper. The test is based on the Cramer-von-Mises statistic between the two empirical copulas. An approximate p-value is returned.

Details

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Version:	1.0
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License:	GPL-2

The function TwoCop provides an approximate p-value for the test of equality between two copulas.

Author(s)

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References

Remillard, B. & Scaillet, O. (2009) Testing for equality between two copulas. Journal of Multivariate Analysis, 100, 377-386.

TwoCop *Nonparametric test of equality between two copulas*

Description

This function performs the nonparametric test of equality between two copulas proposed by Remillard and Scaillet (2009). The test is based on the Cramer-von-Mises statistic between the two empirical copulas. An approximate p-value is returned.

Usage

```
TwoCop(x, y, Nsim=100, paired=FALSE, alpha=0.95)
```

Arguments

x	n by d matrix containing the first dataset.
y	m by d matrix containing the second dataset.
Nsim	Number of iterations used in the approximation of the p-value.
paired	FALSE (default) means that x and y are from two independent populations, TRUE indicates paired data.
alpha	Level of the calculated VaR. Default is 0.95.

Details

Details of the method can be found in Remillard and Scaillet (2009).

Value

A list of the following objects:

`cvm`	Value of the Cramer-von Mises test statistic.
`pvalue`	pvalue based on the multiplier Monte Carlo method with `Nsim` iterations.
`cvmsim`	Simulated values of the Cramer-von Mises statistic.
`VaR`	`alpha` quantile of the simulated Cramer-von Mises statistics.

Author(s)

Bruno Remillard and Jean-Francois Plante

References

Remillard, B. & Scaillet, O. (2009) Testing for equality between two copulas. Journal of Multivariate Analysis, 100, 377-386.

Examples

```
# Simulating a bivariate normal (copula = independence)

  X=matrix(rnorm(100),ncol=2)

# Simulating a bivriate exponential distribution with a Clayton copula

  v=runif(50)
  theta=1
  x<-1/(1/runif(50)/v^(theta+1))^(1/(theta+1))
  u<-(x^(-theta)-v^(-theta)+1)^(-1/theta)
  Y=cbind(-log(1-u),-log(1-v))

# Testing equality of the copulas

  TwoCop(X,Y)$pvalue
```

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