Package ‘depth.plot’

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Description Could be used to obtain spatial depths, spatial ranks and outliers of multivariate random variables. Could also be used to visualize DD-plots (a multivariate generalization of QQ-plots).
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dd.plot

Depth-Depth Plots

Description

dd.plot is a multivariate generalization of a normal QQ-plot. It produces a DD-plot of two datasets.

Usage

dd.plot(data1, data2 = rmvnorm(nrow(data1), array(0, ncol(data1)), diag(1, ncol(data1), ncol(data1))), main = "Normal DD-plot", xlab = "Sample Depths", ylab = "Normal Depths", col = "black", pch = 20)

Arguments

data1 A matrix or a data.frame with each row as a p-variate observation.
data2 A matrix or a data.frame (defaults to a standard independent p-variate normal).
main Plot labels. The title of the plot.
xlab Plot labels. The x-axis label of the plot.
ylab Plot labels. The y-axis label of the plot.
col The color of the points
pch character string or vector of 1-characters or integers for plotting characters.

Value

A DD-plot of the input data

Author(s)

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See Also

spatial.depth

Examples

u<-matrix(rnorm(300,1,4),ncol=3)
dd.plot(u)
multi.quant

**Multiivariate Quantile**

**Description**

Used to compute the p-variate quantile of a p-variate observation with respect to a p-variate data cloud.

**Usage**

```r
multi.quant(x, data)
```

**Arguments**

- `x` A numeric p-variate spatial rank. Elements must lie within -1 and +1, with a 0-vector denoting the median.
- `data` A matrix or a data.frame with each row as a p-variate observation.

**Value**

The xth multivariate quantile with respect to data.

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**See Also**

`spatial.rank`

**Examples**

```r
u <- matrix(rnorm(90, 0, 1), ncol=3)
u0 <- runif(3, 0, 1)
multi.quant(spatial.rank(u0, u), u)
```
spatial.outlier

spatial.depth  

**Spatial Depth**

**Description**

spatial.depth is used to find the spatial depth of one or more p-variate observation(s) in a data cloud of numerous p-variate observations.

**Usage**

```
spatial.depth(x, data)
```

**Arguments**

- `x`  
  A matrix or a data.frame of objects (numerical vector as one object) whose depth is to be found; each row consists a p-variate observation.

- `data`  
  A matrix or a data.frame of objects which acts as the data cloud. Each row consists of a p-variate observation.

**Value**

Numerical vector of depths, one for each row in `x`; or one depth value if `x` is numerical.

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**Examples**

```r
u<-matrix(rnorm(90,0,1),ncol=3)
u0<-matrix(runif(9,0,1),ncol=3)
spatial.depth(u0,u)
```

spatial.outlier  

**Multivariate Spatial Outlier**

**Description**

spatial.outlier is used to find the multivariate spatial outlier within a p-variate data cloud or to identify if any p-variate observation is an outlier with respect to a p-variate data cloud.

**Usage**

```
spatial.outlier(data, x = data, threshold = 0.05)
```
spatial.rank

Arguments

- **data**: A matrix or a data.frame of p-variate observations which works as the data cloud.
- **x**: A matrix or a data.frame p-variate to test whether is an outlier with respect to the data. Defaults to data, to find outliers (if exists) within the data.
- **threshold**: A decimal threshold between 0 and 1 on the spatial.depth. Spatial depth values less than which will be considered as outlier. Defaults to 0.05. Usually taken as 0.1 or 0.05 or 0.01.

Value

- **FALSE**: If there does not exist any outlier
- A list with objects (If outliers exist)
- **index**: Returns the indices of the outliers
- **observation**: Returns the p-variate outliers

Author(s)

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Examples

```r
u <- matrix(rnorm(60, 0, 1), ncol = 3)
u0 <- matrix(runif(9, 3, 4), ncol = 3)
spatial.outlier(u, rbind(u, u0))
```

spatial.rank  Spatial Rank

Description

Used to compute the Spatial Rank of a p-variate observation with respect to a p-variate data cloud.

Usage

```r
spatial.rank(x, data)
```

Arguments

- **x**: A numeric p-variate vector whose spatial rank is to be calculated.
- **data**: A matrix or a data.frame with each row as a p-variate observation.

Value

The spatial rank of x with respect to data.
Author(s)

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Examples

u<-matrix(rnorm(90,0,1),ncol=3)
u0<-runif(3,0,1)
spatial.rank(u0,u)
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