Package: depth.plot (via r-universe)

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Type Package

Title Multivariate Analogy of Quantiles

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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).

Imports mvtnorm , stats , graphics

License GPL-2

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NeedsCompilation no

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Contents

dd.plot *Depth-Depth Plots*

Description

dd.plot is a multivariate genralization 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 *Multivariate Quantile*

Description

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

Usage

```
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 mutivariate quantile with respect to data.

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See Also

spatial.rank

Examples

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

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

```
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)
```

Arguments

data	A matrix or a data.frame of p-variate observations which works as the data cloud.
x	A matrix or a data.framep-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 doesnot exist any outlier

A list with objects (If outliers exist)

index :: Returns the indices of the outliers

observation :: Returns the p-variate outliers

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Examples

```
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

```
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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