

# Package ‘depth.plot’

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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

**RoxygenNote** 5.0.1

**NeedsCompilation** no

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`dd.plot`*Depth-Depth Plots*

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**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**

<code>data1</code>	A matrix or a data.frame with each row as a p-variate observation.
<code>data2</code>	A matrix or a data.frame (defaults to a standard independent p-variate normal).
<code>main</code>	Plot labels. The title of the plot.
<code>xlab</code>	Plot labels. The x-axis label of the plot.
<code>ylab</code>	Plot labels. The y-axis label of the plot.
<code>col</code>	The color of the points
<code>pch</code>	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)
```

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multi.quant	<i>Multivariate Quantile</i>
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**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 multivariate 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)
```

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spatial.depth	<i>Spatial Depth</i>
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**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.

**Author(s)**

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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)
```

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spatial.outlier	<i>Multivariate Spatial Outlier</i>
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**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.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 <code>spatial.depth</code> . 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))
```

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 spatial.rank

*Spatial Rank*


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**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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