

Package ‘shapeNA’

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Title What the Package Does (One Line, Title Case)

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Description What the package does (one paragraph).

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barplot.naBlocks	<i>Barplot showcasing missingness proportion of the original data</i>
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Description

Barplot showcasing missingness proportion of the original data

Usage

```
## S3 method for class 'naBlocks'  
barplot(obj, sortNA = FALSE)
```

plot.naBlocks	<i>plot missingness pattern of data</i>
---------------	---

Description

plot missingness pattern of data

Usage

```
## S3 method for class 'naBlocks'  
plot(x, orderProp = TRUE, ...)
```

plot.shapeNA	<i>Crude visualization of shape estimate</i>
--------------	--

Description

If estimate comes from missing data, additionally the columns are marked with a colored bar, indicating their missingness proportion

Usage

```
## S3 method for class 'shapeNA'
plot(obj, legend = TRUE, message = TRUE)
```

powerShape	<i>Compute shape estimate for full data</i>
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Description

Given a data matrix x from a continuous distribution, return a shape estimate and, if not supplied as center, a location estimate.

Usage

```
powerShape(x, alpha, center = NULL, normalization = c("det", "trace", "one"), maxiter = 1e4, tol = 1e-6)

tylerShape(x, center = NULL, normalization = c("det", "trace", "one"), maxiter = 1e4, tol = 1e-6)

classicShape(x, center = NULL, normalization = c("det", "trace", "one"), maxiter = 1e4, tol = 1e-6)
```

Arguments

<code>x</code>	numeric data matrix or data.frame without missing data. Representing sample from continuous distribution
<code>alpha</code>	numeric, determines power function
<code>center</code>	optional vector of center, if NULL the center will be estimated simultaneously to the shape estimate
<code>normalization</code>	string, determines scale of returned shape estimate
<code>maxiter</code>	integer, maximum number of iterations
<code>tol</code>	numeric, tolerance level

Value

a shapeNA object, which contains a shape and center estimate

References

Frahm, G., & Jaekel, U. (2010). A generalization of Tyler's M-estimators to the case of incomplete data. *Computational Statistics & Data Analysis*, 54(2), 374-393.

Frahm, G., Nordhausen, K., & Oja, H. (2020). M-estimation with incomplete and dependent multivariate data. *Journal of Multivariate Analysis*, 176, 104569.

See Also

powerShapeNA

tylerShapeNA

classicShapeNA

Examples

```
x <- mvtnorm::rmvt(100, toeplitz(seq(1, 0.1, length.out=5)))
res <- powerShape(x, alpha=0.67, normalization='one')
```

powerShapeNA

Compute tyler's shape estimate for incomplete data

Description

todo: add description here

Usage

```
powerShapeNA(x, alpha, center = NULL, normalization = c("det", "trace", "one"), maxiter = 1e4, tol = 1e-
```

```
tylerShapeNA(x, center = NULL, normalization = c("det", "trace", "one"), maxiter = 1e4, tol = 1e-6)
```

```
classicShapeNA(x, center = NULL, normalization = c("det", "trace", "one"), maxiter = 1e4, tol = 1e-6)
```

Arguments

x	data matrix or data.frame with missing data and more than 2 columns. Representing sample from continuous distribution and MCAR missingness
alpha	numeric, determines power function
center	optional vector of center, if NULL the center will be estimated simultaneously to the shape estimate
normalization	string, determines scale of returned shape estimate
maxiter	integer, maximum number of iterations
tol	numeric, tolerance level

Value

shape and center estimate

References

Frahm, G., & Jaekel, U. (2010). A generalization of Tyler's M-estimators to the case of incomplete data. *Computational Statistics & Data Analysis*, 54(2), 374-393.

Frahm, G., Nordhausen, K., & Oja, H. (2020). M-estimation with incomplete and dependent multivariate data. *Journal of Multivariate Analysis*, 176, 104569.

Examples

```
## generate data set with missing values
x <- mvtnorm::rmvt(100, toeplitz(seq(1, 0.1, length.out = 3)), df = 5)
y <- mice::ampute(x, mech='MCAR')$amp
## compute M-estimate
res <- powerShapeNA(y, alpha = 0.5)
summary(res)
```

print.naBlocks	<i>Print missingness pattern</i>
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Description

Print missingness pattern

Usage

```
## S3 method for class 'naBlocks'
print(obj)
```

print.shapeNA	<i>print method for elements of class shapeNA</i>
---------------	---

Description

Only print M-estimates and alpha level

Usage

```
## S3 method for class 'shapeNA'
print(obj)
```

```
print.summary.shapeNA print method for class summary.shapeNA
```

Description

print method for class summary.shapeNA

Usage

```
## S3 method for class 'summary.shapeNA'
print(obj, ...)
```

Arguments

obj	object returned from summary.shapeNA
...	further arguments

Value

invisibly return NULL

```
summary.shapeNA summary method for class shapeNA
```

Description

summary method for class shapeNA

Usage

```
## S3 method for class 'shapeNA'
summary(obj, ...)
```

Arguments

obj	an object of class shapeNA, usually from a call to powerShape or similar functions
...	further arguments

Value

object of class shapeNA

Examples

```
obj <- tylerShape(mvtnorm::rmvt(100, diag(3)))
summary(obj)
```

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