

Package ‘kpodclustr’

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Title Method for Clustering Partially Observed Data

Version 1.1

Description Software for k-means clustering of partially observed data from Chi, Chi, and Baraniuk (2016) <doi:10.1080/00031305.2015.1086685>.

URL <http://jocelynchi.com/kpodclustr>

Depends R (>= 3.1.0)

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R topics documented:

assign_clustpp	2
findMissing	2
initialImpute	3
kmpp	4
kpod	5
makeData	6

Index	7
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assign_clustpp *Function for assigning clusters to rows in a matrix*

Description

assign_clustpp Function for assigning clusters to rows in a matrix

Usage

```
assign_clustpp(X, init_centers, kmpp_flag = TRUE, max_iter = 20)
```

Arguments

X	Data matrix containing missing entries whose rows are observations and columns are features
init_centers	Centers for initializing k-means
kmpp_flag	(Optional) Indicator for whether or not to initialize with k-means++
max_iter	(Optional) Maximum number of iterations

Author(s)

Jocelyn T. Chi

Examples

```
p <- 2
n <- 100
k <- 3
sigma <- 0.25
missing <- 0.05
Data <- makeData(p,n,k,sigma,missing)
X <- Data$Missing
Orig <- Data$Orig

clusts <- assign_clustpp(Orig, k)
```

findMissing *Function for finding indices of missing data in a matrix*

Description

findMissing Function for finding indices of missing data in a matrix

Usage

```
findMissing(X)
```

Arguments

X Data matrix containing missing entries whose rows are observations and columns are features

Value

A numeric vector containing indices of the missing entries in X

Author(s)

Jocelyn T. Chi

Examples

```
p <- 2
n <- 100
k <- 3
sigma <- 0.25
missing <- 0.05
Data <- makeData(p,n,k,sigma,missing)
X <- Data$Missing
missing <- findMissing(X)
```

initialImpute

Function for initial imputation for k-means

Description

initialImpute Initial imputation for k-means

Usage

```
initialImpute(X)
```

Arguments

X Data matrix containing missing entries whose rows are observations and columns are features

Value

A data matrix containing no missing entries

Author(s)

Jocelyn T. Chi

Examples

```
p <- 2
n <- 100
k <- 3
sigma <- 0.25
missing <- 0.05
Data <- makeData(p,n,k,sigma,missing)
X <- Data$Missing
X_copy <- initialImpute(X)
```

kmpp

k-means++

Description

kmpp Computes initial centroids via kmeans++

Usage

```
kmpp(X, k)
```

Arguments

X Data matrix whose rows are observations and columns are features
k Number of clusters.

Value

A data matrix whose rows contain initial centroids for the k clusters

Examples

```
n <- 10
p <- 2
X <- matrix(rnorm(n*p),n,p)
k <- 3
kmpp(X,k)
```

kpod *Function for performing k-POD*

Description

kpod Function for performing k-POD, a method for k-means clustering on partially observed data

Usage

```
kpod(X, k, kmpp_flag = TRUE, maxiter = 100)
```

Arguments

X	Data matrix containing missing entries whose rows are observations and columns are features
k	Number of clusters
kmpp_flag	(Optional) Indicator for whether or not to initialize with k-means++
maxiter	(Optional) Maximum number of iterations

Value

cluster: Clustering assignment obtained with k-POD
cluster_list: List containing clustering assignments obtained in each iteration
obj_vals: List containing the k-means objective function in each iteration
fit: Fit of clustering assignment obtained with k-POD (calculated as 1-(total withinss/totss))
fit_list: List containing fit of clustering assignment obtained in each iteration

Author(s)

Jocelyn T. Chi

Examples

```
p <- 5
n <- 200
k <- 3
sigma <- 0.15
missing <- 0.20
Data <- makeData(p,n,k,sigma,missing)
X <- Data$Missing
Orig <- Data$Orig
truth <- Data$truth

kpod_result <- kpod(X,k)
kpodclusters <- kpod_result$cluster
```

`makeData`*Make test data*

Description

`makeData` Function for making test data

Usage

```
makeData(p, n, k, sigma, missing, seed = 12345)
```

Arguments

<code>p</code>	Number of features (or variables)
<code>n</code>	Number of observations
<code>k</code>	Number of clusters
<code>sigma</code>	Variance
<code>missing</code>	Desired missingness percentage
<code>seed</code>	(Optional) Seed (default seed is 12345)

Author(s)

Jocelyn T. Chi

Examples

```
p <- 2
n <- 100
k <- 3
sigma <- 0.25
missing <- 0.05

X <- makeData(p,n,k,sigma,missing)$Orig
```

Index

`assign_clustpp`, 2

`findMissing`, 2

`initialImpute`, 3

`kmpp`, 4

`kpod`, 5

`makeData`, 6