Package 'SpectralClMixed'

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Type Package

Title Spectral Clustering for Mixed Type Data

Version 1.0.1

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Description Performs cluster analysis of mixed-type data using Spectral Clustering, see F. Mbuga and, C. Tortora (2022) <doi:10.3390/stats5010001>.

License GPL (>= 2)

Depends R (>= 3.5)

Imports RSpectra, cluster, ggplot2, GGally

Encoding UTF-8

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NeedsCompilation no

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Repository CRAN

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R topics documented:

`mspec` *Preforms spectral clustering on mix typed data*

Description

Preforms spectral clustering of mix-type data

Usage

```
mspec(
  z,
  k = 2,
  sigma = c(20, 20),
  c_wt = NULL,
  starts = 10,
  its = 300,
  verbose = FALSE
)
```

Arguments

`z`	data to be clustered
`k`	the number of clusters.
`sigma`	vector of lower,upper bounds for sigma
`c_wt`	the category weights, is assigned to c(0.9999, 0.999, .99, seq(0.95, 0.05,-0.05), .01, 0.001, 0.0001) if null.
`starts`	the number of random starts
`its`	the max number of iterations for the kmeans algorithm
`verbose`	if you would like printed output during running of function

Value

A class SpectralClMixed list with components

`ct_wt`	the selected category weight
`bt/wt_ss`	the between divided by the within sum of squares
`tot_wt_ss`	the total within sum of squares
`cluster`	the cluster assignments
`data`	the original data

References

F. Mbuga and, C. Tortora. Spectral Clustering of Mixed-Type Data. *Stats*, 5(1) 2022

Examples

```
c1=data.frame(v1=rnorm(30,0),v2=rnorm(30,0),v3=factor(round(runif(30))+1))
c2=data.frame(v1=rnorm(30,2),v2=rnorm(30,4),v3=factor(round(runif(30))+4))
data=rbind(c1,c2)
res=mspec(data, k = 2)
summary(res)
plot(res)
```

`plot.SpectralClMixed` *Plots the output of mspec*

Description

Plots the output of the function mspec, which performs Spectral clustering for mixed type data. The function displays up to 10 variables on a parrallel coordinate plot and on a scatter plot matrix, with colors representing the clustering partition

Usage

```
## S3 method for class 'SpectralClMixed'
plot(x,cols=NULL,...)
```

Arguments

`x`	object of SpectralClMixed class, the output of mspec
`cols`	For datasets with more than 10 columns, columns to plot
`...`	other graphic parameters

Value

No return value,the function produces a parallel coordinate plot and a scatter plot matrix

Examples

```
ex1=mspec(iris,3)
 plot(ex1,cols=1:4)
```

`SpectralClMix` *SpectralClMix*

Description

Cluster analysis of mixed-type data using Spectral Clustering.

Author(s)

Felix Mbuga, Cristina Tortora, Zander Bonnet

References

F. Mbuga and, C. Tortora. Spectral Clustering of Mixed-Type Data. *Stats*, 5(1) 2022

`summary.SpectralClMixed` *Summarizes the output of mspec*

Description

Summarizes the output of mspec

Usage

```
## S3 method for class 'SpectralClMixed'
summary(object,...)
```

Arguments

`object`	object of SpectralClMixed class, the output of mspec
`...`	other optional parameters

Value

It displays: The selected categorical variables weight, The between divided by within sum of squares, The total within sum of squares, and the cluster size.

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