

Package ‘akmbiclust’

October 12, 2022

Title Alternating K-Means Biclustering

Version 0.1.0

Description Implements the alternating k-means biclustering algorithm in Fraiman and Li (2020) [arXiv:2009.04550](https://arxiv.org/abs/2009.04550).

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Depends R (>= 2.10)

NeedsCompilation no

Author Zichao Li [aut, cre],
Nicolas Fraiman [aut]

Maintainer Zichao Li <lizichao@live.unc.edu>

Repository CRAN

Date/Publication 2020-09-24 09:10:15 UTC

R topics documented:

| | |
|----------------------|----------|
| akmbiclust | 1 |
| Index | 3 |

| | |
|------------|---|
| akmbiclust | <i>Alternating k-means biclustering</i> |
|------------|---|

Description

This function uses the alternating k-means biclustering algorithm to extract the k biclusters in the matrix X. See the paper "Biclustering with Alternating K-Means" for more details.

Usage

```
akmbiclust(X, k, lambda = 0, nstart = 1)
```

Arguments

| | |
|--------|---|
| X | Data matrix. |
| k | The number of biclusters. |
| lambda | Regularization parameter. Default is 0. |
| nstart | The number of random initializations. Default is 1. |

Value

A list containing three objects:

| | |
|------------|---------------------------------------|
| row_labels | The bicluster labels of every row. |
| col_labels | The bicluster labels of every column. |
| loss | The loss of the produced biclusters. |

Author(s)

Nicolas Fraiman and Zichao Li

References

N. Fraiman and Z. Li (2020). Biclustering with Alternating K-Means. arXiv preprint arXiv:2009.04550.

Examples

```
# we create a 100 by 100 matrix X which has an underlying 2 by 2 block structure.
# The entries in the two 50 by 50 blocks on the top left and bottom right follow
# i.i.d. normal with mean 0 and variance 4. The entries in the two 50 by 50 blocks
# on the top right and bottom left follow i.i.d. normal with mean 0 and variance 1.

X <- matrix(rnorm(10000, 0, 1), 100, 100)
X[1:50, 1:50] <- matrix(rnorm(2500, 0, 2), 50, 50)
X[51:100, 51:100] <- matrix(rnorm(2500, 0, 2), 50, 50)

# Alternating k-means biclustering
# Result: perfect
result <- akmbiclust(X, 2, lambda = 0, nstart = 100)
result$row_labels
result$col_labels

# Separate k-means clustering on the rows and columns
# Result: random
kmeans(X, 2)$cluster
kmeans(t(X), 2)$cluster
```

Index

akmbiclust, 1