

# Package ‘ockc’

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**Type** Package

**Title** Order Constrained Solutions in k-Means Clustering

**Version** 1.1

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**Description** Extends 'flexclust' with an R implementation of order constrained solutions in k-means clustering (Steinley and Hubert, 2008, <[doi:10.1007/s11336-008-9058-z](https://doi.org/10.1007/s11336-008-9058-z)>).

**License** GPL-2 | GPL-3

**Depends** flexclust

**Imports** methods, parallel, modeltools, stats4

**Suggests** seriation

**NeedsCompilation** no

**Author** Sebastian Krey [aut, cre],  
Friedrich Leisch [aut],  
Sebastian Hoffmeister [ctb]

**Maintainer** Sebastian Krey <[sebastian.dev@skrey.net](mailto:sebastian.dev@skrey.net)>

**Repository** CRAN

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bootockc

*Bootstrap Order Constrained k-means Clustering***Description**

Runs ockc for different numbers of clusters on bootstrap replica of the original data (maintaining the supplied order) and returns corresponding cluster assignments, centroids and Rand indices comparing pairs of partitions.

**Usage**

```
bootockc(x, k, nboot = 100, order = NULL, correct = TRUE, seed = NULL,
         multicore = TRUE, verbose = FALSE, ...)
```

**Arguments**

|           |                                                                                                                                         |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|
| x, k, ... | Passed to <a href="#">ockc</a>                                                                                                          |
| nboot     | Number of bootstrap pairs (maintaining order).                                                                                          |
| order     | Order restriction of x. If NULL an initial run of ockc with order=NULL is run to calculate an order with seriate from package seriation |
| correct   | Logical, correct the index for agreement by chance?                                                                                     |
| seed      | If not NULL, a call to <code>set.seed()</code> is made before any clustering is done.                                                   |
| multicore | Use parallelization, if available. For examples and additional documentation see <a href="#">bootFlexclust</a> .                        |
| verbose   | Logical, show progress information during computations. Ignored if multicore=TRUE.                                                      |

**Value**

Returns an object of class "bootFlexclust".

**Author(s)**

Sebastian Krey

**See Also**

[ockc](#), [bootFlexclust](#), [stepFlexclust](#)

**Examples**

```
x <- rbind(cbind(rnorm(10, mean=0), rnorm(10, mean=0), rnorm(10, mean=0)),
           cbind(rnorm(10, mean=10), rnorm(10, mean=10), rnorm(10, mean=0)),
           cbind(rnorm(10, mean=10), rnorm(10, mean=0), rnorm(10, mean=10)),
           cbind(rnorm(10, mean=10), rnorm(10, mean=10), rnorm(10, mean=10))
           )
```

```
bockc <- bootockc(x, 2:4, nboot=4, order=c(1:10, 21:40, 11:20),
                 multicore=FALSE, verbose=FALSE)
bockc
```

ockc

*Order Contrained Solutions in k-Means Clustering***Description**

Calculates an order constrained clustering solution (default k-means) on a data matrix.

**Usage**

```
ockc(x, k, family = kccaFamily("kmeans"), order = NULL, control = NULL,
     save.data = FALSE, multicore = FALSE, ...)
```

**Arguments**

|           |                                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| x         | A numeric matrix of data.                                                                                                                                                                   |
| k         | An integer vector of number of clusters. For each element of k a clustering solution is computed (reusage of intermediate results makes this more efficient than individual calls of ockc). |
| family    | Object of class kccaFamily.                                                                                                                                                                 |
| order     | Order restriction of x. If NULL an order is calculated with <a href="#">seriate</a> from package <a href="#">seriation</a>                                                                  |
| control   | An object of class flexclustControl.                                                                                                                                                        |
| save.data | Save a copy of x in the return object?                                                                                                                                                      |
| multicore | Use parallelization, if available. For examples and additional documentation see <a href="#">bootFlexclust</a> .                                                                            |
| ...       | Additional options for <a href="#">seriate</a> for order calculation.                                                                                                                       |

**Author(s)**

Sebastian Krey, Friedrich Leisch, Sebastian Hoffmeister

**References**

Steinley, D. and Hubert, L. (2008). Order-Constrained Solutions in K-Means Clustering: Even Better Than Being Globally Optimal. *Psychometrika*, 73 (4), pp. 647-664.

**See Also**

[kcca](#)

**Examples**

```
x <- rbind(cbind(rnorm(10, mean=0), rnorm(10, mean=0), rnorm(10, mean=0)),
           cbind(rnorm(10, mean=10), rnorm(10, mean=10), rnorm(10, mean=0)),
           cbind(rnorm(10, mean=10), rnorm(10, mean=0), rnorm(10, mean=10)),
           cbind(rnorm(10, mean=10), rnorm(10, mean=10), rnorm(10, mean=10))
)

res <- ockc(x, k=4, nboot=4, order=c(1:10, 21:40, 11:20))
res
```

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