Package 'FactoInvestigate'

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Type Package

Title Automatic Description of Factorial Analysis

Version 1.8

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Description Brings a set of tools to help and automatically realise the description of principal component analyses (from 'FactoMineR' functions). Detection of existing outliers, identification of the informative components, graphical views and dimensions description are performed threw dedicated functions. The Investigate() function performs all these functions in one, and returns the result as a report document (Word, PDF or HTML).

Depends R (>= 4.0)

URL http://factominer.free.fr/reporting/

Imports FactoMineR, stats, methods, graphics, rmarkdown, parallel, ggplot2

License GPL (>= 2)

Encoding latin1

LazyLoad yes

NeedsCompilation no

Repository CRAN

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R topics documented:

`FactoInvestigate-package`

Automatic Description of Factorial Analysis

Description

Brings a set of tools to help and automatically realise the description of principal component analyses (from 'FactoMineR' functions). Detection of existing outliers, identification of the informative components, graphical views and dimensions description are performed threw dedicated functions. The Investigate() function performs all these functions in one, and returns the result as a report document (Word, PDF or HTML).

Details

The DESCRIPTION file:

Package:	FactoInvestigate
Type:	Package
Title:	Automatic Description of Factorial Analysis
Version:	1.8
Author:	Simon Thuleau, Francois Husson
Maintainer:	Francois Husson <husson@agrocampus-ouest.fr>
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License:	GPL (>= 2)
Encoding:	latin1
LazyLoad:	yes

Index of help topics:

An overview of how to use the package, including the most important functions

Author(s)

Simon Thuleau, Francois Husson

Maintainer: Francois Husson <husson@agrocampus-ouest.fr>

See Also

FactoMineR

`classif` *Classification description*

Description

Realise the hierachical ascending classification (HCPC function) of the individuals (or rows) and describe the specifications of each cluster.

Usage

```
classif(res, file = "", dim = 1:2, nclust = -1, selec = "contrib", coef = 1,
      mmax = 10, nmax = 10, figure.title = "Figure", graph = TRUE, options = NULL)
```

Arguments

res	an object of class PCA, CA or MCA.
file	the file path where to write the description in Rmarkdown langage. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to describe (by default the first plane).
nclust	an integer forcing the number of clusters desired. The value -1 return the clustering evaluated as the most appropriate (default).
selec	the selection criterion of individuals to plot on the graph.
coef	a numerical coefficient to adjust the selection rule (exemple : if equals 2, the threshold is 2 times higher, and thus more restrictive)
mmax	an integer giving the maximum number of individuals to illustrate each cluster (by defaut 10).
nmax	an integer giving the maximum number of variables to illustrate each cluster (by defaut 10).
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, the graph is ploted into the console.
options	a character string that gives the output options for the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linuw and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The selec argument is used in order to select a part of the individuals that are drawn and described. For example, you can use either :
- selec = 1:5 then the individuals numbered 1 to 5 are drawn.
- selec = c("name1","name5") then the individuals named name1 and name5 are drawn.
- selec = "contrib 10" then the 10 active or illustrative individuals that have the highest contribution on the 2 dimensions of the plane are drawn.
- selec = "contrib" then the optimal number of active or illustrative individuals that have the highest contribution on the 2 dimensions of the plane are drawn.
- selec = "cos2 5" then the 5 active or illustrative individuals that have the highest cos2 on the 2 dimensions of the plane are drawn.
- selec = "cos2 0.8" then the active or illustrative individuals that have a cos2 higher to 0.8 on the plane are drawn.
- selec = "cos2" then the optimal number of active or illustrative individuals that have the highest cos2 on the 2 dimensions of the plane are drawn.

The coef argument is used in order to adjust the selection of the individuals when based on selec = "contrib" or selec = "cos2". For example :
- if coef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if coef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Value

res.hcpc	the result of the HCPC function on the dimensions specified.

Author(s)

Simon Thuleau and Francois Husson

See Also

description

Examples

```
## Not run:
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
classif(res.pca, file = "PCA.Rmd")

data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
classif(res.ca, file = "CA.Rmd")

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
classif(res.mca, file = "MCA.Rmd")

## End(Not run)
```

---

createRmd *Create Rmarkdown file*

Description

Intialise a Rmarkdown file in which to write the results of the package functions.

Usage

```
createRmd(res, analyse = "PCA", file = "",
          document = c("word_document", "pdf_document", "html_document"))
```

Arguments

res	an object of class PCA, CA or MCA.
analyse	A character string corresponding to the method for which the Rmd is created
file	the file path where to write the description in Rmarkdown langage. If the file already exists, its content is overwritten. If not specified, the description is written in the console.
document	a character vector giving the document format desired between "word_document", "pdf_document" and "html_document".

Author(s)

Simon Thuleau and Francois Husson

See Also

writeRmd, readRmd

Examples

```
## Not run:
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
createRmd(res.pca, file = "PCA.Rmd", document = "pdf_document")

data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
createRmd(res.ca, file = "CA.Rmd", document = "html_document")

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
createRmd(res.mca, file = "MCA.Rmd", document = c("word_document", "pdf_document"))

## End(Not run)
```

---

description *Factorial dimensions description*

Description

Describe a couple of dimensions, giving the individuals specific to each dimension, and the variables that characterize each group of individuals.

Usage

```
description(res, file = "", dim = 1:2, desc = dim, Iselec = "contrib",
            Vselec = "cos2", Rselec = "cos2", Cselec = "cos2", Icoef = 1,
            Vcoef = 1, Rcoef = 1, Ccoef = 1, mmax = 10, nmax = 10)
```

Arguments

res	an object of class PCA, CA or MCA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane).
desc	a 2 dimensional numerical vector giving the factorial dimensions to describe (by default the dim value).

Iselec	the individuals to select; see the details section.
Vselec	the variables to select; see the details section.
Rselec	the rows to select (for a CA res object); see the details section.
Cselec	the columns to select (for a CA res object); see the details section.
Icoef	a numerical coefficient to adjust the individuals selection rule; see the details section.
Vcoef	a numerical coefficient to adjust the variables selection rule; see the details section.
Rcoef	a numerical coefficient to adjust the rows selection rule (for a CA res object); see the details section.
Ccoef	a numerical coefficient to adjust the columns selection rule (for a CA res object); see the details section.
mmax	an integer giving the maximum number of individuals to illustrate each cluster (by default 10).
nmax	an integer giving the maximum number of variables to illustrate each cluster (by default 10).

Details

The Iselec argument (respectively Vselec, Rselec or Cselec) is used in order to select a part of the elements that are drawn and described. For example, you can use either :
- Iselec = 1:5 then the individuals (respectively the variables, the rows or the columns) numbered 1 to 5 are drawn.
- Iselec = c("name1","name5") then the individuals (respectively the variables, the rows or the columns) named name1 and name5 are drawn.
- Iselec = "contrib 10" then the 10 active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "contrib" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 5" then the 5 active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 0.8" then the active or illustrative individuals (respectively the variables, the rows or the columns) that have a cos2 higher to 0.8 on the plane are drawn.
- Iselec = "cos2" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Icoef argument (respectively Vcoef, Rcoef or Ccoef) is used in order to adjust the selection of the elements when based on Iselec = "contrib" or Iselec = "cos2". For example :
- if Icoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Icoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

classif

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
description(res.pca, file = "PCA.Rmd", dim = 1:2)

## End(Not run)
```

---

dimActive *Number of active dimensions*

Description

Give the number of active elements used to build the factorial analysis : individuals (or rows) and variables (or columns)

Usage

```
dimActive(res)
```

Arguments

res	an object of class PCA, CA or MCA.

Author(s)

Simon Thuleau and Francois Husson

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
dimActive(res.pca)

## End(Not run)
```

dimRestrict *Significant dimensions identification*

Description

Evaluate the number of significant dimensions in the data.

Usage

```
dimRestrict(res, file = "", rand = NULL)
```

Arguments

res	an object of class PCA, CA or MCA.
file	the file path where to write the function execution in Rmarkdown language. If not specified, the description is written in the console.
rand	an optional vector of eigenvalues to compare the observation with. If NULL, use the result of the eigenRef function for comparison.

Value

ncp	the number of significant dimensions.

Author(s)

Simon Thuleau and Francois Husson

See Also

eigenRef, inertiaDistrib

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
dimRestrict(res.pca, file = "PCA.Rmd")

## End(Not run)
```

eigenRef *Reference eigen value*

Description

Compute the eigen values of random datasets, with the hypothesis of independence.

Usage

```
eigenRef(res, dim = NULL, q = 0.95, time = "10000L", parallel = TRUE)
```

Arguments

res	an object of class PCA, CA or MCA
dim	a numerical vector giving the factorial dimensions for with to compute the eigenvalues calculation.
q	the quantile of computed values to use as reference value (ie. the confidence about the signification of dimensions)
time	a character indicating the loop condition. This string is made of a number and a letter coupled. The number X with letter L means to compute X datasets exactly. The number X with letter s means to compute as many datasets as possible during approximativley X seconds.
parallel	a boolean : if TRUE, the computation uses map reduce on the processor cores to increase the performance. Useful for huge datasets

Value

datasets	the number of random datasets simulated.
quantile	the quantile used for the reference definition.
inertia	the reference inertia for the dimensions declared.

Author(s)

Simon Thuleau and Francois Husson

See Also

dimRestrict, inertiaDistrib

Examples

```
## Not run:
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
eigenRef(res.pca, q = 0.95, time = "10s")
```

```
data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
eigenRef(res.ca, q = 0.99, time = "10000L")

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
eigenRef(res.mca, dim = 1:8, q = 0.90, time = "10s")

## End(Not run)
```

`factoGraph` *Factorial graphs*

Description

Realise all optimised factorial graphs

Usage

```
factoGraph(res, file = "", dim = 1:2, hab = NULL, ellipse = TRUE, Iselec = "contrib",
           Vselec = "cos2", Rselec = "cos2", Cselec = "cos2", Mselec = "cos2",
           Icoef = 1, Vcoef = 1, Rcoef = 1, Ccoef = 1, Mcoef = 1,
           figure.title = "Figure", graph = TRUE, cex = 0.7,
   codeGraphInd = NULL, codeGraphVar = NULL ,codeGraphCA = NULL,
   options = NULL)
```

Arguments

`res`	an object of class PCA, CA or MCA
`file`	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
`dim`	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane)
`hab`	a variable name or index to use to color the individuals (or rows) among the variable categories.
`ellipse`	a boolean : if `TRUE`, ellipses are plotted with the coloration of individuals (or rows).
`Iselec`	the individuals to select ; see the details section
`Vselec`	the variables to select ; see the details section
`Rselec`	the rows to select (for a `CA` `res` object) ; see the details section
`Cselec`	the columns to select (for a `CA` `res` object) ; see the details section
`Mselec`	the supplementary variables to select ; see the details section
`Icoef`	a numerical coefficient to adjust the individuals selection rule ; see the details section

Vcoef	a numerical coefficient to adjust the variables selection rule ; see the details section
Rcoef	a numerical coefficient to adjust the rows selection rule (for a CA res object) ; see the details section
Ccoef	a numerical coefficient to adjust the columns selection rule (for a CA res object) ; see the details section
Mcoef	a numerical coefficient to adjust the supplementary variables selection rule ; see the details section
figure.title	the text label to add before graph title
graph	a boolean : if TRUE, graphs are plotted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
codeGraphInd	a character string corresponding to the code to use for the individuals graph.
codeGraphVar	a character string corresponding to the code to use for the variables graph.
codeGraphCA	a character string corresponding to the code to use for the CA graph.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The Iselec argument (respectively Vselec, Rselec or Cselec) is used in order to select a part of the elements that are drawn and described. For example, you can use either :
- Iselec = 1:5 then the individuals (respectively the variables, the rows or the columns) numbered 1 to 5 are drawn.
- Iselec = c("name1","name5") then the individuals (respectively the variables, the rows or the columns) named name1 and name5 are drawn.
- Iselec = "contrib 10" then the 10 active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "contrib" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 5" then the 5 active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 0.8" then the active or illustrative individuals (respectively the variables, the rows or the columns) that have a cos2 higher to 0.8 on the plane are drawn.
- Iselec = "cos2" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Icoef argument (respectively Vcoef, Rcoef or Ccoef) is used in order to adjust the selection of the elements when based on Iselec = "contrib" or Iselec = "cos2". For example :
- if Icoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Icoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

graphInd, graphHab, graphCA, graphVar, graphSup

Examples

```
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
## Not run:
factoGraph(res.pca)

require(FactoMineR)
data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
factoGraph(res.ca)

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
factoGraph(res.mca)

## End(Not run)
```

---

getParam *Factorial parameters*

Description

Get all the factorial object parameters

Usage

```
getParam(res)
```

Arguments

res	an object of class PCA, CA or MCA.

Value

data	the dataset.
ind	the number of individuals.
var	the number of variables.
row	the number of rows (CA).

col	the number of columns (CA).
ind.sup	the number of supplementary individuals.
quanti.sup	the number of quantitative supplementary variables.
quali.sup	the number of qualitative supplementary variables.
row.sup	the number of supplementary rows (CA).
col.sup	the number of supplementary columns (CA).
row.w	the weights of each row.
col.w	the weights of each columns.
scale	a boolean indicating if the variables are scaled or not.
ncp.mod	the number of component kept in the analysis object.
modalites	the list of factors for each qualitative variables.

Author(s)

Simon Thuleau and Francois Husson

See Also

whichFacto

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
getParam(res.pca)

## End(Not run)
```

---

graphCA *Correspondance Analysis factor map*

Description

Realise the Correspondence Analysis simultaneous graph

Usage

```
graphCA(res, file = "", dim = 1:2, Rselec = "cos2", Cselec = "cos2", Rcoef = 1,
        Ccoef = 1, figure.title = "Figure", graph = TRUE, cex = 0.7,
codeGraphCA = NULL,options = NULL)
```

Arguments

res	an object of class CA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane)
Rselec	the rows to select ; see the details section.
Cselec	the columns to select ; see the details section.
Rcoef	a numerical coefficient to adjust the rows selection rule ; see the details section.
Ccoef	a numerical coefficient to adjust the columns selection rule ; see the details section.
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are plotted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
codeGraphCA	a character string corresponding to the code to use for the CA graph.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The Rselec argument (respectively Cselec) is used in order to select a part of the elements that are drawn and described. For example, you can use either :
- Rselec = 1:5 then the rows (the columns) numbered 1 to 5 are drawn.
- Rselec = c("name1","name5") and then the rows (the columns) named name1 and name5 are drawn.
- Rselec = "contrib 10" then the 10 active or illustrative rows (the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Rselec = "contrib" then the optimal number of active or illustrative rows (the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Rselec = "cos2 5" then the 5 active or illustrative rows (the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Rselec = "cos2 0.8" then the active or illustrative rows (the columns) that have a cos2 higher to 0.8 on the plane are drawn.
- Rselec = "cos2" then the optimal number of active or illustrative rows (the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Rcoef argument (respectively Ccoef) is used in order to adjust the selection of the elements when based on Rselec = "contrib" or Rselec = "cos2". For example :
- if Rcoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Rcoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

factoGraph, graphInd, graphHab, graphVar, graphSup

Examples

```
require(FactoMineR)
data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
## Not run:
graphCA(res.ca)

## End(Not run)
```

---

graphHab *Colored factor graph*

Description

Realised the graph of individuals colored after a variable categories

Usage

```
graphHab(res, file = "", dim = 1:2, hab = NULL, ellipse = TRUE, Iselec = "contrib",
         Rselec = "cos2", Cselec = "contrib", Icoef = 1, Rcoef = 1, Ccoef = 1,
         figure.title = "Figure", graph = TRUE, cex = 0.7, options = NULL)
```

Arguments

res	an object of class PCA, CA or MCA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane).
hab	a variable name or index to use to color the individuals (or rows) among the variable categories.
ellipse	a boolean : if TRUE, ellipses are plotted with the coloration of individuals (or rows).
Iselec	the individuals to select ; see the details section.
Rselec	the rows to select (for a CA res object) ; see the details section.
Cselec	the columns to select (for a CA res object) ; see the details section.

Icoef	a numerical coefficient to adjust the individuals selection rule ; see the details section.
Rcoef	a numerical coefficient to adjust the rows selection rule (for a CA res object) ; see the details section.
Ccoef	a numerical coefficient to adjust the columns selection rule (for a CA res object) ; see the details section.
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are ploted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The Iselec argument (respectively Rselec or Cselec) is used in order to select a part of the elements that are drawn and described. For example, you can use either :
- Iselec = 1:5 then the individuals (respectively the rows or the columns) numbered 1 to 5 are drawn.
- Iselec = c("name1","name5") then the individuals (respectively the rows or the columns) named name1 and name5 are drawn.
- Iselec = "contrib 10" then the 10 active or illustrative individuals (respectively the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "contrib" then the optimal number of active or illustrative individuals (respectively the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 5" then the 5 active or illustrative individuals (respectively the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 0.8" then the active or illustrative individuals (respectively the rows or the columns) that have a cos2 higher to 0.8 on the plane are drawn.
- Iselec = "cos2" then the optimal number of active or illustrative individuals (respectively the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Icoef argument (respectively Rcoef or Ccoef) is used in order to adjust the selection of the elements when based on Iselec = "contrib" or Iselec = "cos2". For example :
- if Icoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Icoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

factoGraph, graphInd, graphCA, graphVar, graphSup

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
graphHab(res.pca)

## End(Not run)
```

---

graphInd *Individuals factor map*

Description

Realise the optimised individuals graph

Usage

```
graphInd(res, file = "", dim = 1:2, Iselec = "contrib", Icoef = 1,
         figure.title = "Figure", graph = TRUE, cex = 0.7,
 codeGraphInd = NULL, options=NULL)
```

Arguments

res	an object of class PCA or MCA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane).
Iselec	the individuals to select ; see the details section.
Icoef	a numerical coefficient to adjust the individuals selection rule ; see the details section.
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are plotted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
codeGraphInd	a character string corresponding to the code to use for the individuals graph.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The Iselec argument is used in order to select a part of the individuals that are drawn and described. For example, you can use either :
- Iselec = 1:5 and then the individuals numbered 1 to 5 are drawn.
- Iselec = c("name1","name5") then the individuals named name1 and name5 are drawn.
- Iselec = "contrib 10" then the 10 active or illustrative individuals that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "contrib" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 5" then the 5 active or illustrative individuals that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 0.8" then the active or illustrative individuals that have a cos2 higher to 0.8 on the plane are drawn.
- Iselec = "cos2" then the optimal number of active or illustrative individuals that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Icoef argument is used in order to adjust the selection of the individuals when based on Iselec = "contrib" or Iselec = "cos2". For example :
- if Icoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Icoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

factoGraph, graphHab, graphCA, graphVar, graphSup

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
graphInd(res.pca)

## End(Not run)
```

---

graphSup *Supplementary variables factor map*

Description

Realise the optimised graph of supplementary variables

Usage

```
graphSup(res, file = "", dim = 1:2, Mselec = "cos2", Mcoef = 1,
         figure.title = "Figure", graph = TRUE, cex = 0.7, options=NULL)
```

Arguments

res	an object of class PCA, CA or MCA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane).
Mselec	the supplementary variables to select ; see the details section.
Mcoef	a numerical coefficient to adjust the supplementary variables selection rule ; see the details section.
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are plotted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The Mselec argument is used in order to select a part of the illustrative variables that are drawn and described. For example, you can use either :
- Mselec = 1:5 then the illustrative variables numbered 1 to 5 are drawn.
- Mselec = c("name1","name5") then the illustrative variables named name1 and name5 are drawn.
- Mselec = "cos2 5" then the 5 illustrative variables that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Mselec = "cos2 0.8" then the illustrative variables that have a cos2 higher to 0.8 on the plane are drawn.
- Mselec = "cos2" then the optimal number of illustrative variables that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Mcoef argument is used in order to adjust the selection of the illustrative variables when based on Mselec = "cos2". For example :
- if Mcoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Mcoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

factoGraph, graphInd, graphHab, graphCA, graphVar

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
graphSup(res.pca)

## End(Not run)
```

---

graphVar *Variables factor map*

Description

Realise the optimised variables graph

Usage

```
graphVar(res, file = "", dim = 1:2, Vselec = "cos2", Vcoef = 1,
         figure.title = "Figure", graph = TRUE, cex = 0.7,
 codeGraphVar=NULL, options=NULL)
```

Arguments

res	an object of class PCA or MCA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane).
Vselec	the variables to select ; see the details section.
Vcoef	a numerical coefficient to adjust the variables selection rule ; see the details section.
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are plotted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
codeGraphVar	a character string corresponding to the code to use for the variables graph.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The Vselec argument is used in order to select a part of the variables that are drawn and described. For example, you can use either :
- Vselec = 1:5 then the variables numbered 1 to 5 are drawn.
- Vselec = c("name1","name5") then the variables named name1 and name5 are drawn.
- Vselec = "contrib 10" then the 10 active or illustrative variables that have the highest contribution on the 2 dimensions of the plane are drawn.
- Vselec = "contrib" then the optimal number of active or illustrative variables that have the highest contribution on the 2 dimensions of the plane are drawn.
- Vselec = "cos2 5" then the 5 active or illustrative variables that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Vselec = "cos2 0.8" then the active or illustrative variables that have a cos2 higher to 0.8 on the plane are drawn.
- Vselec = "cos2" then the optimal number of active or illustrative variables that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Vcoef argument is used in order to adjust the selection of the variables when based on Vselec = "contrib" or Vselec = "cos2". For example :
- if Vcoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Vcoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Author(s)

Simon Thuleau and Francois Husson

See Also

factoGraph, graphInd, graphHab, graphCA, graphSup

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
graphVar(res.pca)

## End(Not run)
```

---

inertiaDistrib *Inertia distribution analysis*

Description

Analysis of the inertia distribution among each axis, the amount and the significativity

Usage

```
inertiaDistrib(res, file = "", ncp = NULL, q = 0.95, time = "10000L",
        parallel = TRUE, figure.title = "Figure", graph = TRUE, options = NULL)
```

Arguments

res	an object of class PCA, CA or MCA.
file	the file path where to write the description in Rmarkdown language. If not specified, the description is written in the console.
ncp	an integer to force the number of dimension to analyse.
q	the quantile of computed values to use as reference value (ie. the confidence about the signification of dimensions).
time	a character indicating the loop condition. This string is made of a number and a letter coupled. The number X with letter L means to compute X datasets exactly. The number X with letter s means to compute as many datasets as possible during approximativley X seconds.
parallel	a boolean : if TRUE, the computation uses map reduce on the processor cores to increase the performance. Useful for huge datasets.
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are plotted.
options	a character string that gives the output options fir the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Value

ncp	the number of significant dimensions (or the dimensions kept).

Author(s)

Simon Thuleau and Francois Husson

See Also

dimRestrict, eigenRef

Examples

```
## Not run:
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
inertiaDistrib(res.pca, q = 0.95, time = "10s")

data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
inertiaDistrib(res.ca, q = 0.99, time = "10000L")
```

```
data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
inertiaDistrib(res.mca, dim = 1:8, q = 0.90, time = "10s")

## End(Not run)
```

Investigate *Resume factorial Analysis*

Description

Compute all the package functions : detection of outliers, evaluation of inertia distribution, dimensions description, classification and realisation of graphical views. All the results are written as Word, html or PDF documents.

Usage

```
Investigate(res, file = "Investigate.Rmd", document = c("html_document"),
            Iselec = "contrib", Vselec = "cos2", Rselec = "contrib",
            Cselec = "cos2", Mselec = "cos2", Icoef = 1, Vcoef = 1, Rcoef = 1,
            Ccoef = 1, Mcoef = 1, ncp = NULL, time = "10s", nclust = -1,
           mmax = 10, nmax = 10, hab = NULL, ellipse = TRUE, display.HCPC = TRUE,
            out.selec = TRUE, remove.temp = TRUE, parallel = TRUE, cex = 0.7,
openFile = TRUE, keepRmd = FALSE, codeGraphInd = NULL,
codeGraphVar=NULL, codeGraphCA = NULL, options = NULL,
language = "auto")
```

Arguments

res	a PCA, CA or MCA object.
file	the file path where to write the description in Rmarkdown language. If the file already exists, its content is overwritten. If not specified, the description is written in the console.
document	a character vector giving the document format desired between "word_document", "pdf_document" and "html_document".
Iselec	the individuals to select ; see the details section.
Vselec	the variables to select ; see the details section.
Rselec	the rows to select (for a CA res object) ; see the details section.
Cselec	the columns to select (for a CA res object) ; see the details section.
Mselec	the supplementary variables to select ; see the details section.
Icoef	a numerical coefficient to adjust the individuals selection rule ; see the details section.
Vcoef	a numerical coefficient to adjust the variables selection rule ; see the details section.

`Rcoef`	a numerical coefficient to adjust the rows selection rule (for a `CA` `res` object) ; see the details section.
`Ccoef`	a numerical coefficient to adjust the columns selection rule (for a `CA` `res` object) ; see the details section.
`Mcoef`	a numerical coefficient to adjust the supplementary variables selection rule ; see the details section.
`ncp`	an integer to force the number of dimension to analyse.
`time`	a character indicating the loop condition. This string is made of a number and a letter coupled. The number X with letter `L` means to compute X datasets exactly. The number X with letter `s` means to compute as many datasets as possible during approximativley X seconds.
`nclust`	an integer to force the number of cluster for the classification.
`mmax`	an integer giving the maximum number of individuals (or rows) to illustrate each group (by defaut 10).
`nmax`	an integer giving the maximum number of variables (or columns) to illustrate each group of individuals (by defaut 10).
`hab`	a variable name or index to use to color the individuals (or rows) among the variable categories.
`ellipse`	a boolean : if `TRUE`, ellipses are plotted with the coloration of individuals (or rows).
`display.HCPC`	a boolean : if `TRUE`, the function performs the classification.
`out.selec`	a boolean : if `TRUE`, the function performs the detection of outliers.
`remove.temp`	a boolean : if `TRUE`, the temporary files created are deleted after the function execution.
`parallel`	a boolean : if `TRUE`, the computation uses map reduce on the processor cores to increase the performance. Useful for huge datasets.
`cex`	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
`openFile`	Open the file with the appropriate application; TRUE by default
`keepRmd`	Keep the Rmd file; FALSE by default
`codeGraphInd`	a character string corresponding to the code to use for the individuals graph.
`codeGraphVar`	a character string corresponding to the code to use for the variables graph.
`codeGraphCA`	a character string corresponding to the code to use for the CA graph.
`options`	a character string that gives the output options fir the figures. If NULL, `options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5"` for linux and Mac and `options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5"` for Windows
`language`	possible values "auto", "en", or "fr": by default, "auto" detects the language (English or French), "en" for English and "fr" for "French"

Details

The Iselec argument (respectively Vselec, Rselec or Cselec) is used in order to select a part of the elements that are drawn and described. For example, you can use either :
- Iselec = 1:5 then the individuals (respectively the variables, the rows or the columns) numbered 1 to 5 are drawn.
- Iselec = c("name1","name5") then the individuals (respectively the variables, the rows or the columns) named name1 and name5 are drawn.
- Iselec = "contrib 10" then the 10 active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "contrib" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest contribution on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 5" then the 5 active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Iselec = "cos2 0.8" then the active or illustrative individuals (respectively the variables, the rows or the columns) that have a cos2 higher to 0.8 on the plane are drawn.
- Iselec = "cos2" then the optimal number of active or illustrative individuals (respectively the variables, the rows or the columns) that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Icoef argument (respectively Vcoef, Rcoef or Ccoef) is used in order to adjust the selection of the elements when based on Iselec = "contrib" or Iselec = "cos2". For example :
- if Icoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Icoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Value

the function creates and opens a Word, html or PDF document that contains all the descriptions of analysis.

Author(s)

Simon Thuleau and Francois Husson

Examples

```
require(FactoMineR)
data(decathlon)
## Not run:
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
Investigate(res.pca, file = "PCA.Rmd", document = "html_document", time = "1000L",
            parallel = FALSE)

data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
Investigate(res.ca, file = "CA.Rmd", document = "pdf_document")

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
```

```
Investigate(res.mca, file = "MCA.Rmd", document = c("word_document", "pdf_document"))

## End(Not run)
```

---

outliers *Outliers detection*

Description

Detection of singular individuals that concentrates too much inertia.

Usage

```
outliers(res, file = "", Vselec = "cos2", Vcoef = 1, nmax = 10,
         figure.title = "Figure", graph = TRUE, cex = 0.7, options = NULL)
```

Arguments

res	an object of class PCA or MCA.
file	a numerical vector giving the factorial dimensions for with to compute the eigen values calculation.
Vselec	the variables to select ; see the details section.
Vcoef	a numerical coefficient to adjust the variables selection rule ; see the details section.
nmax	an integer giving the maximum number of variables to illustrate each outlier (by default 10).
figure.title	the text label to add before graph title.
graph	a boolean : if TRUE, graphs are plotted.
cex	an optional argument for the generic plot functions, used to adjust the size of the elements plotted.
options	a character string that gives the output options for the figures. If NULL, options="r, echo = FALSE, fig.align = 'center', fig.height = 3.5, fig.width = 5.5" for linux and Mac and options="r, echo = FALSE, fig.height = 3.5, fig.width = 5.5" for Windows

Details

The algorithm detects an individual as an outlier if its contribution to the plane if higher to 3 standard deviation.

The Vselec argument is used in order to select a part of the variables that are drawn and described. For example, you can use either :
- Vselec = 1:5 then the variables numbered 1 to 5 are drawn.
- Vselec = c("name1","name5") then the variables named name1 and name5 are drawn.

- Vselec = "contrib 10" then the 10 active or illustrative variables that have the highest contribution on the 2 dimensions of the plane are drawn.
- Vselec = "contrib" then the optimal number of active or illustrative variables that have the highest contribution on the 2 dimensions of the plane are drawn.
- Vselec = "cos2 5" then the 5 active or illustrative variables that have the highest cos2 on the 2 dimensions of the plane are drawn.
- Vselec = "cos2 0.8" then the active or illustrative variables that have a cos2 higher to 0.8 on the plane are drawn.
- Vselec = "cos2" then the optimal number of active or illustrative variables that have the highest cos2 on the 2 dimensions of the plane are drawn.

The Vcoef argument is used in order to adjust the selection of the variables when based on Vselec = "contrib" or Vselec = "cos2". For example :
- if Vcoef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if Vcoef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Value

new.res	the res object without the outliers (they are completely eliminated).
res.out	the res object with the outliers as supplementary individuals.
memory	the original res object.
N	the number of outliers.
ID	the label of outliers.

Author(s)

Simon Thuleau and Francois Husson

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
outliers(res.pca, file = "PCA.Rmd")

## End(Not run)
```

---

readRmd *Read Rmarkdown file*

Description

Compile and open a Rmarkdown file.

Usage

```
readRmd(file, document = "html_document")
```

Arguments

file	the file path where to write the description in Rmarkdown langage. If not specified, the description is written in the console.
document	a character vector giving the document format desired between "word_document", "pdf_document" and "html_document". This have to be any of those indicated in the file config (by createRmd).

Author(s)

Simon Thuleau and Francois Husson

See Also

createRmd, writeRmd

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
create.rmd(res.pca, file = "PCA.Rmd", document = "pdf_document")
readRmd(file = "PCA.Rmd", document = "pdf_document")

data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
create.rmd(res.ca, file = "CA.Rmd", document = "html_document")
readRmd(file = "CA.Rmd", document = "html_document")

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
create.rmd(res.mca, file = "MCA.Rmd", document = c("word_document", "pdf_document"))
readRmd(file = "MCA.Rmd", document = "word_document")

## End(Not run)
```

---

scriptRmd *File script*

Description

Read the script of a file and return each line as a character chain

Usage

```
scriptRmd(file, output = "code.R")
```

Arguments

file	the file path to read.
output	the file path to write the R code.

Author(s)

Simon Thuleau and Francois Husson

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
create.rmd(res.pca, file = "PCA.Rmd", document = "pdf_document")
scriptRmd(file = "PCA.Rmd")

data(children)
res.ca = CA(children, row.sup = 15:18, col.sup = 6:8, graph = FALSE)
create.rmd(res.ca, file = "CA.Rmd", document = "html_document")
scriptRmd(file = "CA.Rmd")

data(tea)
res.mca = MCA(tea, quanti.sup = 19,quali.sup = 20:36, graph = FALSE)
create.rmd(res.mca, file = "MCA.Rmd", document = c("word_document", "pdf_document"))
scriptRmd(file = "MCA.Rmd")

## End(Not run)
```

---

selection *Graphical elements selection*

Description

Select the best elements to plot in a graph

Usage

```
selection(res, dim = 1:2, margin = 1, selec = "cos2", coef = 1)
```

Arguments

res	an object of class PCA, CA or MCA.
dim	a 2 dimensional numerical vector giving the factorial dimensions to use for the representation (by default the first plane).
margin	an integer (by default 1). If equals 1, the function computes on the individuals (or rows). If equals 2, the function computes on the active variables (or columns). If equals 3, the function computes on the supplementary variables.

selec	the elements to select ; see the details section.
coef	a numerical coefficient to adjust the elements selection rule ; see the details section.

Details

The selec argument is used in order to select a part of the elements that are drawn and described. For example, you can use either :
- selec = 1:5 then the elements numbered 1 to 5 are drawn.
- selec = c("name1","name5") then the elements named name1 and name5 are drawn.
- selec = "contrib 10" then the 10 active or illustrative elements that have the highest contribution on the 2 dimensions of the plane are drawn.
- selec = "contrib" then the optimal number of active or illustrative elements that have the highest contribution on the 2 dimensions of the plane are drawn.
- selec = "cos2 5" then the 5 active or illustrative elements that have the highest cos2 on the 2 dimensions of the plane are drawn.
- selec = "cos2 0.8" then the active or illustrative elements that have a cos2 higher to 0.8 on the plane are drawn.
- selec = "cos2" then the optimal number of active or illustrative elements that have the highest cos2 on the 2 dimensions of the plane are drawn.

The coef argument is used in order to adjust the selection of the elements when based on selec = "contrib" or selec = "cos2". For example :
- if coef = 2, the threshold is 2 times higher, and thus 2 times more restrictive.
- if coef = 0.5, the threshold is 2 times lower, and thus 2 times less restrictive.

Value

drawn	the elements selected.
what.drawn	the criterion of selection (as a sentence).

Author(s)

Simon Thuleau and Francois Husson

See Also

description

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
selection(res.pca, margin = 1, selec = "contrib 10")

## End(Not run)
```

whichFacto *Analysis class*

Description

Return the class of the factorial object (ie. the kind of analysis performed)

Usage

```
whichFacto(res)
```

Arguments

res	an object of class PCA, CA or MCA.

Author(s)

Simon Thuleau and Francois Husson

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
whichFacto(res.pca)

## End(Not run)
```

writeRmd *Write Rmarkdown file*

Description

Writes text or dumps a variable in a Rmarkdown file, and declares the utilisation and the configuration of a chunk.

Usage

```
writeRmd(..., file = "", append = TRUE, sep = " ", end = "\n", dump = FALSE,
         start = FALSE, stop = FALSE, options = NULL)
```

Arguments

...	some R objects or other arguments to pass to the cat function.
file	the file path where to write the description in Rmarkdown langage. If not specified, the description is written in the console.
append	a boolean, if TRUE the text is written at the end of the file. Else it is overwritten.
sep	a character chain to insert between each element written in the file (by default a blank space).
end	a character chain to add at the end of the text written in the file (by default a line break).
dump	a boolean : if TRUE, the text send to the function is interpreted as a variable name. A dump as to be written in a chunck declaration.
start	a boolean : if TRUE, the text written is preceded by a beginning chunk declaration.
stop	a boolean : if TRUE, the text written is preceded by a ending chunk declaration.
options	a character chain listing the options to declare for a chunk declaration.

Details

To learn about all the possible chunck options, see https://yihui.org/knitr/options. Anyway, to declare a R langage chunk, write at least "r" as option.

Author(s)

Simon Thuleau and Francois Husson

See Also

createRmd, readRmd

Examples

```
## Not run:
require(FactoMineR)
data(decathlon)
res.pca = PCA(decathlon, quanti.sup = c(11:12), quali.sup = c(13), graph = FALSE)
create.rmd(res.pca, file = "PCA.Rmd", document = "pdf_document")

drawn = selection(res.pca)$drawn

writeRmd(start = TRUE, options = "r, echo = FALSE, fig.align = 'center', fig.height = 3.5,
         fig.width = 5.5", file = "PCA.Rmd", end = "")
writeRmd("drawn", file = file, dump = TRUE)
writeRmd("plot.PCA(res, select = drawn, choix = 'ind', invisible = 'quali', title = '')",
         stop = TRUE, file = "PCA.Rmd")

writeRmd("**", figure.title, " - ", "Individuals factor map (PCA)", "**", file = "PCA.Rmd",
         sep = "")

## End(Not run)
```

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