Package ‘FactoClass’

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Bogota

Localities by Stratums in Bogota City

Description
Contingency Table that indicates the number of blocks of Bogota, in localities by strataums (DAPD 1997, p.77).

Usage
data(Bogota)

Format
Object whit class data.frame of 19 rows and 7 columns.

Source
DAPD (1997), Population, stratification and socioeconomic aspects of Bogota

References

BreedsDogs

Breeds of Dog

Description
Table that describes 27 breeds of dog considering their size, weight, speed, intelligence, affectivity, aggressiveness and function.

Usage
data(BreedsDogs)
Format

Object of class data.frame with 27 rows and 7 columns with the following description:

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (SIZE)</td>
<td>Small (sma)</td>
</tr>
<tr>
<td>Weight (WEIG)</td>
<td>lightweight (lig)</td>
</tr>
<tr>
<td>Speed (SPEE)</td>
<td>Low (low)</td>
</tr>
<tr>
<td>Intelligence (INTE)</td>
<td>Low (low)</td>
</tr>
<tr>
<td>Affectivity (AFFE)</td>
<td>Low (low)</td>
</tr>
<tr>
<td>aggressiveness (AGGR)</td>
<td>Low (low)</td>
</tr>
<tr>
<td>function (FUNC)</td>
<td>Company (com)</td>
</tr>
</tbody>
</table>

Source

Fine, J. (1996), 'Iniciacion a los analisis de datos multidimensionales a partir de ejemplos', Notas de clase, Montevideo.

References

Brefort, A. (1982), 'Letude des races canines a partir de leurs caracteristiques qualitatives', HEC - Jouy en Josas

Description

It evaluates the centroids of a partition with the weights in \( rw \)

Usage

\[
\text{centroids}(\text{df, cl, rw}=\text{rep}(1/\text{nrow(df)}, \text{nrow(df)}))
\]

Arguments

- **df**: object of class data.frame, with the data of variables or coordinates
- **cl**: vector indicating the cluster of each element
- **rw**: weight of the rows of df, by default the same

Value

Object of class list with the following:

- **centroids**: class centroids
- **weights**: class weights
cluster.carac

Author(s)

Campo Elias Pardo <cepardot@unal.edu.co>

Examples

```r
data(iris)
centroids(iris[, -5], iris[, 5])
```

Description

It makes the characterization of the classes or cluster considering the variables in tabla. These variables can be quantitative, qualitative or frequencies.

Usage

```r
cluster.carac( tabla, clase, tipo.v="d", v.lim = 2 )
```

Arguments

- `tabla`: object data.frame with variables of characterization, the variables must be of a single type (quantitative, qualitative or frequencies)
- `clase`: vector that determines the partition of the table
- `tipo.v`: type of variables: quantitative("continuas"), qualitative ("nominales") or frequencies("frecuencia")
- `v.lim`: test value to show the variable or category like characteristic.

Details

For nominal or frequency variables it compares the percentage of the categories within each class with the global percentage. For continuous variables it compares the average within each class with the general average. Categories and variables are ordered within each class by the test values and it shows only those that pass the threshold v.lim.

Value

Object of class list. It has the characterization of each class or cluster.

Author(s)

Pedro Cesar del Campo <pcdelcampon@unal.edu.co>, Campo Elias Pardo <cepardot@unal.edu.co>, Mauricio Sadinle <msadinleg@unal.edu.co>
References


Examples

data(BreedsDogs)
BD.act <- BreedsDogs[-7] # active variables
BD.function <- subset(BreedsDogs,select=7)
carac(BD.act,BD.function,"ca",2.0) # nominal variables

data(iris)
iris.act <- Fac.Num(iris)$numeric
clas <- Fac.Num(iris)$factor
carac(iris.act,clase,"co",2.0) # continuous variables

# frequency variables
data(BreedsDogs)
attach(BreedsDogs)
weig<-table(FUNc,WEIG)
weig<-data.frame(weig[,1],weig[,2],weig[,3])
carac(weig, row.names(weig), "fr", 2) # frequency variables
detach(BreedsDogs)

ColorAdjective

 Associations between colors and adjectives.

Description

A group of students from Nanterre University (Paris X) were presented with a list of eleven colours: blue, yellow, red, white, pink, brown, purple, grey, black, green and orange. Each person in the group was asked to describe each color with one or more adjectives. A final list of 89 adjectives were associates with eleven colors.

Usage

data(ColorAdjective)

Format

Object of class data.frame with 89 rows and 11 columns.

Source

References

Fine, J. (1996), *Iniciacion a los analisis de datos multidimensionales a partir de ejemplos*, Notas de curso, Montevideo

---

**LaTeX Tables of Coordinates and Aids to Interpretation of Principal Axis Methods**

Description

Coordinates and aids of interpretation are wrote in tabular environment of LaTeX inside a Table

Usage

```latex
dudi.tex(dudi, job="", aidsC=TRUE, aidsR=TRUE, append=TRUE)
latex(obj, job="latex", tit="", lab="", append=TRUE, dec=1)
```

Arguments

- `dudi`: an object of class `dudi`
- `job`: a name to identify files and outputs
- `aidsC`: if it is TRUE the coordinates and aids of interpretation of the columns are printed
- `aidsR`: if it is TRUE the coordinates and aids of interpretation of the rows are printed
- `append`: if it is TRUE LaTeX outputs are appended on the file
- `obj`: object to export to LaTeX
- `tit`: title of the table
- `lab`: label for crossed references of LaTeX table
- `dec`: number of decimal digits

Details

LaTeX function is used to build up a table. The aids of interpretation are obtained with `inertia.dudi` of ade4. A file is wrote in the work directory (job.txt) with the following tables:

- `tvalp` eigenvalues
- `cl` eigenvectors
- `co` column coordinates
- `col.abs` column contributions in percentage
- `col.cum` accumulated quality of the representation of columns in percentage/100
- `li` row coordinates
- `row.abs` row contributions in percent
- `row.rel` quality of the representation of rows in percentage
- `row.cum` accumulated quality of the representation of rows in percentage/100
Fac.Num

Author(s)
Campo Elías PARDO <cepardot@unal.edu.co>

Examples
data(ardeche)
coa1 <- dudi.coa(ardeche$tab, scann = FALSE, nf = 4)
dudi.tex(coa1, job="Ardeche")

Description
An object of class data.frame is divided into a list with two tables, one with quantitative variables and the other with qualitative variables.

Usage
Fac.Num(tabla)

Arguments
tabla object of class 'data.frame'

Value
It returns one list with one or two objects of class data.frame with the following characteristics:

factor table with the qualitative variables
numeric table with the quantitative variables

Author(s)
Pedro Cesar Del Campo <pcdelcampon@unal.edu.co>

Examples
data(BreedsDogs)
Fac.Num(BreedsDogs)

data(iris)
Fac.Num(iris)
FactoClass  

Combination of Factorial Methods and Cluster Analysis

Description

Performs the factorial analysis of the data and a cluster analysis using the nfcl first factorial coordinates.

Usage

FactoClass( dfact, metodo, dfilu = NULL, nf = 2, nfcl = 10, k.clust = 3, scanFC = TRUE, n.max = 5000, n.clus = 1000, sign = 2.0, conso=TRUE, n.indi = 25, row.w = rep(1, nrow(dfact)) )

## S3 method for class 'FactoClass'
print(x, ...)
analisis.clus(X,W)

Arguments

dfact  
object of class data.frame, with the data of active variables.

metodo  
function of ade4 for ade4 factorial analysis, dudi.pca, Principal Component Analysis; dudi.coa, Correspondence Analysis; witwit.coa, Internal Correspondence Analysis; dudi.acm, Multiple Correspondence Analysis ...

dfilu  
ilustrative variables (default NULL)

nf  
number of axes to use into the factorial analysis (default 2)

nfcl  
number of axes to use in the classification (default 10)

k.clust  
number of classes to work (default 3)

scanFC  
if is TRUE, it asks in the console the values nf, nfcl y k.clust

n.max  
when rowname(dfact)>n.max, k-means is performed previous to hierarchical clustering (default 5000)

n.clus  
when rowname(facti)>n.max, the previous k-means is performed with n.clus groups (default 1000)

sign  
threshold test value to show the characteristic variables and modalities

conso  
when conso is TRUE, the process of consolidating the classification is performed (default TRUE)

n.indi  
number of indices to draw in the histogram (default 25)

row.w  
vector containing the row weights if metodo<>dudi.coa

x  
object of class FactoClass

...  
further arguments passed to or from other methods

X  
coordinates of the elements of a class

W  
weights of the elements of a class
Details

Lebart et al. (1995) present a strategy to analyze a data table using multivariate methods, consisting of an initial factorial analysis according to the nature of the compiled data, followed by the performance of mixed clustering. The mixed clustering combines hierarchic clustering using the Ward’s method with K-means clustering. Finally a partition of the data set and the characterization of each one of the classes is obtained, according to the active and illustrative variables, being quantitative, qualitative or frequency.

FactoClass is a function that connects procedures of the package ade4 to perform the analysis factorial of the data and from stats for the cluster analysis.

The function analisis.clus calculates the geometric characteristics of each class: size, inertia, weight and square distance to the origin.

For impression in LaTeX format see FactoClass.tex.

To draw factorial planes with cluster see plotFactoClass.

Value

object of class FactoClass with the following:

- **dudi**: object of class dudi from ade4 with the specifications of the factorial analysis
- **nfcl**: number of axes selected for the classification
- **k**: number of classes
- **indices**: table of indices obtained through WARD method
- **cor.clus**: coordinates of the clusters
- **clus.summ**: summary of the clusters
- **cluster**: vector indicating the cluster of each element
- **carac.cate**: cluster characterization by qualitative variables
- **carac.cont**: cluster characterization by quantitative variables
- **carac.frec**: cluster characterization by frequency active variables

Author(s)

Pedro Cesar del Campo <pcdelcampon@unal.edu.co>, Campo Elias Pardo <cepardot@unal.edu.co> http://www.docentes.unal.edu.co/cepardot, Ivan Diaz <ildiazm@unal.edu.co>, Mauricio Sadinle <msadinleg@unal.edu.co>

References

Examples

```r
# Cluster analysis with Correspondence Analysis
data(ColorAdjective)
FC.col <- FactoClass(ColorAdjective, dudi.coa)
6
table
FC.col
FC.col$dudi

# Cluster analysis with Multiple Correspondence Analysis
data(BreedsDogs)
BD.act <- BreedsDogs[-7]  # active variables
BD.ilu <- BreedsDogs[7]   # ilustrative variables

FC.bd <- FactoClass(BD.act, dudi.acm, k.clust = 4,
                     scanFC = FALSE, dfilu = BD.ilu, nfcl = 10)

FC.bd
FC.bd$clus.summ
FC.bd$indices
```

FactoClass.tex

Table of Coordinates, Aids of Interpretation of the Principal Axes and Cluster Analysis in LaTeX format.

Description

The coordinates, aids of interpretation and results of cluster analysis of an object of class `FactoClass` are written in tables for edition in LaTeX format and written in a file.

Usage

```r
FactoClass.tex(FC, job="", append=TRUE, dir = getwd(), p.clust = FALSE )
```

## S3 method for class 'FactoClass.tex'
print(x, ...) 
latexDF(obj, job="latex",tit="",lab="",append=TRUE,dec=1,
        dir = getwd(), to.print = TRUE )

roundDF(tabla,dec=1)
```
Arguments

FC          object of class FactoClass.
job         A name to identify the exit.
append      if is 'TRUE' the exit in LaTeX format is added to the file.
dir         name of the directory in which the file is kept.
p.clust     the value of this parameter is 'TRUE' or 'FALSE' to print or not the cluster of each element.
tabla       object of class 'data frame'.
dec         number of decimal.
x           object of class FactoClass
...         further arguments passed to or from other methods
obj         object of class data.frame.
tit         title of the table in LaTeX format.
lab          label of the table in LaTeX format.
to.print     if it is 'TRUE' the table is also printed in the console.

Details

This function helps with the construction of tables in LaTeX format. Besides, it allows an easy reading of the generated results by FactoClass. The function latexDF is an entrance to xtable and turns an object of class data.frame a table in LaTeX format.

Value

object of class FactoClass.tex with the following characteristics:
tvalp        eigenvalues * 1000.
c1           eigenvectors.
co           coordinates of the columns.
col.abs      contribution of each column to the inertia of the axis (percentage).
col.rel      quality of representation of each column (percentage).
col.cum      quality of representation of each column accumulated in the subspace (percentage).
li           coordinates of the rows.
row.abs      contribution of each rows to the inertia of the axis (percentage).
row.rel      quality of representation of each rows (percentage).
row.cum      quality of representation of each rows accumulated in the subspace (percentage).
indices      table of indices of level generated by the Ward cluster analysis.
cor.clus     coordinates of the center of gravity of each cluster.
clus.summ    summary of the cluster.
carac.cate   cluster characterization by qualitative variables.
carac.cont   cluster characterization by quantitative variables.
cluster      vector indicating the cluster of each element.
**Author(s)**

Pedro Cesar del Campo <pcdelcampon@unal.edu.co>, Campo Elias Pardo <cepardot@unal.edu.co>

**Examples**

data(BreedsDogs)
BD.act <- BreedsDogs[-7]  # active variables
BD.ilu <- BreedsDogs[7]   # illustrative variables
# MCA
FaCl <- FactoClass( BD.act, dudi.acm,
    scanFC = FALSE, dfilu = BD.ilu, nfcl = 10, k.clust = 4 )
FactoClass.tex(FaCl, job="BreedsDogs!", append=TRUE)
FactoClass.tex(FaCl, job="BreedsDogs", append=TRUE, p.clust = TRUE)

---

**kmeansW**

*K-means with Weights of the Elements*

**Description**

It is a modification of kmeans Hartigan-Wong algorithm to consider the weight of the elements to classify.

**Usage**

```
kmeansW(x, centers, weight = rep(1,nrow(x)),
    iter.max = 10, nstart = 1)
```

**Arguments**

- `x`: A numeric vector, matrix or data frame.
- `centers`: Either the number of clusters or a set of initial (distinct) cluster centres. If a number, a random set of (distinct) rows in `x` is chosen as the initial centres.
- `weight`: weight of the elements of `x`. by default the same.
- `iter.max`: The maximum number of iterations allowed.
- `nstart`: If centers is a number, how many random sets should be chosen?

**Details**

With the 'Hartigan-Wong' algorithm, this function performs the *K-means* clustering diminishing inertia intra classes. In this version the Fortran code kmnsW.f was changed by C++ code kmeanw.cc programed by Camilo Jose Torres, modifing C code programed by Burkardt.

**Value**

object of class `FactoClass` with the following characteristics:

- `cluster`: vector indicating the cluster of each element.
  ...

"
Author(s)
Camilo José Torres <cjtorresj@unal.edu.co>, Campo Elias Pardo <cepardot@unal.edu.co>

References

Examples
```r
data(Bogota)
ac.bog <- Bogota[-1]
il.bog <- Bogota[ 1]
acs <- dudi.coa( ac.bog, nf=6, scannf = FALSE )
kmeansW( acs$li, 7, acs$lw )
```

---

**list.to.data**  
*list to data.frame*

Description
Modification of an object of class `list` into an object of class `data.frame`.

Usage
```r
list.to.data(lista,nvar="clasif")
```

Arguments
- `lista` list that contains several `data.frame` of the same structure.
- `nvar` (Optional) Name of the new variable that considers the partition given by the elements of the list.

Details
This function turns an object of class `list` into an object of class `data.frame`, this function is used internally to create objects of class `data.frame` to make tables in *LaTeX* format.

Value
Object of class `data.frame`.
Author(s)

Pedro Cesar Del Campo <pcdelcampon@unal.edu.co>

Examples

```r
A <- data.frame(r1=rnorm(5),r2=rnorm(5))
B <- data.frame(r1=rnorm(15),r2=rnorm(15))

LL <- list(A=A,B=B)
LL
list.to.data(LL)
```

---

**plot.dudi**  
*Factorial Planes from Objects of Class dudi*

Description

It plots factorial planes from objects of class dudi

Usage

```r
## S3 method for class 'dudi'
plot(x,ex=1,ey=2,xlim=NULL,ylim=NULL,main=NULL,rotx=FALSE,roty=FALSE,
roweti=row.names(dudi$li),coleti=row.names(dudi$co),
axislabel=TRUE,col.row="black",col.col="blue",cex=0.8,
  cex.row=0.8,cex.col=0.8,all.point=TRUE,Trow=TRUE,Tcol=TRUE,
cframe=1.2,uca1=0,cex.global=1,infaxes="out",...)
sutil.grid(cgrid,scale=TRUE)
```

Arguments

- `x`  
  object of type dudi
- `ex`  
  number indentifying the factor to be used as horizontal axis. Default 1
- `ey`  
  number indentifying the factor to be used as vertical axis. Default 2
- `xlim`  
  the x limits (x1, x2) of the plot
- `ylim`  
  the y limits of the plot
- `main`  
  graphic title
- `rotx`  
  TRUE if you want change the sign of the horizontal coordinates. Default FALSE
- `roty`  
  TRUE if you want change the sign of the vertical coordinates. Default FALSE
- `roweti`  
  selected row points for the graphic. Default all points
- `coleti`  
  selected column points for the graphic. Default all points
axislabel if it is TRUE the axis information is written
col.row color for row points and row labels. Default "black"
col.col color for column points and column labels. Default "blue"
cex global scale for the labels. Default cex=0.8
cex.row scale for row points and row labels. Default cex.row=0.8
cex.col scale for column points and column labels. Default cex.col=0.8
all.point If if is TRUE, all points are outlined. Default all.point=TRUE
Trow if it is TRUE the row points are outlined. Default TRUE
Tcol if it is TRUE the column points are outlined. Default TRUE
cframe scale for graphic limits
ucal quality representation threshold (percentage) in the plane. Default ucal=0
cex.global scale for the label sizes
infaxes place to put the axes information: "out"","in","no". Default infaxes="out". If infaxes="out" the graphic is similar to FactoMineR graphics, otherwise the style is similar to the one in ade4, without axes information when infaxes="no"
... further arguments passed to or from other methods
cgrid internal parameter
scale internal

Details

Plot the selected factorial plane. sutil.grid is used by plot.dudi

Value

It graphs the factorial plane x,y using $co, $li of a "dudi" object. If ucal > 0, the function inertia.dudi is used to calculate the quality of representation on the plane

Author(s)

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Examples

data(ardeche)
ca <- dudi.coa(ardeche$tab, scannf=FALSE, nf=4)
# FactoMineR style
plot.dudi(ca, ucal=40, all.point=FALSE, main="SCA of Ardeche, First Factorial Plane")
dev.new()
# ade4 style
plot.dudi(ca, ex=3, ey=4, ucal=20, all.point=FALSE, infaxes="in", main="SCA of Ardeche, Plane 3-4")
plotct  

Row and Column Profiles of a Contingency Table

Description

It plots barplot profiles of rows or columns from a contingency table including marginal profiles.

Usage

plotct(x, profiles="both", legend.text=TRUE, ...)

Arguments

- `x`: contingency table
- `profiles`: select profiles: "both" file and column profiles in two graph devices, "row" only row profiles, "col" only column profiles
- `legend.text`: if it is TRUE a box with legends is included at the right
- `...`: further arguments passed to or from other methods

Details

Plot row profiles in horizontal form and columns profiles in vertical form.

Author(s)

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http://www.docentes.unal.edu.co/cepardot

Examples

mycolors<-colors()[c(1,26,32,37,52,57,68,73,74,81,82,84,88,100)]
data(Bogota)
plotct(Bogota[,2:7],col=mycolors)

plotFactoClass  

Factorial Planes Showing the Classes

Description

For objects of class FactoClass it graphs a factorial plane showing the center of gravity of the cluster, and identifying with colors the cluster to which each element belongs.
plotFactoClass

Usage

plotFactoClass(fc=x1, y=x2, xlim=NULL, ylim=NULL, rotx=FALSE, roty=FALSE,
roweti=row.names(dudi$l1), coleti=row.names(dudi$c0),
titre=NULL, axislabel=TRUE, col.row=1:FC$k,
col.col="blue", cex=0.8, cex.row=0.8, cex.col=0.8,
all.point=TRUE, Trow=TRUE, Tcol=TRUE, cframe=1.2, ucal=0,
cex.global=1, infaxes="out",
nclus=paste("c1", 1:FC$k, sep=""),
cex.clu=cex.row, cstar=1 )

Arguments

FC
object of class FactoClass.
x
number indentifying the factor to be used as horizontal axis. Default x=1
y
number indentifying the factor to be used as vertical axis. Default y=2
xlim
the x limits (x1, x2) of the plot
ylim
the y limits of the plot
rotx
TRUE if you want to change the sign of the horizontal coordinates (default FALSE).
roty
TRUE if you want to change the sign of the vertical coordinates (default FALSE).
roweti
selected row points for the graphic. Default all points.
coleti
selected column points for the graphic. Default all points.
titre
graphics title.
axislabel
if it is TRUE the axis information is written.
col.row
color for row points and row labels. Default 1:FC$k.
col.col
color for column points and column labels. Default "grey55".
cex
global scale for the labels. Default cex=0.8.
cex.row
scale for row points and row labels. Default cex.row=0.8.
cex.col
scale for column points and column labels. Default cex.col=0.8.
cex.clu
scale for cluster points and cluster labels. (default cex.row).
all.point
if if is TRUE, all points are outlined. Default all.point=TRUE.
Trow
if it is TRUE the row points are outlined. Default TRUE.
Tcol
if it is TRUE the column points are outlined. Default TRUE.
nclus
labels for the clusters (default cl1, cl2, ...)
cframe
scale for graphics limits
ucal
quality Representation Threshold in the plane. Default ucal=0
cex.global
scale for the label sizes
infaxes
place to put the axes information: "out", "in", "no". Default infaxes="out". If infaxes="out" the graphic is similar to FactoMineR graphics, otherwise the style is similar to the one in ade4, without axes information when infaxes="no"
cstar
length of the rays between the centroids of the classes and their points
plotfp

Factorial Planes from Coordinates

Description

It plots factorial planes from a coordinate table

Usage

plotfp(co, x=1, y=2, eig=NULL, cal=NULL, ucal=0, xlim=NULL, ylim=NULL, main=NULL, rotx=FALSE, roty=FALSE, eti=row.names(co),
axislabel=TRUE, col.row="black", cex=0.8, cex.row=0.8,
all.point=TRUE, cframe=1.2, cex.global=1, infaxes="out", asp=1)

Arguments

c0 matrix or data.frame with coordinates
x the component like horizontal axis
y the component like vertical axis
eig numeric with the eigenvalues
plotfp

- **cal**: matrix or data.frame with the square cosinus
- **ucal**: quality representation threshold (percentage) in the plane. Default ucal=0
- **xlim**: the x limits (x1, x2) of the plot
- **ylim**: the y limits of the plot
- **main**: graphic title
- **rotx**: TRUE if you want change the sign of the horizontal coordinates. Default FALSE
- **roty**: TRUE if you want change the sign of the vertical coordinates. Default FALSE
- **eti**: selected row points for the graphic. Default all points
- **axislabel**: if it is TRUE the axis information is written
- **col.row**: color for row points and row labels. Default "black"
- **cex**: global scale for the labels. Default cex=0.8
- **cex.row**: scale for row points and row labels. Default cex.row=0.8
- **all.point**: If it is TRUE, all points are outlined. Default all.point=TRUE
- **cframe**: scale for graphic limits
- **cex.global**: scale for the label sizes
- **infaxes**: place to put the axes information: "out", "in", "no". Default infaxes="out". If infaxes="out" the graphic is similar to FactoMineR graphics, otherwise the style is similar to the one in ade4, without axes information when infaxes="no"
- **asp**: the y/x aspect ratio

**Details**

Plot the selected factorial plane.

**Value**

It graphs the factorial plane x,y using co and optional information of eigenvalues and representation quality of the points. If ucal > 0, only the points with the quality of representation on the plane bigger than ucal are pointed

**Author(s)**

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**Examples**

data(Bogota)
cal <- dudi.coa(Bogota[,2:7],scannf=FALSE,nf=2)
plotfp(cal$li,eig=cal$eig,main="First Factorial Plane")
stableclus

Stable clusters for cluster analysis

Description

Performs Stable Cluster Algorithm for cluster analysis, using factorial coordinates from a dudi object

Usage

stableclus(dudi, part, k.clust, ff.clus=NULL, bplot=TRUE, kmns=FALSE)

Arguments

dudi A dudi object, result of a previous factorial analysis using ade4 or FactoClass
part Number of partitions
k.clust Number of clusters in each partition
ff.clus Number of clusters for the final output, if NULL it asks in the console (Default NULL)
bplot if TRUE, prints frequencies barplot of each cluster in the product partition (Default TRUE)
kmns if TRUE, the process of consolidating the classification is performed (Default FALSE)

Details

Diday (1972) (cited by Lebart et al. (2006)) presented a method for cluster analysis in an attempt to solve one of the inconvenients with the kmeans algorithm, which is convergence to local optims. Stable clusters are built by performing different partitions (using kmeans algorithm), each one with different initial points. The groups are then formed by selecting the individuals belonging to the same cluster in every partition.

Value

object of class stableclus with the following characteristics:

cluster vector indicating the cluster of each element.

Author(s)

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References


Examples

data(ColorAdjective)
FCCol <- FactoClass(ColorAdjective, dudi.coa,nf=6,nfcl=10,k.clust=7,scanFC = FALSE)
acs <- FCCol$dudi
stableclus(acd,3,3,4,TRUE,TRUE)

<table>
<thead>
<tr>
<th>Vietnam</th>
<th>Student opinions about the Vietnam War</th>
</tr>
</thead>
</table>

Description

The newspaper of the students of the University of Chapel Hill (North Carolina) conducted a survey of student opinions about the Vietnam War in May 1967. Responses were classified by sex, year in the program and one of four opinions:

A defeat power of North Vietnam by widespread bombing and land invasion
B follow the present policy
C withdraw troops to strong points and open negotiations on elections involving the Viet Cong
D immediate withdrawal of all U.S. troops

Usage

data(Vietnam)

Format

The 3147 consulted students were classified considering the sex, year of study and chosen strategy, originating a contingency table of 10 rows: M1 to M5 and F1 to F5 (the years of education are from 1 to 5 and sexes are male (M) and female (F)) and 4 columns A, B, C and D.
ward.cluster

Hierarchic Classification by Ward’s Method

Description

Performs the classification by Ward’s method from the matrix of Euclidean distances.

Usage

ward.cluster(dista, peso = NULL, plots = TRUE, h.clust = 2, n.indi = 25 )

Arguments

dista matrix of Euclidean distances (class(dista)=="dist").
peso (Optional) weight of the individuals, by default equal weights
plots it makes dendrogram and histogram of the Ward’s method
h.clust if it is ’0’ returns a object of class hclust and a table of level indices, if it is ’1’ returns a object of class hclust, if it is ’2’ returns a table of level indices.
n.indi number of indices to draw in the histogram (default 25).

Details

It is an entrance to the function h.clus to obtain the results of the procedure presented in Lebart et al. (1995). Initially the matrix of distances of Ward of the elements to classify is calculated:

The Ward’s distance between two elements to classify $i$ and $l$ is given by:

$$W(i,l) = (m_i * m_l) / (m_i + m_l) * dist(i,l)^2$$

where $m_i$ and $m_l$ are the weights and $dist(i,l)$ is the Euclidean distance between them.

Value

It returns an object of class hclust and a table of level indices (depending of h.clust). If plots = TRUE it draws the indices of level and the dendrogram.
Author(s)

Pedro Cesar del Campo <pcdelcampon@unal.edu.co>, Campo Elias Pardo <cepardot@unal.edu.co>
http://www.docentes.unal.edu.co/cepardot

References


Examples

data(ardeche)
ca <- dudi.coa(ardeche$tab, scannf=FALSE, nf=4)

ward.cluster( dist= dist(ca$li), peso=ca$lw )

dev.new()
HW <- ward.cluster( dist= dist(ca$li), peso=ca$lw, h.clust = 1)
plot(HW)
rect.hclust(HW, k=4, border="red")
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