Package ‘MBAnalysis’

September 20, 2021

Title Multiblock Exploratory and Predictive Data Analysis
Version 0.1.0
Date 2021-09-18


Imports ggplot2, ggrepel
License GPL-3
Encoding UTF-8
LazyData true
RoxygenNote 7.1.1
NeedsCompilation no

Author Essomanda Tchandao Mangamana [aut, cre], Véronique Cariou [aut], Evelyne Vigneau [aut]
Maintainer Essomanda Tchandao Mangamana <tchaneso@yahoo.fr>
Repository CRAN
Date/Publication 2021-09-20 09:30:06 UTC

R topics documented:

- ComDim ................................................................. 2
- ham ................................................................. 4
- MBPCA ............................................................. 5
- MBPLS ............................................................. 7
- MBWCov ......................................................... 9
- plot.ComDim .................................................. 12
ComDim

Common Dimensions analysis (ComDim)

Description

ComDim applied to a set of quantitative blocks of variables.

Usage

ComDim(
    X,
    group,
    algo = "eigen",
    ncompprint = NULL,
    scale = "none",
    option = "uniform",
    nstart = 10,
    threshold = 1e-08,
    plotgraph = TRUE,
    axes = c(1, 2)
)

Arguments

x Block obtained by horizontally merging all the blocks of variables.
group Vector indicating the number of variables per block.
algo Type of algorithm to use. Either "eigen" (default) or "nipals".
ncompprint Number of global components to print. By default (NULL), all the global components of the analysis are printed.
scale Type of standardization applied to the variables. Either "none" (default) or "sd". If scale="sd", each variable is divided by its standard deviation.
option  Type of normalization applied to each block of variables (either "none" or "uniform"). If option="uniform" (default), each block of variables is divided by its Frobenius norm.

nstart  Number of random initializations of the global component in case of nipals algorithm (by default 10).

threshold  Value used to break the iterative loop (by default 1e-8).

plotgraph  Boolean (TRUE/FALSE). If TRUE (default), graphs depicting saliences, scores of individuals, correlations of variables with the global components and contributions of blocks of variables to the determination of global components are displayed.

axes  Vector of length two which specifies the global components to plot (by default the first two).

Value

Returns a list of the following elements:

components : Numeric vector of length two that indicates the number of global components of the analysis and the number of global components to print.

optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.

cumexplained : Two columns matrix of percentages of total inertia of the blocks of variables explained by the successive global components and their cumulative values.

explained.X : Matrix of percentages of inertia explained for each Xb block.

saliences : Matrix containing the specific weights of different blocks of variables on global components.

contrib : Matrix of contribution of each Xb block to the determination of global components.

T : Matrix of global components (scores of individuals).

C : Compromise matrix (unnormed global components).

globalcor : Matrix of correlation coefficients between the original variables and the global components.

cor.g.b : Array that gives the correlation of the global components with their respective block components.

Block  : Results associated with each block of variables.

• T.b : Array that contains the matrices of block components.

• blockcor : List of matrices of correlation coefficients between the original variables of each block and the block components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.
References


See Also

print.ComDim plot.ComDim summary.ComDim

Examples

data(ham)
X=ham$X
group=ham$group
res.comdim <- ComDim(X, group)
res.comdim

---

ham

Ham data

Description

Case study pertaining to the sensory evaluation of eight American dry-cured ham products, performed by a panel of trained assessors.

Usage

data(ham)

Format

An object of class "list" with 8 products, 3 blocks of X variables (Flavor, Aroma, Texture) and 1 block of Y variables corresponding to hedonic measures:

X dataframe of 8 products and 25 variables structured into 3 blocks: Flavor (11 variables), Aroma (8 variables) and Texture (6 variables)

Y dataframe of 8 products and 6 vectors of hedonic values corresponding to consumers' segmentation

group vector indicating the number of variables per block

References

Examples

data(ham)
ham$X
ham$Y
ham$group

Description

Performs MB-PCA on a set of quantitative blocks of variables.

Usage

MBPCA(
  X,
  group,
  algo = "eigen",
  ncompprint = NULL,
  scale = "none",
  option = "uniform",
  nstart = 10,
  threshold = 1e-08,
  plotgraph = TRUE,
  axes = c(1, 2)
)

Arguments

x Block obtained by horizontally merging all the blocks of variables.
group Vector which indicates the number of variables in each block.
algo Type of algorithm to use. Either "eigen" (default) or "nipals".
ncompprint Number of global components to print. By default (NULL), all the global components of the analysis are printed.
scale Type of standardization applied to the variables. Either "none" (default) or "sd". If scale="sd", each variable is divided by its standard deviation.
option Type of normalization applied to each block of variables (either "none" or "uniform"). If option="uniform" (default), each block of variables is divided by its Frobenius norm.
nstart Number of random initializations of the global component in case of nipals algorithm (by default 10).
threshold Value used to break the iterative loop (by default 1e-8).
plotgraph  Boolean (TRUE/FALSE). If TRUE (default), graphs depicting scores of individuals, correlations of variables with the global components and contributions of blocks of variables to the determination of global components are displayed.

axes  Vector of length two which specifies the global components to plot (by default the first two).

Value

Returns a list of the following elements:

components : Numeric vector of length two that indicates the number of global components of the analysis and the number of global components to print.

optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.

cumexplained : Two columns matrix of percentages of total inertia of the blocks of variables explained by the successive global components and their cumulative values.

explained.X : Matrix of percentages of inertia explained in each Xb block.

contrib : Matrix of contribution of each Xb block to the determination of global components.

T : Matrix of global components (scores of individuals).

C : Compromise matrix (unnormed global components).

globalcor : Matrix of correlation coefficients between variables and global components.

cor.g.b : Array that gives the correlation of the global components with their respective block components.

Block  : Results associated with each block Xb.

• T.b : Array that contains the matrices of block components.

• blockcor : List of matrices of correlation coefficients between the original variables of each block and the block components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve- lyne VIGNEAU.

References


**MBPLS**

Multiblock Partial Least Squares (MB-PLS) regression

**Description**

MB-PLS regression applied to a set of quantitative blocks of variables.

**Usage**

```r
MBPLS(
  X, 
  Y, 
  group, 
  algo = "eigen", 
  ncompprint = NULL, 
  scale = "none", 
  scaleY = "none", 
  option = "uniform", 
  optionY = "uniform", 
  nstart = 10, 
  threshold = 1e-08, 
  plotgraph = TRUE, 
  axes = c(1, 2) 
)
```

**Arguments**

- **X** Block obtained by horizontally merging all the explanatory blocks of variables.
- **Y** Response block of variables.
- **group** Vector indicating the number of variables in each explanatory block.
- **algo** Type of algorithm to use. Either "eigen" (default) or "nipals".
- **ncompprint** Number of global components to print. By default (NULL), all the global components of the analysis are printed.

**Examples**

```r
data(ham)
X=ham$X
group=ham$group
res.mbpca <- MBPCA(X, group)
res.mbpca
```
scale Type of standardization applied to the variables in the explanatory blocks. Either "none" (default) or "sd". If scale="sd", each variable in the explanatory blocks is divided by its standard deviation.

scaleY Type of standardization applied to the variables in the response block. Either "none" (default) or "sd". If scaleY="sd", each variable in the response block is divided by its standard deviation.

option Type of normalization applied to each explanatory block of variables (either "none" or "uniform"). If option="uniform" (default), each explanatory block of variables is divided by its Frobenius norm.

optionY Type of normalization applied to the response block of variables (either "none" or "uniform"). If optionY="uniform" (default), the response block of variables is divided by its Frobenius norm.

nstart Number of random initializations of the vector of Y loadings in case of nipals algorithm (by default 10).

threshold Value used to break the iterative loop (by default 1e-8).

plotgraph Boolean (TRUE/FALSE). If TRUE (default), graphs depicting scores of individuals, correlations of variables with the global components and contributions of blocks of variables to the determination of global components are displayed.

axes Vector that indicates the plane in which graphs should be depicted (by default the plane formed by the first two global components).

Value

Returns a list of the following elements:

components : Numeric vector of length two that gives the number of global components of the analysis and the number of global components to print.

optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.

cumexplained : Four columns matrix of percentages of total inertia of the explanatory blocks, percentages of inertia of the response block explained by the successive global components and their cumulative values.

explained.X : Matrix of percentages of inertia explained for each Xb block.

explained.Y : Matrix of percentages of inertia explained for each Y variable.

contrib : Matrix of contribution of each Xb block to the determination of global components.

T : Matrix of global components (scores of individuals).

C : Compromise matrix (unnormed global components).

U : Matrix of components associated with the response block of variables.

globalcor : Matrix of correlation coefficients between the original variables and the global components.

cor.g.b : Array that gives the correlation of the global components with their respective block components.

betaY : Array of regression coefficients.
Block : Results associated with each block of variables.
   • T.b : Array that contains the matrices of block components.
   • blockcor : List of matrices of correlation coefficients between the original variables of each block of variables and the block components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Evelyne VIGNEAU.

References


See Also

print.MBPLS plot.MBPLS summary.MBPLS

Examples

data(ham)
X=ham$X
group=ham$group
Y=ham$Y
res.mbpls <- MBPLS(X, Y, group)
res.mbpls

MBWCov

Multiblock Weighted Covariate analysis (MB-WCov)

Description

MB-WCov applied to multiblock quantitative variables.

Usage

MBWCov(
    X,
    Y,
    group,
    algo = "eigen",
    ncompprint = NULL,
)
scale = "none",
scaleY = "none",
option = "uniform",
optionY = "uniform",
nstart = 10,
threshold = 1e-08,
plotgraph = TRUE,
axes = c(1, 2)
)

Arguments

X  Block obtained by horizontally merging all the explanatory blocks of variables.
Y  Response block of variables.

group  Vector indicating the number of variables in each explanatory block.
algo  Type of algorithm to use. Either "eigen" (default) or "nipals".
ncompprint  Number of global components to print. By default (NULL), all the global components of the analysis are printed.

scale  Type of standardization applied to the variables in the explanatory blocks. Either "none" (default) or "sd". If scale="sd", each variable in the explanatory blocks is divided by its standard deviation.
scaleY  Type of standardization applied to the variables in the response block. Either "none" (default) or "sd". If scaleY="sd", each variable of the response block is divided by its standard deviation.

option  Type of normalization applied to each explanatory block of variables (either "none" or "uniform"). If option="uniform" (default), each explanatory block of variables is divided by its Frobenius norm.

optionY  Type of normalization applied to the response block of variables (either "none" or "uniform"). If optionY="uniform" (default), the response block of variables is divided by its Frobenius norm.

nstart  Number of random initializations of the vector of Y loadings in case of nipals algorithm (by default 10).
threshold  Value used to break the iterative loop (by default 1e-8).

plotgraph  Boolean (TRUE/FALSE). If TRUE (default), graphs depicting saliences, scores of individuals, correlations of variables with the global components and contributions of blocks of variables to the determination of global components are displayed.

axes  Vector that indicates the plane in which graphs should be depicted (by default the plane formed by the first two global components).

Value

Returns a list of the following elements:
components : Numeric vector of length two that gives the number of global components of the analysis and the number of global components to print.

optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.

cumexplained : Four columns matrix of percentages of total inertia of the explanatory blocks, percentages of inertia of the response block explained by the successive global components and their cumulative values.

explained.X : Matrix of percentages of inertia explained for each Xb block.

explained.Y : Matrix of percentages of inertia explained for each Y variable.

saliences : Matrix containing the specific weights of each explanatory block of variables on global components.

contrib : Matrix of contribution of each Xb block to the determination of global components.

T : Matrix of global components (scores of individuals).

C : Compromise matrix (unnormed global components).

U : Matrix of components associated with the response block of variables.

globalcor : Matrix of correlation coefficients between the original variables and the global components.

cor.g.b : Array that gives the correlation of the global components with their respective block components.

betaY : Array of regression coefficients.

Block : Results associated with each block of variables.

• T.b : Array that contains the matrices of block components.
• blockcor : List of matrices of correlation coefficients between the original variables of each block of variables and the block components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

References


See Also

print.MBWCov plot.MBWCov summary.MBWCov
plot.ComDim

Main Graphs for Common Dimensions analysis (ComDim)

Description

Plot the main graphs for ComDim.

Usage

```r
## S3 method for class 'ComDim'
plot(
x,
axes = c(1, 2),
graphtype = c("saliences", "globalscores", "blockscores", "globalcor", "blockcor", "expl", "cumexpl", "crit", "contrib"),
select = NULL,
max.overlaps = 20,
xlim = NULL,
ylim = NULL,
title = NULL,
color = NULL,
...
)
```

Arguments

- `x` An object of class ComDim.
- `axes` A vector of length two which specifies the global components to plot (by default the first two).
- `graphtype` Type of graph to plot. Either "saliences", "globalscores", "blockscores", "globalcor", "blockcor", "expl", "cumexpl", "crit" or "contrib". Refer to the details section.
- `select` Selection of elements to plot. By default (NULL), all the elements are plotted. Refer to the details section.
- `max.overlaps` Exclude text labels that overlap too many things (by default, 20).
- `xlim` Range for the plotted 'x' values.
- `ylim` Range for the plotted 'y' values.

Examples

```r
data(ham)
X=ham$X
group=ham$group
Y=ham$Y
res.mbwcov <- MBWCov(X, Y, group)
res.mbwcov
```

```r
plot.ComDim
```
plot.ComDim

- **title**: Title of the graph to draw.
- **color**: Color for the plot.
- **...**: Further arguments.

**Details**

The explanation of the arguments `graphtype` and `select` is as follows:

- If `graphtype = "saliences"`, the relationships between blocks of variables are shown.
- If `select = NULL`, all the blocks are shown, otherwise, only the selected ones are shown.
- If `graphtype = "globalscores"`, individuals are projected on the space formed by the global components.
  - In this case, if for example, `select = NULL`, all the individuals are plotted. However, if `select = 5`, only the first five individuals are plotted.
- If `graphtype = "blockscores"`, individuals are projected on the space formed by the block components.
  - If `select = NULL`, individuals of each block are plotted on separate figures.
  - If `select = c(1,3)`, individuals of blocks 1 and 3 are plotted on separate figures.
- If `graphtype = "globalcor"`, correlations of original variables with the global components are depicted.
  - If `select = NULL`, correlations of the variables of all the blocks are plotted on the same figure.
  - If `select = c(1,3)`, correlations of the variables of blocks 1 and 3 are plotted.
- If `graphtype = "blockcor"`, correlations of original variables with the block components are depicted.
  - If `select = NULL`, correlations of the variables of each block are plotted on separate figures.
  - If `select = c(1,3)`, correlations of the variables of blocks 1 and 3 are plotted.
- If `graphtype = "expl"`, percentages of inertia of all the blocks explained by the global components are drawn.
  - If `graphtype = "cumexpl"`, cumulative percentages of inertia of all the blocks explained by the global components are drawn.
- If `graphtype = "crit"`, plots the values of the maximization criterion.
- If `graphtype = "contrib"`, depicts the contribution of each block of variables to the determination of the global components.

For `graphtype = "expl"`, "cumexpl", "crit" and "contrib", if `select = NULL`, all the dimensions are plotted.

But if for example, `select = 5`, only the first five dimensions are plotted.

**Value**

Returns graphs showing the relationships between blocks of variables, projection of individuals in both global and block components, the correlations of variables with the global and block components, the percentages of inertia explained by the global components and their cumulative values, the values of the maximization criterion and the contributions of the blocks to the determination of global components.

**Author(s)**

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Evelyne VIGNEAU.
**plot.MBPCA**

*Main Graphs for Multiblock Principal Components Analysis (MB-PCA)*

**Description**

Plot the main graphs for MB-PCA.

**Usage**

```r
## S3 method for class 'MBPCA'
plot(
  x, axes = c(1, 2),
  graphtype = c("globalscores", "blockscores", "globalcor", "blockcor", "expl", "cumexpl", "crit", "contrib"),
  select = NULL,
  max.overlaps = 20,
  xlim = NULL,
  ylim = NULL,
  title = NULL,
  color = NULL,
  ...
)
```

**Arguments**

- `x` An object of class MBPCA.
- `axes` A vector of length two which specifies the global components to plot (by default the first two).
- `graphtype` Type of graph to plot. Either "globalscores", "blockscores", "globalcor", "blockcor", "expl", "cumexpl", "crit" or "contrib". Refer to the details section.
- `select` Selection of elements to plot (by default, select=NULL). Refer to the details section.

**Examples**

```r
data(ham)
X=ham$X
group=ham$group
res.comdim <- ComDim(X, group, plotgraph=FALSE)
plot(res.comdim, graphtype="saliences")
plot(res.comdim, graphtype="globalcor")
```
max.overlaps Exclude text labels that overlap too many things (by default, 20).
xlim Range for the plotted 'x' values.
ylim Range for the plotted 'y' values.
title Title of the graph to draw.
color Color for the plot.
... Further arguments.

Details

The arguments graphtype and select are used as follow.
If graphtype="globalscores", individuals are projected on the space formed by the global components.
In this case, if for example, select=NULL, all the individuals are plotted. However, if select=5, only the first five individuals are plotted.
If graphtype="blockscores", individuals are projected on the space formed by the block components.
If select=NULL, individuals of each block are plotted on separate figures.
If select=c(1,3), individuals of blocks 1 and 3 are plotted on separate figures.
If graphtype="globalcor", correlations of original variables with the global components are depicted.
If select=NULL, correlations of the variables of all the blocks are plotted on the same figure.
If select=c(1,3), correlations of the variables of blocks 1 and 3 are plotted.
If graphtype="blockcor", correlations of original variables with the block components are depicted.
If select=NULL, correlations of the variables of each block are plotted on separate figures.
If select=c(1,3), correlations of the variables of blocks 1 and 3 are plotted.
If graphtype="expl", percentages of inertia of all the blocks explained by the global components are drawn.
If graphtype="cumexpl", cumulative percentages of inertia of all the blocks explained by the global components are drawn.
graphtype="crit" plots the values of the maximization criterion.
graphtype="contrib" depicts the contribution of each block of variables to the determination of the global components.
For graphtype="expl", "cumexpl", "crit" and "contrib", if select=NULL, all the dimensions are plotted.
But if for example, select=5, only the first five dimensions are plotted.

Value

Returns graphs showing the projection of individuals in both global and block components, the correlations of variables with the global and block components, the percentages of inertia explained by the global components and their cumulative values, the values of the maximization criterion and the contributions of the blocks to the determination of global components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lynne VIGNEAU.
See Also

`MBPCA`

Examples

data(ham)
X=ham$X
group=ham$group
res.mbpca <- MBPCA(X, group, plotgraph=FALSE)
plot(res.mbpca, graphtype="globalscores")

### plot.MBPLS

`plot.MBPLS` *Main Graphs for Multiblock Partial Least Squares (MB-PLS) regression*

Description

Plot the main graphs for MB-PLS regression.

Usage

```r
## S3 method for class 'MBPLS'
plot(
  x, 
  axes = c(1, 2),
  graphtype = c("globalscores", "blockscores", "globalcor", "blockcor", "explY",
                "cumexplY", "explX", "cumexplX", "crit", "contrib"),
  select = NULL,
  max.overlaps = 20,
  xlim = NULL,
  ylim = NULL,
  title = NULL,
  color = NULL,
  ...
)
```

Arguments

- **x**: An object of class MBPLS.
- **axes**: A vector of length two which specifies the global components to plot (by default the first two).
- **graphtype**: Type of graph to plot. Either "globalscores", "blockscores", "globalcor", "blockcor", "explY", "cumexplY", "explX", "cumexplX", "crit" or "contrib". Refer to the details section.
- **select**: Selection of elements to plot (by default, select=NULL). Refer to the details section.
max.overlaps  Exclude text labels that overlap too many things (by default, 20).
xlim   Range for the plotted 'x' values.
ylim   Range for the plotted 'y' values.
title  Title of the graph to draw.
color  Color for the plot.
...  Further arguments.

Details

The arguments graphtype and select are used as follow.
If graphtype="globalscores", individuals are projected on the space formed by the global components.
In this case, if for example, select=NULL, all the individuals are plotted. However, if select=5, only the first five individuals are plotted.
If graphtype="blockscores", individuals are projected on the space formed by the block components.
If select=NULL, individuals of each block are plotted on separate figures.
If select=c(1,3), individuals of blocks 1 and 3 are plotted on separate figures.
If graphtype="globalcor", correlations of original variables with the global components are depicted.
If select=NULL, correlations of the variables of all the blocks are plotted on the same figure.
If select=c(1,3), correlations of the variables of blocks 1 and 3 are plotted.
If graphtype="blockcor", correlations of original variables with the block components are depicted.
If select=NULL, correlations of the variables of each block are plotted on separate figures.
If select=c(1,3), correlations of the variables of blocks 1 and 3 are plotted.
If graphtype="explY", percentages of inertia of Y block explained by the global components are drawn.
If graphtype="cumexplY", cumulative percentages of inertia of Y block explained by the global components are drawn.
If graphtype="explX", percentages of inertia of X blocks explained by the global components are drawn.
If graphtype="cumexplX", cumulative percentages of inertia of X blocks explained by the global components are drawn.
graphtype="crit" plots the values of the maximization criterion.
graphtype="contrib" depicts the contribution of each block of variables to the determination of the global components.
For graphtype="explY", "cumexplY", "explX", "cumexplX", "crit" and "contrib", if select=NULL, all the dimensions are plotted.
But if for example, select=5, only the first five dimensions are plotted.

Value

Returns graphs showing the projection of individuals in both global and block components, the correlations of variables with the global and block components, the percentages of inertia of both Y block and X blocks explained by the global components and their cumulative values, the values of the maximization criterion and the contributions of the blocks to the determination of global components.
Author(s)
Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

See Also
MBPLS

Examples

```r
data(ham)
X=ham$X
Y=ham$Y
group=ham$group
res.mbpls <- MBPLS(X, Y, group, plotgraph=FALSE)
plot(res.mbpls, graphtype="globalscores")
plot(res.mbpls, graphtype="globalcor")
```

---

### plot.MBWCov

**Main Graphs for Multiblock Weighted Covariate analysis (MB-WCov)**

**Description**

Plot the main graphs for MB-WCov.

**Usage**

```r
## S3 method for class 'MBWCov'
plot(
  x,
  axes = c(1, 2),
graphtype = c("saliences", "globalscores", "blockscores", "globalcor", "blockcor", "explY", "cumexplY", "explX", "cumexplX", "crit", "contrib"),
  select = NULL,
  max.overlaps = 20,
  xlim = NULL,
  ylim = NULL,
  title = NULL,
  color = NULL,
  ...)
```
Arguments

- **x**
  - An object of class \texttt{MBWCov}.

- **axes**
  - A vector of length 2 which specifies the global components to plot (by default the first two).

- **graphtype**
  - Type of graph to plot. Either "saliences", "globalscores", "blockscores", "globalcor", "blockcor", "explY", "cumexplY", "explX", "cumexplX", "crit" or "contrib". Refer to the details section.

- **select**
  - Selection of elements to plot (by default, select=NULL). Refer to the details section.

- **max.overlaps**
  - Exclude text labels that overlap too many things (by default, 20).

- **xlim**
  - Range for the plotted 'x' values.

- **ylim**
  - Range for the plotted 'y' values.

- **title**
  - Title of the graph to draw.

- **color**
  - Color for the plot.

- **...**
  - Further arguments.

Details

The arguments graphtype and select are used as follow.

- If graphtype="saliences", the relationships between blocks of variables are shown. If select=NULL, all the blocks are shown, otherwise, only the selected ones are shown. If graphtype="globalscores", individuals are projected on the space formed by the global components. In this case, if for example, select=NULL, all the individuals are plotted. However, if select=5, only the first five individuals are plotted. If graphtype="blockscores", individuals are projected on the space formed by the block components. If select=NULL, individuals of each block are plotted on separate figures. If select=c(1,3), individuals of blocks 1 and 3 are plotted on separate figures. If graphtype="globalcor", correlations of original variables with the global components are depicted. If select=NULL, correlations of the variables of all the blocks are plotted on the same figure. If select=c(1,3), correlations of the variables of blocks 1 and 3 are plotted. If graphtype="blockcor", correlations of original variables with the block components are depicted. If select=NULL, correlations of the variables of each block are plotted on separate figures. If select=c(1,3), correlations of the variables of blocks 1 and 3 are plotted. If graphtype="explY", percentages of inertia of Y block explained by the global components are drawn. If graphtype="cumexplY", cumulative percentages of inertia of Y block explained by the global components are drawn. If graphtype="explX", percentages of inertia of X blocks explained by the global components are drawn. If graphtype="cumexplX", cumulative percentages of inertia of X blocks explained by the global components are drawn. graphtype="crit" plots the values of the maximization criterion.
graphtype="contrib" depicts the contribution of each block of variables to the determination of the global components.
For graphtype="explY", "cumexplY", "explX", "cumexplX", "crit" and "contrib", if select=NULL, all the dimensions are plotted.
But if for example, select=5, only the first five dimensions are plotted.

Value

Returns graphs showing relationships between the explanatory blocks of variables, the projection of individuals in both global and block components, the correlations of variables with the global and block components, the percentages of inertia of both Y block and X blocks explained by the global components and their cumulative values, the values of the maximization criterion and the contributions of the blocks to the determination of global components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

See Also

MBWCov

Examples

data(ham)
X=ham$X
Y=ham$Y
group=ham$group
res.mbwcov <- MBWCov(X, Y, group, plotgraph=FALSE)
plot(res.mbwcov, graphtype="saliences")
plot(res.mbwcov, graphtype="globalscores")
Arguments

x An object of class ComDim.

... Further arguments passed to or from other methods.

Value

Returns a list of the following elements:

components : Numeric vector of length two that indicates the number of global components of the analysis and the number of global components to print.
optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.
cumexplained : Two columns matrix of percentages of total inertia of the blocks of variables explained by the successive global components and their cumulative values.
explained.X : Matrix of percentages of inertia explained for each Xb block.
saliences : Matrix containing the specific weights of different blocks of variables on global components.
contrib : Matrix of contribution of each Xb block to the determination of global components.
T : Matrix of global components (scores of individuals).
C : Compromise matrix (unnormed global components).
globalcor : Matrix of correlation coefficients between the original variables and the global components.
cor.g.b : Array that gives the correlation of the global components with their respective block components.

Block : Results associated with each block of variables.

• T.b : Array that contains the matrices of block components.
• blockcor : List of matrices of correlation coefficients between the original variables of each block and the block components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Evelyne VIGNEAU.

See Also

ComDim

Examples

data(ham)
X=ham$X
group=ham$group
res.comdim <- ComDim(X, group, plotgraph=FALSE)
print(res.comdim)
Main Results for Multiblock Principal Components Analysis (MB-PCA)

Description
Print the main results for MB-PCA.

Usage
## S3 method for class 'MBPCA'
print(x, ...)  

Arguments
x
An object of class MBPCA.

... Further arguments passed to or from other methods.

Value
Returns a list of the following elements:

- components : Numeric vector of length two that indicates the number of global components of the analysis and the number of global components to print.
- optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.
- cumexplained : Two columns matrix of percentages of total inertia of the blocks of variables explained by the successive global components and their cumulative values.
- explained.X : Matrix of percentages of inertia explained in each Xb block.
- contrib : Matrix of contribution of each Xb block to the determination of global components.
- T : Matrix of global components (scores of individuals).
- C : Compromise matrix (unnormed global components).
- globalcor : Matrix of correlation coefficients between variables and global components.
- cor.g.b : Array that gives the correlation of the global components with their respective block components.

Block
: Results associated with each block Xb.
  - T.b : Array that contains the matrices of block components.
  - blockcor : List of matrices of correlation coefficients between the original variables of each block and the block components.

Author(s)
Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Evelyne VIGNEAU.
See Also

MBPCA

Examples

data(ham)
X=ham$X
group=ham$group
res.mbpca <- MBPCA(X, group, plotgraph=FALSE)
print(res.mbpca)

print.MBPLS

Main Results for Multiblock Partial Least Squares (MB-PLS) regression

Description

Print the main results for MB-PLS regression.

Usage

## S3 method for class 'MBPLS'
print(x, ...)

Arguments

x An object of class MBPLS.
... Further arguments passed to or from other methods.

Value

Returns a list of the following elements:

components : Numeric vector of length two that gives the number of global components of the analysis and the number of global components to print.

optimalcrit : Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.

cumexplained : Four columns matrix of percentages of total inertia of the explanatory blocks, percentages of inertia of the response block explained by the successive global components and their cumulative values.

explained.X : Matrix of percentages of inertia explained for each Xb block.

explained.Y : Matrix of percentages of inertia explained for each Y variable.

contrib : Matrix of contribution of each Xb block to the determination of global components.

T : Matrix of global components (scores of individuals).
C : Compromise matrix (unnormed global components).
U : Matrix of components associated with the response block of variables.
globalcor : Matrix of correlation coefficients between the original variables and the global components.
cor.g.b : Array that gives the correlation of the global components with their respective block components.
betaY : Array of regression coefficients.

Block : Results associated with each block of variables.
   • T.b : Array that contains the matrices of block components.
   • blockcor : List of matrices of correlation coefficients between the original variables of each block of variables and the block components.

Author(s)
Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

See Also
MBPLS

Examples

```r
data(ham)
X=ham$X
group=ham$group
Y=ham$Y
res.mbpls <- MBPLS(X, Y, group)
print(res.mbpls)
```

print.MBW Cov

Main Results for Multiblock Weighted Covariate analysis (MB-WCov)

Description
Print the main results for MB-WCov.

Usage
```
## S3 method for class 'MBW Cov'
print(x, ...)  
```

Arguments

x An object of class MBW Cov.

... Further arguments passed to or from other methods.
Value

Returns a list of the following elements:

- **components**: Numeric vector of length two that gives the number of global components of the analysis and the number of global components to print.
- **optimalcrit**: Numeric vector that gives the optimal value of the criterion to be maximized for each dimension.
- **cumexplained**: Four columns matrix of percentages of total inertia of the explanatory blocks, percentages of inertia of the response block explained by the successive global components and their cumulative values.
- **explained.X**: Matrix of percentages of inertia explained for each Xb block.
- **explained.Y**: Matrix of percentages of inertia explained for each Y variable.
- **saliences**: Matrix containing the specific weights of each explanatory block of variables on global components.
- **contrib**: Matrix of contribution of each Xb block to the determination of global components.
- **T**: Matrix of global components (scores of individuals).
- **C**: Compromise matrix ( unnormed global components).
- **U**: Matrix of components associated with the response block of variables.
- **globalcor**: Matrix of correlation coefficients between the original variables and the global components.
- **cor.g.b**: Array that gives the correlation of the global components with their respective block components.
- **betaY**: Array of regression coefficients.

**Block**

- **T.b**: Array that contains the matrices of block components.
- **blockcor**: List of matrices of correlation coefficients between the original variables of each block of variables and the block components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

See Also

*MBWCov*

Examples

```r
data(ham)
X=ham$X
group=ham$group
Y=ham$Y
res.mbwcov <- MBWCov(X, Y, group)
```
print(res.mbwcov)

summary.ComDim

---

**Summary Results for Common Dimensions analysis (ComDim)**

**Description**

Gives key results for ComDim.

**Usage**

```r
## S3 method for class 'ComDim'
summary(object, nvar = NULL, ncompprint = NULL, digits = 2, ...)
```

**Arguments**

- `object` An object of class ComDim.
- `nvar` Number of variables to print. By default (NULL), all the variables are printed.
- `ncompprint` Number of global components to print. By default (NULL), the number of global components printed for the main function ComDim.
- `digits` Number of decimal points (by default 2).
- `...` Further arguments.

**Value**

Returns the percentages of inertia explained by successive global components, their cumulative values, the saliences and the correlations of the original variables with the global components.

**Author(s)**

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

**See Also**

- ComDim

**Examples**

```r
data(ham)
X=ham$X
group=ham$group
res.comdim <- ComDim(X, group, plotgraph=FALSE)
summary(res.comdim)
```
Summary Results for Multiblock Principal Components Analysis (MB-PCA)

Description

Gives key results for MB-PCA.

Usage

```r
## S3 method for class 'MBPCA'
summary(object, nvar = NULL, ncomprint = NULL, digits = 2, ...)
```

Arguments

- `object`: An object of class MBPCA.
- `nvar`: Number of variables to print. By default (NULL), all the variables are printed.
- `ncomprint`: Number of global components to print. By default (NULL), the number of global components printed for the main function MBPCA.
- `digits`: Number of decimal points (by default 2).
- `...`: Further arguments.

Value

Returns the percentages of inertia explained by successive global components, their cumulative values and the correlations of the original variables with the global components.

Author(s)

Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

See Also

MBPCA

Examples

```r
data(ham)
X = ham$X
group = ham$group
res.mbpca <- MBPCA(X, group, plotgraph=FALSE)
summary(res.mbpca)
```
Summary Results for Multiblock Partial Least Squares (MB-PLS) regression

Description
Gives key results for MB-PLS.

Usage
## S3 method for class 'MBPLS'
summary(object, nvar = NULL, ncompprint = NULL, digits = 2, ...)

Arguments
- **object**: An object of class MBPLS.
- **nvar**: Number of variables to print. By default (NULL), all the variables are printed.
- **ncompprint**: Number of global components to print. By default (NULL), the number of global components printed for the main function MBPLS.
- **digits**: Number of decimal points (by default 2).
- **...**: Further arguments.

Value
Returns the percentages of inertia explained by successive global components (for both X and Y), their cumulative values and the correlations of the variables with the global components.

Author(s)
Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Eve-lyne VIGNEAU.

See Also
MBPLS

Examples
```
data(ham)
X=ham$X
group=ham$group
Y=ham$Y
res.mbpls <- MBPLS(X, Y, group, plotgraph=FALSE)
summary(res.mbpls)
```
Summary Results for Multiblock Weighted Covariate analysis (MB-WCov)

Description
Gives key results for MB-WCov.

Usage

```r
## S3 method for class 'MBWCov'
summary(object, nvar = NULL, ncompprint = NULL, digits = 2, ...)
```

Arguments

- `object`: An object of class `MBWCov`.
- `nvar`: Number of variables to print. By default (NULL), all the variables are printed.
- `ncompprint`: Number of global components to print. By default (NULL), the number of global components printed for the main function MBWCov.
- `digits`: Number of decimal points (by default 2).
- `...`: Further arguments.

Value
Returns the percentages of inertia explained by successive global components (for both X and Y), their cumulative values, the saliences and the correlations of the variables with the global components.

Author(s)
Essomanda TCHANDAO MANGAMANA <tchanesso@yahoo.fr>, Véronique CARIOU, Evèlyne VIGNEAU.

See Also
MBWCov

Examples

```r
data(ham)
X=ham$X
Y=ham$Y
group=ham$group
res.mbwcov <- MBWCov(X, Y, group, plotgraph=FALSE)
summary(res.mbwcov)
```
Index

* datasets
  ham, 4

  ComDim, 2, 14, 21, 26

  ham, 4

  MBPCA, 5, 16, 23, 27
  MBPLS, 7, 18, 24, 28
  MBWCov, 9, 20, 25, 29

  plot.ComDim, 4, 12
  plot.MBPCA, 7, 14
  plot.MBPLS, 9, 16
  plot.MBWCov, 11, 18
  print.ComDim, 4, 20
  print.MBPCA, 7, 22
  print.MBPLS, 9, 23
  print.MBWCov, 11, 24

  summary.ComDim, 4, 26
  summary.MBPCA, 7, 27
  summary.MBPLS, 9, 28
  summary.MBWCov, 11, 29