

Package ‘oc’

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Title OC Roll Call Analysis Software.

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Description Estimates Optimal Classification scores from roll call votes supplied though a ‘rollcall’ object from package ‘pscl’.

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Description

`oc` is the function that takes a `rollcall` object and estimates nonmetric Optimal Classification scores with them.

Usage

```
oc(rcObject, dims=2, minvotes=20, lop=0.025, polarity, verbose=FALSE)
```

Arguments

<code>rcObject</code>	An object of class <code>rollcall</code> , from Simon Jackman's <code>pscl</code> package.
<code>dims</code>	integer, number of dimensions to estimate. Must be nonnegative and cannot exceed 10 dimensions.
<code>minvotes</code>	minimum number of votes a legislator must vote in for them to be analyzed.
<code>lop</code>	A proportion between 0 and 1, the cut-off used for excluding lopsided votes, expressed as the proportion of non-missing votes on the minority side. The default, <code>lop=0.025</code> , eliminates votes where the minority is smaller than 2.5 overwrites the <code>lopsided</code> attribute in the RC object inputted.
<code>polarity</code>	a vector specifying the legislator in the data set who is conservative on each dimension. For example, <code>c(3, 5)</code> indicates legislator 3 is conservative on dimension 1, and legislator 5 is conservative on dimension 2. Alternatively, <code>polarity</code> can be specified as a string for legislator names found in <code>legis.names</code> (ie. <code>c("Bush", "Gore")</code>) if every legislative name in the data set is unique. Finally, <code>polarity</code> can be specified as a list (ie. <code>list("cd", c(4, 5))</code>) where the first list item is a variable from the roll call object's <code>legis.data</code> , and the second list item is a conservative legislator on each dimension as specified by the first list item. <code>list("cd", c(4, 5))</code> thus specifies the legislators with congressional district numbers of 4 and 5.
<code>verbose</code>	logical, indicates whether bills and legislators to be deleted should be printed while data is being checked before ideal points are estimated.

Value

An object of class `OCObject`, with elements as follows:

`legislators` data frame, containing all data from the old `perf25.dat` file about legislators. For a typical `ocObject` run with an ORD file read using `readKH`, it will contain the following:

`state` State name of legislator.

`icpsrState` ICPSR state code of legislator.

`cd` Congressional District number.

`icpsrLegis` ICPSR code of legislator.
`party` Party of legislator.
`partyCode` ICPSR party code of legislator.
`rank` Rank ordering of legislator on the first dimension, from lowest to highest.
`correctYea` Predicted Yeas and Actual Yeas.
`wrongYea` Predicted Yeas and Actual Nays.
`wrongNay` Predicted Nays and Actual Yeas.
`correctNay` Predicted Nays and Actual Nays.
`volume` Measure of the legislator's polytope size.
`coord1D` First dimension OC score, with all subsequent dimensions numbered similarly.
`rollcalls` data frame, containing all data from the old `perf21.dat` file about bills. For a typical `OCobject` object run with an ORD file read using `readKH`, it will contain the following:
`correctYea` Predicted Yeas and Actual Yeas.
`wrongYea` Predicted Yeas and Actual Nays.
`wrongNay` Predicted Nays and Actual Yeas.
`correctNay` Predicted Nays and Actual Nays.
`PRE` Proportional Reduction In Error.
`normvector1D` First dimension of the unit normal vector, with all subsequent dimensions numbered similarly.
`midpoints` The projection of the normal vector needed to get the midpoint.
`dimensions` integer, number of dimensions estimated.
`eigenvalues` A vector of roll call eigenvalues.
`fits` A vector of length 2 with the classic measures of fit, containing the percent correct classification and the APRE.

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References

Keith Poole. 2000. 'Non-parametric Unfolding of Binary Choice Data.' *Political Analysis*, 8(3):211-237
 Keith Poole. 2005. 'Spatial Models of Parliamentary Voting.' Cambridge: Cambridge University Press.
 Keith Poole. <http://voteview.ucsd.edu/>

See Also

'[plot.OCobject](#)', '[summary.OCobject](#)'.

Examples

```
#This data file is the same as reading file using:
#sen90 <- readKH("ftp://voteview.com/sen90kh.ord")
#All ORD files can be found on www.voteview.com
data(sen90)

summary(sen90)
result<-oc(sen90,dims=2,polarity=c(7,2))
summary(result)
plot(result)
```

plot.OAngles

Optimal Classification Cutting Line Angles Plot

Description

plot.angles reads an Optimal Classification object and plots a histogram of the angles of the cutlines for two dimensions. plot.angles does not work for one-dimensional OObject objects.

Usage

```
plot.OAngles(x, main.title="Cutting Line Angles",
             x.title="Angle in Degrees", y.title="Count",
             dims=c(1,2), ...)
```

Arguments

x	an OObject output object.
main.title	string, coordinate plot title.
x.title	string, x-axis label.
y.title	string, y-axis label.
dims	vector of length 2, specifying the dimensions to be plotted.
...	other arguments to hist.

Value

A cutting line angle plot.

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See Also

'oc', 'plot.OCcoords', 'plot.OCskree', 'plot.OCcutlines', 'plot.OCobject'

Examples

```
#This data file is the same as that obtained using:
#data(sen90)
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))

data(sen90oc)
summary(sen90oc)
plot.OCangles(sen90oc)
```

plot.OCcoords

Optimal Classification Coordinate Plot

Description

plot.coords reads an Optimal Classification object in 2 user-specified dimensions and plots the coordinates of each member, applying separate colors and shapes to each party by default. A unit circle is included to emphasize the constraints on the Optimal Classification coordinates, and options to select non-party attributes of legislators are included. For a 1D OCobject object, Optimal Classification ranks are plotted against themselves, so they appear on a straight line.

Usage

```
plot.OCcoords(x, main.title="OC Coordinates",
             d1.title="First Dimension", d2.title="Second Dimension", dims=c(1,2),
             plotBy="party", color=TRUE, shape=TRUE, cutline=NULL, Legend=TRUE,
             legend.x=0.8, legend.y=1, ...)
```

Arguments

x	an OCobject output object.
main.title	string, coordinate plot title.
d1.title	string, x-axis label.
d2.title	string, y-axis label.
dims	vector of length 2, specifying the dimensions to be plotted.
plotBy	string, name of a variable in OCobject\$legislators. plot.coords will plot coordinates using this variable as a selector.
color	logical, marks different groups specified by plotBy using different colors if TRUE.
shape	logical, marks different groups specified by plotBy using different shapes if TRUE.
cutline	vector, selects roll calls by row number for which a cutting line is desired.

Legend	logical, include a generic legend.
legend.x	numeric, corresponds to the 'x' argument of legend().
legend.y	numeric, corresponds to the 'y' argument of legend().
...	other arguments to symbols.

Value

A coordinate plot.

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See Also

'oc', 'plot.OCSkree', 'plot.OCAngles', 'plot.OCCutlines', 'plot.OCObject'

Examples

```
#This data file is the same as that obtained using:
#data(sen90)
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))

data(sen90oc)
summary(sen90oc)
plot.OCCoords(sen90oc)
```

plot.OCCutlines *Optimal Classification Cutline Plot*

Description

plot.cutlines reads an Optimal Classification object and plots the cutting line of a specified proportion of all votes along two user-specified dimensions. The default is to plot 50 cutting lines. This is also known as a Coombs mesh. A unit circle is included to emphasize the constraints on the Optimal Classification coordinates. Only cutlines that are constrained to have midpoints lying in a unit circle are included. plot.cutlines does not work for 1D OCObject objects.

Usage

```
plot.OCCutlines(x, main.title="Cutting Lines",
               d1.title="First Dimension", d2.title="Second Dimension",
               lines=50,dims=c(1,2),lwd=2,...)
```

Arguments

`x` an `OCobject` output object.
`main.title` string, coordinate plot title.
`d1.title` string, x-axis label.
`d2.title` string, y-axis label.
`lines` numeric, number of non-constrained cutlines to be plotted. If this number exceeds total number of cutlines, then all cutlines are plotted.
`dims` numeric vector of length 2, specifying dimensions to be plotted.
`lwd` numeric, line width.
`...` other arguments to `symbols`.

Value

A Coombs mesh.

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See Also

'[oc](#)', '[plot.OCcoords](#)', '[plot.OCskree](#)', '[plot.OCangles](#)', '[plot.OCobject](#)'

Examples

```
#This data file is the same as that obtained using:  
#data(sen90)  
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))  
  
data(sen90oc)  
summary(sen90oc)  
plot.OCcutlines(sen90oc)
```

`plot.OCobject`*Optimal Classification Summary Plot*

Description

`plot.OCobject` reads an Optimal Classification object in two user-specified dimensions and plots the coordinates, cutting lines, a Coombs mesh, and a Skree plot. For one-dimensional `OCobject` objects, it plots a one-dimensional coordinate plot along with a Skree plot.

Usage

```
plot.OCobject(x, dims=c(1,2), ...)
```

Arguments

`x` an `OCobject` output object.
`dims` a vector of length 2, specifying the two dimensions to be plotted.
`...` other arguments do nothing and are not passed to any plot functions.

Value

A summary plot of an `OCobject` object.

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See Also

'[oc](#)', '[plot.OCcoords](#)', '[plot.OCskree](#)', '[plot.OCangles](#)', '[plot.OCcutlines](#)'

Examples

```
#This data file is the same as that obtained using:  
#data(sen90)  
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))  
  
data(sen90oc)  
summary(sen90oc)  
plot(sen90oc)
```

plot.OCskree *Optimal Classification Skree Plot*

Description

plot.skree is the function that takes an Optimal Classification object and plots a Skree plot. Skree plots show the dimensionality of the voting by showing the sizes of the eigenvalues.

Usage

```
plot.OCskree(x, main.title="Skree Plot", x.title="Dimension",
             y.title="Eigenvalue", ...)
```

Arguments

x	an OObject output object.
main.title	string, Skree plot title.
x.title	string, x-axis label.
y.title	string, y-axis label.
...	other arguments to plot.

Value

A Skree plot, showing the first 20 eigenvalues.

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See Also

'oc', 'plot.OCcoords', 'plot.OCangles', 'plot.OCcutlines', 'plot.OCobject'

Examples

```
#This data file is the same as that obtained using:
#data(sen90)
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))

data(sen90oc)
summary(sen90oc)
plot.OCskree(sen90oc)
```

sen90

*90th U.S. Senate Roll Call Vote Matrix***Description**

This dataframe contains a matrix of votes cast by U.S. Senators in the 90th Congress. The data are formatted consistent with the `rollcall` object format in Simon Jackman's `pscl` package.

Usage

```
data(sen90)
```

Value

The dataframe contains roll call data for all Senators in the 90th Senate. The data is formatted as a `rollcall` object with the following elements.

<code>votes</code>	data frame, containing all data from the old <code>nom31.dat</code> file about legislators. For a typical W-NOMINATE object run with an ORD file read using <code>readKH</code> , it will contain the following:
	<code>state</code> State name of legislator.
	<code>icpsrState</code> ICPSR state code of legislator.
	<code>cd</code> Congressional District number.
	<code>icpsrLegis</code> ICPSR code of legislator.
	<code>party</code> Party of legislator.
	<code>partyCode</code> ICPSR party code of legislator.
<code>codes</code>	list of four vectors. <code>yea</code> shows the codes in <code>votes</code> that are yea votes, <code>'nay'</code> shows nay codes, <code>notInLegis</code> shows absences, and <code>missing</code> shows the missing codes.
<code>n</code>	numeric, number of legislators
<code>m</code>	numeric, number of roll calls
<code>legis.data</code>	data frame, containing the following information on legislators:
	<code>state</code> State name of legislator.
	<code>icpsrState</code> ICPSR state code of legislator.
	<code>cd</code> Congressional District number.
	<code>icpsrLegis</code> ICPSR code of legislator.
	<code>party</code> Party of legislator.
	<code>partyCode</code> ICPSR party code of legislator.
<code>vote.data</code>	null, would otherwise be a data frame containing data on the votes.
<code>desc</code>	null, would otherwise be a string describing the data set.
<code>source</code>	string, describing where data set was read from.

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Source

Keith Poole. 2005. *90th Senate Roll Call Vote Data*. <http://www.voteview.com/>.

See Also

'oc'.

Examples

```
#This data file is the same as reading file using:
#sen90 <- readKH("ftp://voteview.com/sen90kh.ord")
#All ORD files can be found on www.voteview.com
data(sen90)

summary(sen90)
result<-oc(sen90,polarity=c(2,5))
summary(result)
plot(result)
```

 sen90oc

90th U.S. Senate Ideal Points via Optimal Classification

Description

This dataframe contains the estimated ideal points of the 90th U.S Senate using `oc`. Although it can easily be obtained from calling the example in `oc`, it is included here to facilitate illustration of the examples for the plot and summary functions.

Usage

```
data(sen90oc)
```

Value

An object of class `OCobject`, with elements as follows:

`legislators` data frame, containing all data from the old `perf25.dat` file about legislators. For a typical `ocObject` run with an ORD file read using `readKH`, it will contain the following:

`state` State name of legislator.

icpsrState ICPSR state code of legislator.
 cd Congressional District number.
 icpsrLegis ICPSR code of legislator.
 party Party of legislator.
 partyCode ICPSR party code of legislator.
 rank Rank ordering of legislator on the first dimension, from lowest to highest.
 correctYea Predicted Yeas and Actual Yeas.
 wrongYea Predicted Yeas and Actual Nays.
 wrongNay Predicted Nays and Actual Yeas.
 correctNay Predicted Nays and Actual Nays.
 volume Measure of the legislator's polytope size.
 coord1D First dimension OC score, with all subsequent dimensions numbered similarly.
 rollcalls data frame, containing all data from the old `perf21.dat` file about bills. For a typical `OCobject` object run with an ORD file read using `readKH`, it will contain the following:
 correctYea Predicted Yeas and Actual Yeas.
 wrongYea Predicted Yeas and Actual Nays.
 wrongNay Predicted Nays and Actual Yeas.
 correctNay Predicted Nays and Actual Nays.
 PRE Proportional Reduction In Error.
 normvector1D First dimension of the unit normal vector, with all subsequent dimensions numbered similarly.
 midpoints The projection of the normal vector needed to get the midpoint.
 dimensions integer, number of dimensions estimated.
 eigenvalues A vector of roll call eigenvalues.
 fits A vector of length 2 with the classic measures of fit, containing the percent correct classification and the APRE.

Author(s)

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Source

Keith Poole. 2005. *90th Senate Roll Call Vote Data*. <http://www.voteview.com/>.

See Also

'oc', 'plot.OCcoords', 'plot.OCskree', 'plot.OCangles', 'plot.OCcutlines', 'plot.OCobject'

Examples

```
#This data file is the same as that obtained using:
#data(sen90)
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))

data(sen90oc)
summary(sen90oc)
plot(sen90oc)
```

summary.OCobject *Optimal Classification Summary*

Description

summary.OCobject reads an Optimal Classification object and prints a summary.

Usage

```
summary.OCobject(object, verbose=FALSE, ...)
```

Arguments

object	an OCobject output object.
verbose	logical, includes all ideal points if TRUE, otherwise only returns the first 10 legislators.
...	other arguments do nothing and are not passed to any functions.

Value

A summary of a OCobject object.

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 Royce Carroll <rcarroll@ucsd.edu>

See Also

'oc', 'plot.OCcoords', 'plot.OCskree', 'plot.OCangles', 'plot.OCcutlines', 'plot.OCobject'

Examples

```
#This data file is the same as that obtained using:
#data(sen90)
#sen90oc<-oc(sen90,dims=2,polarity=c(7,2))

data(sen90oc)
summary(sen90oc)
plot(sen90oc)
```

UN

United Nations Vote Data

Description

This data frame contains votes from the first three sessions of the United Nations. The same data can also be downloaded as a CSV file from www.voteview.com. The object of this data set is to provide an example of how one might use the W-NOMINATE package on a set of roll call votes not already stored in ORD format.

Usage

```
data(UN)
```

Value

This data frame contains votes from the first three sessions of the United Nations. The first column are country names, while the second column indicates membership in the former Warsaw Pact (used as a 'party' variable). Yeas are coded 1, 2, and 3, nays are coded 4, 5, and 6, missing votes are coded 7, 8, and 9, and not being in the General Assembly is coded as a 0.

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Source

Keith Poole. 2005. *UN Vote Data*. <http://www.voteview.com/>.

See Also

'oc'.

Examples

```
#The same data set can be obtained from downloading the UN.csv
#file from www.voteview.com and reading it as follows:
#UN<-read.csv("C:/UN.csv",header=FALSE,strip.white=TRUE)

data(UN)
UN<-as.matrix(UN)
UN[1:5,1:6]

UNnames<-UN[,1]
legData<-matrix(UN[,2],length(UN[,2]),1)
colnames(legData)<-"party"
UN<-UN[,-c(1,2)]

rc <- rollcall(UN, yea=c(1,2,3), nay=c(4,5,6),
missing=c(7,8,9),notInLegis=0, legis.names=UNnames,
legis.data=legData,
desc="UN Votes",
source="www.voteview.com")

result<-oc(rc,polarity=1,dims=1)
plot(result)
summary(result)
```

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