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Description Provides functions to estimate latent dimensions of choice and judgment using Aldrich-McKelvey and Blackbox scaling methods, as described in Poole et al. (2016, <doi:10.18637/jss.v069.i07>). These techniques allow researchers (particularly those analyzing political attitudes, public opinion, and legislative behavior) to recover spatial estimates of political actors' ideal points and stimuli from issue scale data, accounting for perceptual bias, multidimensional spaces, and missing data. The package uses singular value decomposition and alternating least squares (ALS) procedures to scale self-placement and perceptual data into a common latent space for the analysis of ideological or evaluative dimensions. Functionality also include tools for assessing model fit, handling complex survey data structures, and reproducing simulated datasets for methodological validation.

License GPL-2

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`aldmck` *Aldrich-McKelvey Scaling*

Description

`aldmck` is a function that takes a matrix of perceptual data, such as liberal-conservative rankings of various stimuli, and recovers the true location of those stimuli in a spatial model. It differs from procedures such as `wnominate`, which instead use preference data to estimate candidate and citizen positions. The procedure here, developed by John Aldrich and Richard McKelvey in 1977, is restricted to estimating data with no missing values and only in one dimension. Please refer to the `blackbox` and `blackbox_transpose` functions in this package for procedures that accomodate missing data and multidimensionality estimates.

Usage

```
aldmck(data, respondent=0, missing=NULL, polarity, verbose=FALSE)
```

Arguments

data	matrix of numeric values, containing the perceptual data. Respondents should be organized on rows, and stimuli on columns. It is helpful, though not necessary, to include row names and column names.
respondent	integer, specifies the column in the data matrix of the stimuli that contains the respondent's self-placement on the scale. Setting respondent = 0 specifies that the self-placement data is not available. Self-placement data is not required to estimate the locations of the stimuli, but is required if recovery of the respondent ideal points, or distortion parameters is desired. Note that no distortion parameters are estimated in AM without self-placements because they are not needed, see equation (24) in Aldrich and McKelvey (1977) for proof.
missing	vector or matrix of numeric values, sets the missing values for the data. NA values are always treated as missing regardless of what is set here. Observations with missing data are discarded before analysis. If input is a vector, then the vector is assumed to contain the missing value codes for all the data. If the input is a matrix, it must be of dimension p x q, where p is the maximum number of missing values and q is the number of columns in the data. Each column of the inputted matrix then specifies the missing data values for the respective variables in data. If null (default), no missing values are in the data other than the standard NA value.
polarity	integer, specifies the column in the data matrix of the stimuli that is to be set on the left side (generally this means a liberal)
verbose	logical, indicates whether aldmck should print out detailed output when scaling the data.

Value

An object of class aldmck.

legislators	vector, containing the recovered locations of the stimuli. The names of the stimuli are attached if provided as column names in the argument data, otherwise they are generated sequentiall as 'stim1', 'stim2', etc.
respondents	matrix, containing the information estimated for each respondent. Observations which were discarded in the estimation for missing data purposes have been NA'd out:

intercept Intercept of perceptual distortion for respondent.

weight Weight of perceptual distortion for respondent.

idealpt Estimated location of the respondent. Note that these positions are still calculated for individuals with negative weights, so these may need to be discarded. Note that this will not be calculated if self-placements are not provided in the data.

selfplace The self-reported location of the individual, copied from the data argument if respondent is not set to 0.

`polinfo` Estimated political information of respondent, calculated as the correlation between the true and reported stimulus locations. The validation of this measure is provided in the article by Palfrey and Poole in the references. Note that this measure is included even for respondents that were not used in the estimation. Individuals with negative weights have also been assigned a political information score of 0, rather than negative scores.

`eigenvalues` A vector of the eigenvalues from the estimation.

`AMfit` Ratio of overall variance to perceptions in scaled data divided by average variance. This measure of fit, described by Aldrich and McKelvey, measures the amount of reduction of the variance of the scaled over unscaled data.

`N` Number of respondents used in the estimation (i.e. had no missing data)

`N.neg` Number of cases with negative weights. Only calculated if respondent self-placements are specified, will equal 0 if not.

`N.pos` Number of cases with positive weights. Only calculated if respondent self-placements are specified, will equal 0 if not.

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

David A. Armstrong II, Ryan Bakker, Royce Carroll, Christopher Hare, Keith T. Poole, and Howard Rosenthal. 2021. *Analyzing Spatial Models of Choice and Judgment*. 2nd ed. Statistics in the Social and Behavioral Sciences Series. Boca Raton, FL: Chapman & Hall/CRC. doi: 10.1201/9781315197609

Thomas R. Palfrey and Keith T. Poole. 1987. "The Relationship between Information, Ideology, and Voting Behavior." *American Journal of Political Science* 31(3): 511-530. doi: 10.2307/2111281

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'LC1980', 'summary.aldmck', 'plot.aldmck', 'plot.cdf'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)

result <- aldmck(data=LC1980, polarity=2, respondent=1,
 missing=c(0,8,9), verbose=FALSE)

summary(result)
plot.aldmck(result)
```

---

blackbox *Blackbox Scaling*

Description

blackbox is a function that takes a matrix of survey data in which individuals place themselves on continuous scales across multiple issues, and locates those citizens in a spatial model of voting. Mathematically, this function generalizes the singular value of a matrix to cases in which there is missing data in the matrix. Scales generated using perceptual data (i.e. scales of legislator locations using liberal-conservative rankings by survey respondents) should instead use the blackbox_transpose function in this package instead.

Usage

```
blackbox(data, missing=NULL, verbose=FALSE, dims=1, minscale)
```

Arguments

data	matrix of numeric values containing the issue scale data. Respondents should be organized on rows, and stimuli on columns. It is helpful, though not necessary, to include row names and column names.
missing	vector or matrix of numeric values, sets the missing values for the data. NA values are always treated as missing regardless of what is set here. Observations with missing data are discarded before analysis. If input is a vector, then the vector is assumed to contain the missing value codes for all the data. If the input is a matrix, it must be of dimension p x q, where p is the maximum number of missing values and q is the number of columns in the data. Each column of the inputted matrix then specifies the missing data values for the respective variables in data. If null (default), no missing values are in the data other than the standard NA value.
verbose	logical, indicates whether aldmck should print out detailed output when scaling the data.
dims	integer, specifies the number of dimensions to be estimated.
minscale	integer, specifies the minimum number of responses a respondent needs needs to provide to be used in the scaling.

Value

An object of class `blackbox`.

`stimuli` vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Each row contains data on a separate stimulus, and each data frame includes the following variables:

- `N` Number of respondents who provided a response to this stimulus.
- `c` Stimulus intercept.
- `w1` Estimate of the stimulus weight on the first dimension. If viewing the results for a higher dimension, higher dimension results will appear as w2, w3, etc.
- `R2` The percent variance explained for the stimulus. This increases as more dimensions are estimated.

`individuals` vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Individuals that are discarded from analysis due to the minscale constraint are NA'd out. Each row contains data on a separate stimulus, and each data frame includes the following variables:

- `c1` Estimate of the individual intercept on the first dimension. If viewing the results for a higher dimension, higher dimension results will appear as c2, c3, etc.

`fits` A data frame of fit results, with elements listed as follows:

`SSE` Sum of squared errors.

`SSE.explained` Explained sum of squared error.

`percent` Percentage of total variance explained.

`SE` Standard error of the estimate, with formula provided on pg. 973 of the article cited below.

`singular` Singluar value for the dimension.

`Nrow` Number of rows/stimuli.

`Ncol` Number of columns used in estimation. This may differ from the data set due to columns discarded due to the minscale constraint.

`Ndata` Total number of data entries.

`Nmiss` Number of missing entries.

`SS_mean` Sum of squares grand mean.

`dims` Number of dimensions estimated.

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References

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See Also

'Issues1980', 'summary.blackbox', 'plot.blackbox'.

Examples

```
### Loads issue scales from the 1980 NES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

summary(Issues1980_bb)
```

---

blackbox_transpose *Blackbox transpose Scaling*

Description

`blackbox_transpose` is a function that takes a matrix of perceptual data, such as liberal-conservative rankings of various stimuli, and recovers the true location of those stimuli in a spatial model. It differs from procedures such as `wnominate`, which instead use preference data to estimate candidate and citizen positions. The procedure here generalizes the technique developed by John Aldrich and Richard McKelvey in 1977, which is also included in this package as the `aldmck` function.

Usage

```
blackbox_transpose(data, missing=NULL, verbose=FALSE, dims=1, minscale)
```

Arguments

data	matrix of numeric values, containing the perceptual data. Respondents should be organized on rows, and stimuli on columns. It is helpful, though not necessary, to include row names and column names.
missing	vector or matrix of numeric values, sets the missing values for the data. NA values are always treated as missing regardless of what is set here. Observations with missing data are discarded before analysis. If input is a vector, then the vector is assumed to contain the missing value codes for all the data. If the input is a matrix, it must be of dimension p x q, where p is the maximum number of missing values and q is the number of columns in the data. Each column of the inputted matrix then specifies the missing data values for the respective variables in data. If null (default), no missing values are in the data other than the standard NA value.
verbose	logical, indicates whether aldmck should print out detailed output when scaling the data.
dims	integer, specifies the number of dimensions to be estimated.
minscale	integer, specifies the minimum number of responses a respondent needs needs to provide to be used in the scaling.

Value

An object of class blackbt.

stimuli	vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Each row contains data on a separate stimulus, and each data frame includes the following variables:
	N Number of respondents who ranked this stimulus.
	coord1D Location of the stimulus in the first dimension. If viewing the results for a higher dimension, higher dimension results will appear as coord2D, coord3D, etc.
	R2 The percent variance explained for the stimulus. This increases as more dimensions are estimated.
individuals	vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Individuals that are discarded from analysis due to the minscale constraint are NA'd out. Each row contains data on a separate stimulus, and each data frame includes the following variables:
	c Estimate of the individual intercept.
	w1 Estimate of the individual slope. If viewing the results for a higher dimension, higher dimension results will appear as w2, w3, etc.
	R2 The percent variance explained for the respondent. This increases as more dimensions are estimated.
fits	A data frame of fit results, with elements listed as follows:

SSE Sum of squared errors.

`SSE.explained` Explained sum of squared error.

`percent` Percentage of total variance explained.

`SE` Standard error of the estimate, with formula provided in the article cited below.

`singular` Singluar value for the dimension.

`Nrow`	Number of rows/stimuli.
`Ncol`	Number of columns used in estimation. This may differ from the data set due to columns discarded due to the minscale constraint.
`Ndata`	Total number of data entries.
`Nmiss`	Number of missing entries.
`SS_mean`	Sum of squares grand mean.
`dims`	Number of dimensions estimated.

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References

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See Also

'plotcdf.blackbt', 'LC1980', 'plot.blackbt', 'summary.blackbt', 'LC1980_bbt'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements


LC1980_bbt <- blackbox_transpose(LCdat, missing=c(0,8,9), dims=3,
  minscale=5, verbose=FALSE)
```

```
### 'LC1980_bbt' can be retrieved quickly with:
data(LC1980_bbt)

summary(LC1980_bbt)
plot(LC1980_bbt)
```

`boot_aldmck` *Bootstrap of Aldrich-McKelvey Scaling*

Description

`boot_aldmck` is a function automates the non-parametric bootstrapping of `aldmck`. The original function takes a matrix of perceptual data, such as liberal-conservative rankings of various stimuli, and recovers the true location of those stimuli in a spatial model. The bootstrap simply applies this estimator across multiple resampled data sets and stores the results of each iteration in a matrix. These results can be used to estimate uncertainty for various parameters of interest, and can be plotted using the `plot.boot_aldmck` function.

Usage

```
boot_aldmck(data, respondent = 0, missing=NULL, polarity, iter=100)
```

Arguments

`data`	matrix of numeric values, containing the perceptual data. Respondents should be organized on rows, and stimuli on columns. It is helpful, though not necessary, to include row names and column names.
`respondent`	integer, specifies the column in the data matrix of the stimuli that contains the respondent's self-placement on the scale. Setting respondent = 0 specifies that the self-placement data is not available. Self-placement data is not required to estimate the locations of the stimuli, but is required if recovery of the respondent ideal points, or distortion parameters is desired. Note that no distortion parameters are estimated in AM without self-placements because they are not needed, see equation (24) in Aldrich and McKelvey (1977) for proof.
`missing`	vector or matrix of numeric values, sets the missing values for the data. NA values are always treated as missing regardless of what is set here. Observations with missing data are discarded before analysis. If input is a vector, then the vector is assumed to contain the missing value codes for all the data. If the input is a matrix, it must be of dimension p x q, where p is the maximum number of missing values and q is the number of columns in the data. Each column of the inputted matrix then specifies the missing data values for the respective variables in data. If null (default), no missing values are in the data other than the standard NA value.
`polarity`	integer, specifies the column in the data matrix of the stimuli that is to be set on the left side (generally this means a liberal)
`iter`	integer, is the number of iterations the bootstrap should run for.

Value

An object of class `boot_aldmck`. This is simply a matrix of dimensions iter x number of stimuli. Each row stores the estimated stimuli locations for each iteration.

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'LC1980', 'summary.aldmck', 'plot.aldmck', 'plot.cdf'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)

result <- boot_aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), iter=30)

plot(result)
```

boot_blackbt *Bootstrap of Blackbox Transpose Scaling*

Description

boot_blackbt is a function automates the non-parametric bootstrapping of blackbox_transpose. The original function takes a matrix of perceptual data, such as liberal-conservative rankings of various stimuli, and recovers the true location of those stimuli in a spatial model. The bootstrap simply applies this estimator across multiple resampled data sets and stores the results of each iteration in a matrix. These results can be used to estimate uncertainty for various parameters of interest, and can be plotted using the plot.boot_blackbt function.

Usage

```
boot_blackbt(data, missing=NULL, dims=1, dim.extract=dims, minscale,
  iter=100, verbose=FALSE)
```

Arguments

data	matrix of numeric values, containing the perceptual data. Respondents should be organized on rows, and stimuli on columns. It is helpful, though not necessary, to include row names and column names.
missing	vector or matrix of numeric values, sets the missing values for the data. NA values are always treated as missing regardless of what is set here. Observations with missing data are discarded before analysis. If input is a vector, then the vector is assumed to contain the missing value codes for all the data. If the input is a matrix, it must be of dimension p x q, where p is the maximum number of missing values and q is the number of columns in the data. Each column of the inputted matrix then specifies the missing data values for the respective variables in data. If null (default), no missing values are in the data other than the standard NA value.
dims	integer, specifies the number of dimensions to be estimated.
dim.extract	integer, specifies which dimension to extract results for the bootstrap from.
minscale	integer, specifies the minimum number of responses a respondent needs needs to provide to be used in the scaling.
iter	integer, number of iterations the bootstrap should run for.
verbose	logical, indicates whether the progress of blackbox_transpose (at each 10th iteration) should be printed to the screen.

Value

An object of class boot_blackbt. This is simply a matrix of dimensions iter x number of stimuli. Each row stores the estimated stimuli locations for each iteration.

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox_transpose', 'plot.boot_blackbt'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements


  bootbbt <- boot_blackbt(LCdat, missing=c(0,8,9), dims=1,
    minscale=8, iter=10, verbose=FALSE)

### 'LC1980_bbt' can be retrieved quickly with:
data(bootbbt)

plot.boot_blackbt(bootbbt)
```

`bootbbt` *Blackbox Transpose Bootstrap of 1980 Liberal-Conservative Scales.*

Description

Output from 10 bootstrap trials of LC1980 data. Included to allow the example to run sufficiently quickly to pass CRAN guidelines.

Usage

```
data(bootbbt)
```

Value

See 'boot_blackbt'.

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'LC1980', 'boot_blackbt', 'plot.boot_blackbt'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements


  bootbbt <- boot_blackbt(LCdat, missing=c(0,8,9), dims=1, minscale=8, iter=10)

### 'LC1980_bbt' can be retrieved quickly with:
data(bootbbt)

plot.boot_blackbt(bootbbt)
```

colombia *2004 PELA Liberal-Conservative Scales.*

Description

Liberal-Conservative 10-point scales from the University of Salamanca's Parliamentary Elites of Latin America (PELA) survey. Stored as a matrix of integers. The number 99 is a missing value. These data come from Sebastian Saiegh and are used in the paper and book cited below.

Usage

```
data(colombia)
```

Value

The data is formatted as an integer matrix with the following elements.

`colombia` matrix, containing reported placements of various stimuli on a 10 point Liberal-Conservative scale:

`id` Respondent ID.
`party` Respondent party.
`departam` Respondent district.
`entrey` Interviewer ID.
`pl_uribista` Placement of "Partido Liberal Uribista" on 10 point scale.
`pl_oficial` Placement of "Partido Liberal Oficial" on 10 point scale.
`conservator` Placement of "Partido Conservador" on 10 point scale.
`polo` Placement of "Polo" on 10 point scale.
`union_cristiana` Placement of "Union Cristiana" on 10 point scale.
`salvation` Placement of "Salvacion" on 10 point scale.
`urine` Placement of Mr. Uribe on 10 point scale.
`antanas` Placement of Mr. Antanas on 10 point scale.
`gomez` Placement of Mr. Gomez on 10 point scale.
`garzon` Placement of Garzon on 10 point scale.
`holgin` Placement of Holguin on 10 point scale.
`rivera` Placement of Rivera on 10 point scale.
`self` Respondent self placement on 10 point scale.

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Source

Sebastian Saiegh. 2009. "Recovering a Basic Space from Elite Surveys: Evidence from Latin America." *Legislative Studies Quarterly* 34(1): 117-145. doi: 10.3162/036298009787500349

Sebastian Saiegh. 2011. *Ruling By Statute: How Uncertainty and Vote-Buying Shape Lawmaking*. New York: Cambridge University Press. doi: 10.1017/CBO9780511842276

References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

David A. Armstrong II, Ryan Bakker, Royce Carroll, Christopher Hare, Keith T. Poole, and Howard Rosenthal. 2021. *Analyzing Spatial Models of Choice and Judgment*. 2nd ed. Statistics in the Social and Behavioral Sciences Series. Boca Raton, FL: Chapman & Hall/CRC. doi: 10.1201/9781315197609

Thomas R. Palfrey and Keith T. Poole. 1987. "The Relationship between Information, Ideology, and Voting Behavior." *American Journal of Political Science* 31(3): 511-530. doi: 10.2307/2111281

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See Also

'aldmck', 'summary.aldmck', 'plot.aldmck', 'plot.cdf'.

Examples

```
### Loads the Liberal-Conservative scales from the 2004 PELA survey.
data(colombia)
tmp <- colombia[,c(5:8,12:17)]

result <- aldmck(data=tmp, polarity=7, respondent=10, missing=c(99), verbose=TRUE)
summary(result)
plot.cdf(result)
```

`fit` *Extraction function for fit of scaling model*

Description

`fit` is a convenience function to extract the model fit statistics from an `aldmck`, `blackbox`, or `blackbt` object.

Usage

```
fit(object)
```

Arguments

`object`	an `aldmck`, `blackbox`, or `blackbt` output object.

Value

The model fit statistics of the estimated output, which can also be recovered as `object$fits` (for `blackbox` or `blackbt` objects) or `object$AMfit` (for `aldmck` objects). Please refer to the documentation of `aldmck`, `blackbox`, or `blackbox_transpose` for specifics.

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References

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Keith T. Poole, Jeffrey B. Lewis, Howard Rosenthal, James Lo, and Royce Carroll. 2016. "Recovering a Basic Space from Issue Scales in R." *Journal of Statistical Software* 69(7): 1-21. doi:10.18637/jss.v069.i07

Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'blackbox', 'blackbox_transpose'.

Examples

```
### Loads issue scales from the 1980 NES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)
```

```
### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

fit(Issues1980_bb)
```

`individuals` *Extraction function for scaled individuals*

Description

`individuals` is a convenience function to extract the individual/respondent parameters from an `aldmck`, `blackbox`, or `blackbt` object.

Usage

```
individuals(object)
```

Arguments

`object`	an `aldmck`, `blackbox`, or `blackbt` output object.

Value

The individual parameters of the estimated output, which can also be recovered as `object$individuals` (for `blackbox` or `blackbt` objects) or `object$respondents` (for `aldmck` objects). Please refer to the documentation of `aldmck`, `blackbox`, or `blackbox_transpose` for specifics.

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'blackbox', 'blackbox_transpose'.

Examples

```
### Loads issue scales from the 1980 NES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

individuals(Issues1980_bb)
```

`Issues1980` *1980 Issues Scakes*

Description

Issue scales from the 1980 National Election Study. The numbers 0, 8, and 9 are considered to be missing values, except for the two abortion scales, where '7' is also a missing value. Hence, it must be recoded as in the example shown below before scaling. The data is used as an example for blackbox().

Usage

```
data(LC1980)
```

Value

The data is formatted as an numeric matrix with the following elements.

`Issues` matrix, containing reported self-placements along various stimuli on a 7 point Liberal-Conservative scales (with the exception of abortion scales, which are 4 point):

`libcon1` Liberal-conservative self-placement on 7 point scale.
`defense` Defense spending self-placement on 7 point scale.
`govserv` Government service on 7 point scale.
`inflation` Importance of inflation self-placement on 7 point scale.
`abortion1` Attitude on abortion 4 point scale.
`taxcut` Support for tax cut on 7 point scale.
`libcon2` Liberal-conservative self-placement on 7 point scale.
`govhelpmin` Government aid on 7 point scale.
`russia` Attitude towards Russia on 7 point scale.
`womenrole` Role of women on 7 point scale.
`govjobs` Placement of Democrats on 7 point scale.
`equalrights` Support for equal rights on 7 point scale.
`busing` Opinion on busing on 7 point scale.
`abortion2` Another attitude on abortion on 4 point scale.

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Source

American National Election Studies (https://electionstudies.org/)

References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox', 'summary.blackbox'.

Examples

```
### Loads issue scales from the 1980 ANES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

summary(Issues1980_bb)
```

Issues1980_bb *Blackbox Estimate, 1980 ANES Issue Scales.*

Description

Blackbox estimates from issues scales from the 1980 American National Election Study.

Usage

```
data(Issues1980_bb)
```

Value

An object of class `blackbox`.

`stimuli` vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Each row contains data on a separate stimulus, and each data frame includes the following variables:

- `N` Number of respondents who provided a response to this stimulus.
- `c` Stimulus intercept.
- `w1` Estimate of the stimulus weight on the first dimension. If viewing the results for a higher dimension, higher dimension results will appear as w2, w3, etc.
- `R2` The percent variance explained for the stimulus. This increases as more dimensions are estimated.

`individuals` vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Individuals that are discarded from analysis due to the minscale constraint are NA'd out. Each row contains data on a separate stimulus, and each data frame includes the following variables:

c1 Estimate of the individual intercept on the first dimension. If viewing the results for a higher dimension, higher dimension results will appear as c2, c3, etc.

fits A data frame of fit results, with elements listed as follows:

SSE Sum of squared errors.

SSE.explained Explained sum of squared error.

percent Percentage of total variance explained.

SE Standard error of the estimate, with formula provided on pg. 973 of the article cited below.

singular Singluar value for the dimension.

Nrow Number of rows/stimuli.

Ncol Number of columns used in estimation. This may differ from the data set due to columns discarded due to the minscale constraint.

Ndata Total number of data entries.

Nmiss Number of missing entries.

SS_mean Sum of squares grand mean.

dims Number of dimensions estimated.

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Source

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See Also

'Issues1980', 'summary.blackbox', 'plot.blackbox'.

Examples

```
### Loads issue scales from the 1980 ANES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

summary(Issues1980_bb)
```

LC1980 *1980 Liberal-Conservative Scales.*

Description

Liberal-Conservative 7-point scales from the 1980 National Election Study. Includes (in order) self-placement, and rankings of Carter, Reagan, Kennedy, Anderson, Republican party, Democratic Party. Stored as a matrix of integers. The numbers 0, 8, and 9 are considered to be missing values.

Usage

```
data(LC1980)
```

Value

The data is formatted as an integer matrix with the following elements.

`LC1980` matrix, containing reported placements of various stimuli on a 7 point Liberal-Conservative scale:

- `Self` Self-placement on 7 point scale.
- `Carter` Placement of Carter on 7 point scale.
- `Reagan` Placement of Reagan on 7 point scale.
- `Kennedy` Placement of Kennedy on 7 point scale.
- `Anderson` Placement of Anderson on 7 point scale.
- `Republicans` Placement of Republicans on 7 point scale.
- `Democrats` Placement of Democrats on 7 point scale.

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Source

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'summary.aldmck', 'plot.aldmck', 'plot.cdf'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)

result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)
plot(result)
```

LC1980_bbt *Blackbox Transpose Estimate, 1980 Liberal-Conservative Scales.*

Description

Blackbox-Transpose estimates from Liberal-Conservative 7-point scales from the 1980 National Election Study. Estimates in 3 dimensions.

Usage

```
data(LC1980_bbt)
```

Value

An object of class `blackbt`.

`stimuli` vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Each row contains data on a separate stimulus, and each data frame includes the following variables:

- `N` Number of respondents who ranked this stimulus.
- `coord1D` Location of the stimulus in the first dimension. If viewing the results for a higher dimension, higher dimension results will appear as coord2D, coord3D, etc.
- `R2` The percent variance explained for the stimulus. This increases as more dimensions are estimated.

`individuals` vector of data frames of length dims. Each data frame presents results for estimates from that dimension (i.e. x$stimuli[[2]] presents results for dimension 2). Individuals that are discarded from analysis due to the minscale constraint are NA'd out. Each row contains data on a separate stimulus, and each data frame includes the following variables:

- `c` Estimate of the individual intercept.
- `w1` Estimate of the individual slope. If viewing the results for a higher dimension, higher dimension results will appear as w2, w3, etc.
- `R2` The percent variance explained for the respondent. This increases as more dimensions are estimated.

`fits` A data frame of fit results, with elements listed as follows:

`SSE` Sum of squared errors.

`SSE.explained` Explained sum of squared error.

`percent` Percentage of total variance explained.

`SE` Standard error of the estimate, with formula provided in the article cited below.

`singular` Singluar value for the dimension.

`Nrow` Number of rows/stimuli.

Ncol	Number of columns used in estimation. This may differ from the data set due to columns discarded due to the minscale constraint.
Ndata	Total number of data entries.
Nmiss	Number of missing entries.
SS_mean	Sum of squares grand mean.
dims	Number of dimensions estimated.

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See Also

'plotcdf.blackbt', 'LC1980', 'plot.blackbt', 'summary.blackbt', 'blackbox_transpose'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements


LC1980_bbt <- blackbox_transpose(LCdat, missing=c(0,8,9), dims=3,
  minscale=5, verbose=TRUE)

### 'LC1980_bbt' can be retrieved quickly with:
data(LC1980_bbt)
```

```
summary(LC1980_bbt)
plot(LC1980_bbt)
```

`plot.aldmck` *Aldrich-McKelvey Coordinate Distribution Plot*

Description

`plot.aldmck` reads an `aldmck` object and plots the probability distribution of the respondents and stimuli.

Usage

```
## S3 method for class 'aldmck'
plot(x, ...)
```

Arguments

`x`	an `aldmck` output object.
`...`	Other arguments to `plot`.

Value

A plot of the probability distribution of the respondent ideal points, along with the locations of the stimuli. If no self-placements were specified during estimation, no graphical plots will appear.

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

David A. Armstrong II, Ryan Bakker, Royce Carroll, Christopher Hare, Keith T. Poole, and Howard Rosenthal. 2021. *Analyzing Spatial Models of Choice and Judgment*. 2nd ed. Statistics in the Social and Behavioral Sciences Series. Boca Raton, FL: Chapman & Hall/CRC. doi: 10.1201/9781315197609

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980', 'summary.aldmck', 'plot.AM', 'plot.cdf' 'plot.aldmck_negative','plot.aldmck_positive'.

Examples

```
### Loads and scales the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)

result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)
plot(result)
```

---

plot.aldmck_negative *Aldrich-McKelvey Negative Coordinate Distribution Plot*

Description

`plot.aldmck_negative` reads an `aldmck` object and plots the probability distribution of the respondents and stimuli with negative weights.

Usage

```
## S3 method for class 'aldmck_negative'
plot(x, xlim=c(-2,2), ...)
```

Arguments

`x`	an `aldmck` output object.
`xlim`	vector of length 2, fed to the `plot` function as the `xlim` argument, which sets the minimum and maximum range of the x-axis.
`...`	other arguments to `plot`.

Value

A plot of the probability distribution of the respondent ideal points, along with the locations of the stimuli. If no negative weights exist, either because respondent self-placements are not specified, or because all weights are positive, a plot indicating this in text is given.

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980', 'summary.aldmck', 'plot.cdf', 'plot.aldmck'

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)

plot.aldmck_negative(result, xlim=c(-1.5,1.5))
```

---

plot.aldmck_positive *Aldrich-McKelvey Positive Coordinate Distribution Plot*

Description

plot.aldmck_positive reads an aldmck object and plots the probability distribution of the respondents and stimuli with positive weights.

Usage

```
## S3 method for class 'aldmck_positive'
plot(x, xlim=c(-2,2), ...)
```

Arguments

x	an aldmck output object.
xlim	vector of length 2, fed to the plot function as the xlim argument, which sets the minimum and maximum range of the x-axis.
...	other arguments to plot.

Value

A plot of the probability distribution of the respondent ideal points, along with the locations of the stimuli. If no weights exist because respondent self-placements are not specified, a plot indicating this in text is given.

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980', 'summary.aldmck', 'plot.cdf', 'plot.aldmck'

Examples

```
### Loads and scales the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)

plot.aldmck_positive(result,xlim=c(-1.5,1.5))
```

`plot.AM` *Aldrich-McKelvey Coordinate Distribution Plot*

Description

`plot.AM` reads an `aldmck` object and plots the probability distribution of the respondents and stimuli.

Usage

```
## S3 method for class 'AM'
plot(x, xlim=c(-2,2), ...)
```

Arguments

`x`	an `aldmck` output object.
`xlim`	vector of length 2, fed to the `plot` function as the `xlim` argument, which sets the minimum and maximum range of the x-axis.
`...`	other arguments to `plot`.

Value

A plot of the probability distribution of the respondent ideal points, along with the locations of the stimuli. If no self-placements were specified during estimation, no graphical plots will appear.

Author(s)

Keith Poole <ktpoole@uga.edu>

Howard Rosenthal <hr31@nyu.edu>

Jeffrey Lewis <jblewis@ucla.edu>

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

David A. Armstrong II, Ryan Bakker, Royce Carroll, Christopher Hare, Keith T. Poole, and Howard Rosenthal. 2021. *Analyzing Spatial Models of Choice and Judgment*. 2nd ed. Statistics in the Social and Behavioral Sciences Series. Boca Raton, FL: Chapman & Hall/CRC. doi: 10.1201/9781315197609

Thomas R. Palfrey and Keith T. Poole. 1987. "The Relationship between Information, Ideology, and Voting Behavior." *American Journal of Political Science* 31(3): 511-530. doi: 10.2307/2111281

Keith T. Poole, Jeffrey B. Lewis, Howard Rosenthal, James Lo, and Royce Carroll. 2016. "Recovering a Basic Space from Issue Scales in R." *Journal of Statistical Software* 69(7): 1-21. doi:10.18637/jss.v069.i07

Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980', 'summary.aldmck', 'plot.cdf', 'plot.aldmck'

Examples

```
### Loads and scales the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)

plot.AM(result, xlim=c(-1.5,1.5))
```

---

plot.blackbox *Blackbox Coordinate Distribution Plot*

Description

plot.blackbox reads an blackbox object and plots a histogram of the estimated intercepts.

Usage

```
## S3 method for class 'blackbox'
plot(x, ...)
```

Arguments

x	an blackbox output object.
...	other arguments to hist.

Value

A histogram of the estimated intercepts.

Author(s)

Keith Poole <ktpoole@uga.edu>

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Jeffrey Lewis <jblewis@ucla.edu>

James Lo <lojames@usc.edu>

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'Issues1980', 'summary.blackbox', 'plot.blackbox'.

Examples

```
### Loads issue scales from the 1980 ANES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

summary(Issues1980_bb)
plot(Issues1980_bb)
```

plot.blackbt *Blackbox Transpose Coordinate Distribution Plot*

Description

plot.blackbt reads an blackbt object and plots the probability distribution of the respondents and stimuli.

Usage

```
## S3 method for class 'blackbt'
plot(x, xlim=c(-1,1), ...)
```

Arguments

x	an blackbt output object.
xlim	vector of length 2, fed to the plot function as the xlim argument, which sets the minimum and maximum range of the x-axis.
...	other arguments to plot.

Value

A plot of the probability distribution of the respondent ideal points, along with the locations of the stimuli.

Author(s)

Keith Poole <ktpoole@uga.edu>

Howard Rosenthal <hr31@nyu.edu>

Jeffrey Lewis <jblewis@ucla.edu>

James Lo <lojames@usc.edu>

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox_transpose', 'LC1980', 'plotcdf.blackbt', 'summary.blackbt', 'LC1980_bbt'.

Examples

```
### Loads and scales the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements


LC1980_bbt <- blackbox_transpose(LCdat, missing=c(0,8,9), dims=3,
  minscale=5, verbose=TRUE)

### 'LC1980_bbt' can be retrieved quickly with:
data(LC1980_bbt)

summary(LC1980_bbt)
plot(LC1980_bbt)
```

---

plot.boot_aldmck *Bootstrapped Aldrich-McKelvey Stimulus Plots*

Description

plot.boot_aldmck reads an boot_aldmck object and plots a dotchart of the stimuli with estimated confidence intervals.

Usage

```
## S3 method for class 'boot_aldmck'
plot(x, ...)
```

Arguments

x	an boot_aldmck output object.
...	other arguments to plot.

Value

A dotchart of estimated stimulus locations, with 95 percent confidence intervals. Point estimates are estimates from the original data set.

Author(s)

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Jeffrey Lewis <jblewis@ucla.edu>

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'boot_aldmck'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
result <- boot_aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), iter=30)

plot(result)
```

---

plot.boot_blackbt *Bootstrapped Blackbox Transpose Stimulus Plots*

Description

plot.boot_blackbt reads an boot_blackbt object and plots a dotchart of the stimuli with estimated confidence intervals.

Usage

```
## S3 method for class 'boot_blackbt'
plot(x, ...)
```

Arguments

x	an boot_blackbt output object.
...	other arguments to plot.

Value

A dotchart of estimated stimulus locations, with 95 percent confidence intervals. Point estimates are estimates from the original data set.

Author(s)

Keith Poole <ktpoole@uga.edu>

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Jeffrey Lewis <jblewis@ucla.edu>

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox_transpose', 'boot_blackbt'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
data <- LC1980[,-1] #Dump the column of self-placements


bootbbt <- boot_blackbt(data, missing=c(0,8,9), dims=1,
  minscale=8, iter=10)

### 'bootbbt' can be retrieved quickly with:
data(bootbbt)

plot.boot_blackbt(bootbbt)
```

plot.cdf *Aldrich-McKelvey Coordinate Cumulative Distribution Plot*

Description

plot.aldmck reads an aldmck object and plots the cumulative distribution of the respondents and stimuli.

Usage

```
## S3 method for class 'cdf'
plot(x, align=NULL, xlim=c(-2,2), ...)
```

Arguments

x	an aldmck output object.
align	integer, the x-axis location that stimuli names should be aligned to If set to NULL, it will attempt to guess a location.
xlim	vector of length 2, fed to the plot function as the xlim argument, which sets the minimum and maximum range of the x-axis.
...	other arguments to plot.

Value

A plot of the empirical cumulative distribution of the respondent ideal points, along with the locations of the stimuli. If no self-placements were specified during estimation, no graphical plots will appear.

Author(s)

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

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Keith T. Poole, Jeffrey B. Lewis, Howard Rosenthal, James Lo, and Royce Carroll. 2016. "Recovering a Basic Space from Issue Scales in R." *Journal of Statistical Software* 69(7): 1-21. doi:10.18637/jss.v069.i07

Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980', 'summary.aldmck', 'plot.aldmck'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)

plot.cdf(result)
```

---

plotcdf.blackbt *Blackbox Transpose Coordinate Cumulative Distribution Plot*

Description

`plotcdf.blackbt` reads an `blackbt` object and plots the cumulative distribution of the respondents and stimuli.

Usage

```
plotcdf.blackbt(x, align=NULL, xlim=c(-1.2,1), ...)
```

Arguments

`x`	an `blackbt` output object.
`align`	integer, the x-axis location that stimuli names should be aligned to If set to NULL, it will attempt to guess a location.
`xlim`	vector of length 2, fed to the `plot` function as the `xlim` argument, which sets the minimum and maximum range of the x-axis.
`...`	other arguments to `plot`.

Value

A plot of the empirical cumulative distribution of the respondent ideal points, along with the locations of the stimuli.

Author(s)

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Jeffrey Lewis <jblewis@ucla.edu>

James Lo <lojames@usc.edu>

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Christopher Hare <cdhare@ucdavis.edu>

References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox_transpose', 'LC1980', 'plot.blackbt', 'summary.blackbt', 'LC1980_bbt'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements


LC1980_bbt <- blackbox_transpose(LCdat, missing=c(0,8,9), dims=3,
  minscale=5, verbose=TRUE)

### 'LC1980_bbt' can be retrieved quickly with:
data(LC1980_bbt)
summary(LC1980_bbt)

plotcdf.blackbt(LC1980_bbt)
```

---

predict.aldmck *Predict method of aldmck objects*

Description

`predict.aldmck` reads an `aldmck` object and uses the estimates to generate a matrix of predicted values.

Usage

```
  ## S3 method for class 'aldmck'
predict(object, caliper=0.2, ...)
```

Arguments

object	A aldmck output object.
caliper	Caliper tolerance. Any individuals with estimated weights lower than this value are NA'd out for prediction. Since predictions are made by dividing observed values by estimating weights, very small weights will grossly inflate the magnitude of predicted values and lead to extreme predictions.
...	Ignored.

Value

A matrix of predicted values generated from the parameters estimated from a aldmck object.

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Christopher Hare <cdhare@ucdavis.edu>

References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

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Thomas R. Palfrey and Keith T. Poole. 1987. "The Relationship between Information, Ideology, and Voting Behavior." *American Journal of Political Science* 31(3): 511-530. doi: 10.2307/2111281

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980'

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)

### Estimate an aldmck object from example and call predict function
result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)
prediction <- predict.aldmck(result)

### Examine predicted vs. observed values for first 10 respondents
### Note some observations are NA'd in prediction matrix from caliper
### First column of LC1980 are self-placements, which are excluded
LC1980[1:10,-1]
prediction[1:10,]

### Check correlation across all predicted vs. observed, excluding missing values
prediction[which(LC1980[,-1] %in% c(0,8,9))] <- NA
cor(as.numeric(prediction), as.numeric(LC1980[,-1]), use="pairwise.complete")
```

---

predict.blackbox *Predict method of blackbox objects*

Description

predict.blackbox reads an blackbox object and uses the estimates to generate a matrix of predicted values.

Usage

```
  ## S3 method for class 'blackbox'
predict(object, dims=1, ...)
```

Arguments

object	A blackbox output object.
dims	Number of dimensions used in prediction. Must be equal to or less than number of dimensions used in estimation.
...	Ignored.

Value

A matrix of predicted values generated from the parameters estimated from a blackbox object.

Author(s)

Keith Poole <ktpoole@uga.edu>

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Jeffrey Lewis <jblewis@ucla.edu>

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References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox', 'Issues1980'

Examples

```
### Loads issue scales from the 1980 ANES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode

### Estimate blackbox object from example and call predict function

Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)
prediction <- predict.blackbox(Issues1980_bb, dims=3)

### Examine predicted vs. observed values for first 10 respondents
### Note that 4th and 6th respondents are NA because of missing data
Issues1980[1:10,]
prediction[1:10,]

### Check correlation across all predicted vs. observed, excluding missing values
prediction[which(Issues1980 %in% c(0,8,9))] <- NA
cor(as.numeric(prediction), as.numeric(Issues1980), use="pairwise.complete")
```

predict.blackbt *Predict method of blackbt objects*

Description

predict.blackbt reads an blackbt object and uses the estimates to generate a matrix of predicted values.

Usage

```
  ## S3 method for class 'blackbt'
predict(object, dims=1, ...)
```

Arguments

object	A blackbox output object.
dims	Number of dimensions used in prediction. Must be equal to or less than number of dimensions used in estimation.
...	Ignored.

Value

A matrix of predicted values generated from the parameters estimated from a blackbt object.

Author(s)

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Christopher Hare <cdhare@ucdavis.edu>

References

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Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox_transpose', 'LC1980', 'LC1980_bbt'

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] #Dump the column of self-placements

### Estimate blackbt object from example and call predict function

LC1980_bbt <- blackbox_transpose(LCdat, missing=c(0,8,9), dims=3,
  minscale=5, verbose=TRUE)

### 'LC1980_bbt' can be retrieved quickly with:
data(LC1980_bbt)
prediction <- predict.blackbt(LC1980_bbt, dims=2)

### Examine predicted vs. observed values for first 10 respondents
### First column of LC1980 are self-placements, which are excluded
LC1980[1:10,-1]
prediction[1:10,]

### Check correlation across all predicted vs. observed, excluding missing values
prediction[which(LC1980[,-1] %in% c(0,8,9))] <- NA
cor(as.numeric(prediction), as.numeric(LC1980[,-1]), use="pairwise.complete")
```

---

stimuli *Stimulus extraction function*

Description

`stimuli` is a convenience function to extract the stimulus parameters from an `aldmck`, `blackbox`, or `blackbt` object.

Usage

```
stimuli(object)
```

Arguments

`object`	an `aldmck`, `blackbox`, or `blackbt` output object.

Value

The stimuli of the estimated output, which can also be recovered as `object\$stimuli`. Please refer to the documentation of `aldmck`, `blackbox`, or `blackbox_transpose` for specifics.

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

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Keith T. Poole, Jeffrey B. Lewis, Howard Rosenthal, James Lo, and Royce Carroll. 2016. "Recovering a Basic Space from Issue Scales in R." *Journal of Statistical Software* 69(7): 1-21. doi:10.18637/jss.v069.i07

Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'blackbox', 'blackbox_transpose'.

Examples

```
### Loads issue scales from the 1980 ANES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

summary(Issues1980_bb)
stimuli(Issues1980_bb)
```

summary.aldmck *Aldrich-McKelvey Summary*

Description

summary.aldmck reads an aldmck object and prints a summary.

Usage

```
## S3 method for class 'aldmck'
summary(object, ...)
```

Arguments

object	an aldmck output object.
...	further arguments to print.

Value

A summary of an aldmck object. Reports number of stimuli, respondents scaled, number of respondents with positive and negative weights, R-squared, Reudction of normalized variance of perceptions, and stimuli locations.

Author(s)

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References

John H. Aldrich and Richard D. McKelvey. 1977. "A Method of Scaling with Applications to the 1968 and 1972 Presidential Elections." *American Political Science Review* 71(1): 111-130. doi: 10.2307/1956957

David A. Armstrong II, Ryan Bakker, Royce Carroll, Christopher Hare, Keith T. Poole, and Howard Rosenthal. 2021. *Analyzing Spatial Models of Choice and Judgment*. 2nd ed. Statistics in the Social and Behavioral Sciences Series. Boca Raton, FL: Chapman & Hall/CRC. doi: 10.1201/9781315197609

Thomas R. Palfrey and Keith T. Poole. 1987. "The Relationship between Information, Ideology, and Voting Behavior." *American Journal of Political Science* 31(3): 511-530. doi: 10.2307/2111281

Keith T. Poole, Jeffrey B. Lewis, Howard Rosenthal, James Lo, and Royce Carroll. 2016. "Recovering a Basic Space from Issue Scales in R." *Journal of Statistical Software* 69(7): 1-21. doi:10.18637/jss.v069.i07

Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'aldmck', 'LC1980', 'plot.aldmck', 'plot.cdf'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)

result <- aldmck(data=LC1980, polarity=2, respondent=1, missing=c(0,8,9), verbose=TRUE)

summary(result)
plot.aldmck(result)
```

`summary.blackbox` *Blackbox Summary*

Description

`summary.blackbox` reads an `blackbox` object and prints a summary.

Usage

```
  ## S3 method for class 'blackbox'
summary(object, ...)
```

Arguments

`object`	a `blackbox` output object.
`...`	further arguments to `print`.

Value

A summary of a `blackbox` object. For each dimension, reports all stimuli with coordinates, individuals used for scaling, and fit. Also summarizes number of rows, columns, total data entries, number of missing entries, percent missing data, and sum of squares.

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References

David A. Armstrong II, Ryan Bakker, Royce Carroll, Christopher Hare, Keith T. Poole, and Howard Rosenthal. 2021. *Analyzing Spatial Models of Choice and Judgment*. 2nd ed. Statistics in the Social and Behavioral Sciences Series. Boca Raton, FL: Chapman & Hall/CRC. doi: 10.1201/9781315197609

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See Also

'blackbox', 'Issues1980'

Examples

```
### Loads issue scales from the 1980 ANES.
data(Issues1980)
Issues1980[Issues1980[,"abortion1"]==7,"abortion1"] <- 8 #missing recode
Issues1980[Issues1980[,"abortion2"]==7,"abortion2"] <- 8 #missing recode


Issues1980_bb <- blackbox(Issues1980, missing=c(0,8,9), verbose=FALSE,
  dims=3, minscale=8)

### 'Issues1980_bb' can be retrieved quickly with:
data(Issues1980_bb)

summary(Issues1980_bb)
```

`summary.blackbt` *Blackbox-Transpose Summary*

Description

`summary.blackbt` reads an `blackbt` object and prints a summary.

Usage

```
  ## S3 method for class 'blackbt'
summary(object, ...)
```

Arguments

`object`	a `blackbt` output object.
`...`	further arguments to `print`.

Value

A summary of a `blackbt` object. For each dimension, reports all stimuli with coordinates, individuals used for scaling, and fit. Also summarizes number of rows, columns, total data entries, number of missing entries, percent missing data, and sum of squares.

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References

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Keith T. Poole, Jeffrey B. Lewis, Howard Rosenthal, James Lo, and Royce Carroll. 2016. "Recovering a Basic Space from Issue Scales in R." *Journal of Statistical Software* 69(7): 1-21. doi:10.18637/jss.v069.i07

Keith T. Poole. 1998. "Recovering a Basic Space From a Set of Issue Scales." *American Journal of Political Science* 42(3): 954-993. doi: 10.2307/2991737

See Also

'blackbox_transpose', 'LC1980', 'plot.blackbt', 'plotcdf.blackbt', 'LC1980_bbt'.

Examples

```
### Loads the Liberal-Conservative scales from the 1980 ANES.
data(LC1980)
LCdat <- LC1980[,-1] # Dump the column of self-placements


LC1980_bbt <- blackbox_transpose(LCdat, missing=c(0,8,9), dims=3,
  minscale=5, verbose=TRUE)

### 'LC1980_bbt' can be retrieved quickly with:
data(LC1980_bbt)

summary(LC1980_bbt)
plot(LC1980_bbt)
```

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