

Package ‘anominate’

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Description Fits ideal point model described in Carroll, Lewis, Lo, Poole and Rosenthal (2013), “The Structure of Utility in Models of Spatial Voting,” *American Journal of Political Science* 57(4): 1008--1028, <doi:10.1111/ajps.12029>.

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anominate-package *alpha-NOMINATE*

Description

Fits ideal point model described in Carroll, Lewis, Lo, Poole and Rosenthal, "The Structure of Utility in Models of Spatial Voting," *American Journal of Political Science* 57(4): 1008–1028.

Details

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Author(s)

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References

Carroll, Lewis, Lo, Poole and Rosenthal, "The Structure of Utility in Models of Spatial Voting," *American Journal of Political Science* 57(4): 1008–1028.

See Also

wnominate

anominate *alpha-NOMINATE: Ideal Point Estimator*

Description

Fits the Bayesian (MCMC-based) version of Poole and Rosenthal's NOMINATE model described in Carroll, Lewis, Lo, Poole and Rosenthal, "The Structure of Utility in Spatial Models of Voting," *American Journal of Political Science* 57(4): 1008–1028. The method estimates the structure of political actors' utility functions from roll call data with the inclusion of a separate parameter denoted as alpha. alpha values of 1 indicate normal (Gaussian) utility, while alpha values of 0 indicate quadratic utility.

Usage

```
anominate(rcObject, dims=1, nsamp=1000, thin=1, burnin=500, minvotes=20,
lop=0.025, polarity=1, random.starts=TRUE, verbose=FALSE, constrain=FALSE)
```

Arguments

<code>rcObject</code>	An roll call matrix of class <code>rollcall</code> , from Simon Jackman's <code>pscl</code> package
<code>dims</code>	Number of dimensions to estimate
<code>nsamp</code>	Total number of iterations for the sampler. <code>nsamp</code> divided by <code>thin</code> must be larger than <code>burnin</code> .
<code>thin</code>	Thinning interval
<code>burnin</code>	Number of iterations to be discarded
<code>minvotes</code>	Minimum number of votes required for a legislator to be included in the analysis
<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 percent
<code>polarity</code>	A vector specifying the row number of the legislator(s) constrained to have a positive (i.e., right-wing or conservative) score on each dimension
<code>random.starts</code>	If <code>TRUE</code> , initial values for the legislator and bill parameters are randomly drawn from a uniform distribution. If <code>FALSE</code> , the <code>W-NOMINATE</code> estimates are used as the initial values
<code>verbose</code>	If <code>TRUE</code> , the progress of the sampler at each 100th iteration is printed to the screen
<code>constrain</code>	If <code>TRUE</code> , this constrains <code>alpha=1</code> and does not estimate it. This option should be used if more than one dimension is being estimated, which makes the method equivalent to a Bayesian implementation of Poole and Rosenthal's (1997) <code>NOMINATE</code> model.

Value

A list with the following elements:

<code>alpha</code>	An object of class <code>mcmc</code> with the sampled values of the alpha parameter
<code>beta</code>	An object of class <code>mcmc</code> with the sampled values of the beta parameter
<code>legislators</code>	A object of class <code>mcmc</code> with the sampled values of the legislator ideal points, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>legislators[[1]]</code> , the second dimension coordinates in <code>legislators[[2]]</code> , etc.)
<code>yea.locations</code>	A object of class <code>mcmc</code> with the sampled values of the Yea locations (midpoint - spread in <code>W-NOMINATE</code>) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>yea.locations[[1]]</code> , the second dimension coordinates in <code>yea.locations[[2]]</code> , etc.)
<code>nay.locations</code>	A object of class <code>mcmc</code> with the sampled values of the Nay locations (midpoint + spread in <code>W-NOMINATE</code>) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>nay.locations[[1]]</code> , the second dimension coordinates in <code>nay.locations[[2]]</code> , etc.)

wnom.result An object of class nomObject with the W-NOMINATE results

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. “The Structure of Utility in Spatial Models of Voting.” *American Journal of Political Science* 57(4): 1008–1028.

Poole, Keith T. and Howard Rosenthal. 1997. *Congress: A Political-Economic History of Roll Call Voting*. New York: Oxford University Press.

See Also

[summary.anominate](#), [plot.anominate](#), [densplot.anominate](#), [traceplot.anominate](#).

Examples

```
## Not run:
data(sen111)
sen111_anom <- anominate(sen111, dims=1, polarity=2, nsamp=200, thin=1,
burnin=100, random.starts=FALSE, verbose=TRUE)
summary(sen111_anom)
## Graphical summaries
plot(sen111_anom)
densplot.anominate(sen111_anom)
traceplot.anominate(sen111_anom)

## End(Not run)
```

anominate.sim

alpha-NOMINATE Estimation on Simulated Roll Call Matrices Generated with Normal (Gaussian) or Quadratic Utility

Description

Generates a matrix of roll call votes based on the assumption that legislators possess either normal (Gaussian) or quadratic utility functions. The roll call votes are then analyzed using the ideal point model described in Carroll, Lewis, Lo, Poole and Rosenthal, “The Structure of Utility in Spatial Models of Voting,” *American Journal of Political Science* 57(4): 1008–1028. The estimated value of the alpha parameter can be compared to the true value (1 for normal (Gaussian) utility, 0 for quadratic utility).

Usage

```
anominate.sim(nvotes=500, nlegis=101, seed=123345, utility="normal")
```

Arguments

<code>nvotes</code>	Number of roll call votes to be simulated
<code>nlegis</code>	Number of legislators to be simulated
<code>seed</code>	Seed for the random number generator
<code>utility</code>	The utility function used to generate the roll call data (“normal” or “quadratic”)

Value

An object of class `rollcall`, a list with the following components:

<code>votes</code>	a matrix containing voting decisions, with rows corresponding to legislators (test subjects) and columns to roll call votes (test items). Legislators (test subjects) and items (or votes) have been labeled in the <code>dimnames</code> attribute of this matrix, using the <code>legis.names</code> and/or <code>vote.names</code> arguments, respectively.
<code>codes</code>	a list with named components <code>yea</code> , <code>nay</code> , <code>notInLegis</code> and <code>missing</code> , each component a numeric vector (possibly of length 1 and possibly NA), indicating how entries in the <code>votes</code> component of the <code>rollcall</code> object should be considered. This list simply gathers up the values in the <code>yea</code> , <code>nay</code> , <code>notInLegis</code> and <code>missing</code> arguments passed to the function.
<code>n</code>	numeric, number of legislators, equal to <code>dim(votes)[1]</code>
<code>m</code>	numeric, number of votes, equal to <code>dim(votes)[2]</code>
<code>legis.data</code>	user-supplied data on legislators/test-subjects.
<code>vote.data</code>	user-supplied data on rollcall votes/test-items.
<code>desc</code>	any user-supplied description. If no description was provided, defaults <code>desc</code> defaults to <code>NULL</code> .
<code>source</code>	any user-supplied source information (e.g., a url or a short-form reference). If no description is provided, <code>source</code> defaults to <code>NULL</code> .

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. “The Structure of Utility in Spatial Models of Voting.” *American Journal of Political Science* 57(4): 1008–1028.

See Also

[rollcall](#) for the full documentation of a roll call object from Simon Jackman’s `pscl` package.

Output from this function is intended for use with `anominate`.

Examples

```
## Not run:
quadratic.data <- anominate.sim(utility="quadratic")
quad_anom <- anominate(quadratic.data, dims=1, polarity=2, nsamp=200, thin=1,
burnin=100, random.starts=FALSE, verbose=TRUE)
summary(quad_anom)

normal.data <- anominate.sim(utility="normal")
norm_anom <- anominate(normal.data, dims=1, polarity=2, nsamp=200, thin=1,
burnin=100, random.starts=FALSE, verbose=TRUE)
summary(norm_anom)

## End(Not run)
```

densplot.anominate *alpha-NOMINATE Density Plot Function*

Description

`densplot.anominate` reads a `anominate` object and plots the density of the alpha parameter using the `densplot` function in `coda`.

Usage

```
densplot.anominate(x, ...)
```

Arguments

`x` output of class `anominate`, generated as output from function `anominate`.
`...` other arguments to `densplot`

Value

A density plot of alpha.

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

[summary.anominate](#), [anominate](#), [plot.anominate](#), [traceplot.anominate](#).

Examples

```
data(sen111)
data(sen111_anom)

densplot.anominate(sen111_anom)
```

norm_anom	<i>alpha-NOMINATE Estimate, Simulated Roll Call Matrix using Normal Utility</i>
-----------	---

Description

alpha-NOMINATE estimates from simulated roll call matrix using normal utility. Estimates in one dimension.

Usage

```
data(norm_anom)
```

Value

An object of class `anominate`, a list with the following elements:

<code>alpha</code>	An object of class <code>mcmc</code> with the sampled values of the alpha parameter
<code>beta</code>	An object of class <code>mcmc</code> with the sampled values of the beta parameter
<code>legislators</code>	A object of class <code>mcmc</code> with the sampled values of the legislator ideal points, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>legislators[[1]]</code> , the second dimension coordinates in <code>legislators[[2]]</code> , etc.)
<code>yea.locations</code>	A object of class <code>mcmc</code> with the sampled values of the Yea locations (midpoint - spread in W-NOMINATE) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>yea.locations[[1]]</code> , the second dimension coordinates in <code>yea.locations[[2]]</code> , etc.)
<code>nay.locations</code>	A object of class <code>mcmc</code> with the sampled values of the Nay locations (midpoint + spread in W-NOMINATE) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>nay.locations[[1]]</code> , the second dimension coordinates in <code>nay.locations[[2]]</code> , etc.)
<code>wnom.result</code>	An object of class <code>nomObject</code> with the W-NOMINATE results

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

'anominate.sim', 'anominate', 'summary.anominate', 'plot.anominate', 'densplot.anominate', 'traceplot.anominate'.

Examples

```
## Not run:
normal.data <- anominate.sim(utility="normal")
norm_anom <- anominate(normal.data, dims=1, polarity=2, nsamp=200, thin=1,
burnin=100, random.starts=FALSE, verbose=TRUE)
summary(norm_anom)

## End(Not run)
```

plot.anominate

alpha-NOMINATE Coordinate Plot Function

Description

plot.anominate reads a anominate object and plots the estimated ideal points.

Usage

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

Arguments

x output of class anominate, generated as output from function anominate.
... other arguments to plot

Value

A coordinate plot, with 95% credible interval bars.

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

'[summary.anominate](#)','[anominate](#)','[densplot.anominate](#)','[traceplot.anominate](#)'.

Examples

```
data(sen111_anom)
plot(sen111_anom)
```

quad_anom	<i>alpha-NOMINATE Estimate, Simulated Roll Call Matrix using Quadratic Utility</i>
-----------	--

Description

alpha-NOMINATE estimates from simulated roll call matrix using quadratic utility. Estimates in one dimension.

Usage

```
data(quad_anom)
```

Value

An object of class `anominate`, a list with the following elements:

<code>alpha</code>	An object of class <code>mcmc</code> with the sampled values of the alpha parameter
<code>beta</code>	An object of class <code>mcmc</code> with the sampled values of the beta parameter
<code>legislators</code>	A object of class <code>mcmc</code> with the sampled values of the legislator ideal points, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>legislators[[1]]</code> , the second dimension coordinates in <code>legislators[[2]]</code> , etc.)
<code>yea.locations</code>	A object of class <code>mcmc</code> with the sampled values of the Yea locations (midpoint - spread in W-NOMINATE) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>yea.locations[[1]]</code> , the second dimension coordinates in <code>yea.locations[[2]]</code> , etc.)

`nay.locations` A object of class `mcmc` with the sampled values of the Nay locations (midpoint + spread in W-NOMINATE) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in `nay.locations[[1]]`, the second dimension coordinates in `nay.locations[[2]]`, etc.)

`wnom.result` An object of class `nomObject` with the W-NOMINATE results

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

['anominate.sim'](#), ['linkanominate'](#), ['summary.anominate'](#), ['plot.anominate'](#), ['densplot.anominate'](#), ['traceplot.anominate'](#).

Examples

```
## Not run:
quadratic.data <- anominate.sim(utility="quadratic")
quad_anom <- anominate(quadratic.data, dims=1, polarity=2, nsamp=200, thin=1,
burnin=100, random.starts=FALSE, verbose=TRUE)
summary(quad_anom)

## End(Not run)
```

sen111

111th U.S. Senate Roll Call Vote Matrix

Description

This dataframe contains a matrix of votes cast by U.S. Senators in the 111th Congress. The data are formatted consistent with the `rollcall` object format in Simon Jackman's `pscl` package.

Usage

```
data(sen111)
```

Value

The dataframe contains roll call data for all Senators in the 111th 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: <ul style="list-style-type: none"> • <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: <ul style="list-style-type: none"> • <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.

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

Source

Keith Poole. 2014. *111th Senate Roll Call Vote Data*. <http://www.k7moa.com/>.

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

`'summary.anominate'`, `'anominate'`, `'densplot.anominate'`, `'traceplot.anominate'`, `'plot.anominate'`.

Examples

```
data(sen111)
```

sen111_anom	<i>alpha-NOMINATE Estimate, 111th U.S. Senate Roll Call Vote Matrix</i>
-------------	---

Description

alpha-NOMINATE estimates from 111th U.S. Senate roll call vote matrix. Estimates in one dimension.

Usage

```
data(sen111_anom)
```

Value

An object of class `anominate`, a list with the following elements:

alpha	An object of class <code>mcmc</code> with the sampled values of the alpha parameter
beta	An object of class <code>mcmc</code> with the sampled values of the beta parameter
legislators	A object of class <code>mcmc</code> with the sampled values of the legislator ideal points, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>legislators[[1]]</code> , the second dimension coordinates in <code>legislators[[2]]</code> , etc.)
yea.locations	A object of class <code>mcmc</code> with the sampled values of the Yea locations (midpoint - spread in W-NOMINATE) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>yea.locations[[1]]</code> , the second dimension coordinates in <code>yea.locations[[2]]</code> , etc.)
nay.locations	A object of class <code>mcmc</code> with the sampled values of the Nay locations (midpoint + spread in W-NOMINATE) for each vote, with each dimension stored in a separate list (e.g., the first dimension coordinates are stored in <code>nay.locations[[1]]</code> , the second dimension coordinates in <code>nay.locations[[2]]</code> , etc.)
wnom.result	An object of class <code>nomObject</code> with the W-NOMINATE results

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

['anominate'](#), ['summary.anominate'](#), ['plot.anominate'](#), ['densplot.anominate'](#), ['traceplot.anominate'](#).

Examples

```
data(sen111_anom)
```

summary.anominate	<i>alpha-NOMINATE Summary Function</i>
-------------------	--

Description

summary.anominate reads a anominate object and prints a summary.

Usage

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

Arguments

object	output of class anominate, generated as output from function anominate.
...	other arguments to print

Value

A summary of the estimate, with number of legislators, votes, dimensions, and summary of alpha estimate.

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. "The Structure of Utility in Spatial Models of Voting." *American Journal of Political Science* 57(4): 1008–1028.

See Also

['summary.anominate'](#), ['anominate'](#), ['densplot.anominate'](#), ['traceplot.anominate'](#).

Examples

```
data(sen111)
data(sen111_anom)

summary(sen111_anom)
```

traceplot.anominate *alpha-NOMINATE Traceplot Function*

Description

densplot.anominate reads a anominate object and plots a traceplot of the alpha parameter using the traceplot function in coda.

Usage

```
traceplot.anominate(x, ...)
```

Arguments

x output of class anominate, generated as output from function anominate.
... other arguments to traceplot

Value

A traceplot of alpha.

Author(s)

Christopher Hare, Royce Carroll, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal

References

Carroll, Royce, Jeffrey B. Lewis, James Lo, Keith T. Poole and Howard Rosenthal. 2013. “The Structure of Utility in Spatial Models of Voting.” *American Journal of Political Science* 57(4): 1008–1028.

See Also

[summary.anominate](#), [anominate](#), [plot.anominate](#), [traceplot.anominate](#).

Examples

```
data(sen111)
data(sen111_anom)

traceplot.anominate(sen111_anom)
```

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