Package 'cre'

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Title Constant Rate Effects

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Description Methods for detecting Constant Rate Effects in diachronic linguistic data under various models of the phenomenon.

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Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

URL https://github.com/hkauhanen/cre

R topics documented:

`fit.cre.nls` *Fit Constant Rate Effect Models (Nonlinear Least Squares)*

Description

Fit Constant (and Variable) Rate Effect models to data using a nonlinear least squares algorithm.

Usage

```
fit.cre.nls(data, format, contexts = NULL, model, budget = 100,
  warnOnly = FALSE)
```

Arguments

data	A data frame
format	One of "wide" or "long"; describes the format of the data frame.
contexts	A vector of names of contexts to use in fitting. By default (NULL), all contexts available in the data are used.
model	Model to fit: currently, one of "logistic", "bias" or "VRE" (see Details).
budget	Computational budget for fitting. Increasing the budget will improve goodness of fit but leads to longer runtimes. The default value of 100 is suitable in many cases, but the user is encouraged to experiment with the value.
warnOnly	Whether a warning only should be issued when fitting fails. If FALSE, the routine exits with an error upon failure to fit.

Details

It is possible to fit three kinds of models, controlled by the model argument: "logistic", the classical model of a family of logistic curves with identical slopes but potentially varying intercepts; "bias", the Kauhanen-Walkden production bias model; "VRE", a family of logistic curves with independent slopes and intercepts.

Value

Object of class "logistic", "bias" or "VRE", depending on the model specified; a list with the following elements:

data Data the model was fit on, in long format

parameters Model parameters

cumul_objfun_value Sum of squared residuals between model and data

cumul_objfun_value_normalized Sum of squared residuals divided by number of non-NA data points

N Number of non-NA data points

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frequentize *From Response to Frequency Data*

Description

Turn a response-based dataset into a frequency dataset.

Usage

```
frequentize(data)
```

Arguments

data	Data frame; must contain columns labelled "date", "context" and "response".

Value

A data frame.

`logistic` *Logistic Function*

Description

Generalized logistic function.

Usage

```
logistic(t, s = 1, k = 0, U = 1, L = 0)
```

Arguments

`t`	Variable (usually time, hence `t`)
`s`	Slope
`k`	Intercept
`U`	Upper asymptote
`L`	Lower asymptote

Value

Value of the function at `t`, given the parameters.

`prepare_data` *Prepare Data*

Description

Prepare data for use with the curve-fitting routines in `fit.cre.nls`.

Usage

```
prepare_data(data, format, contexts = NULL)
```

Arguments

`data`	A data frame (e.g. from `read.csv`)
`format`	Format of the data frame: either "wide" or "long"
`contexts`	Which contexts to use in fitting. By default (`NULL`), all contexts are used.

Details

Under normal circumstances, there is no need for the end user to call this function directly: it is called automatically by the `fit.cre.nls` routine. User-level access is provided for completeness and for debugging purposes.

Value

A data frame in a format `fit.cre.nls` understands.

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