

Package ‘panel’

February 15, 2012

Version 1.0.7

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Description Functions and datasets for fitting models to Panel data.

Title Panel

License GPL

Repository CRAN

Date/Publication 2010-04-13 07:21:46

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dclike.panel	<i>A function to compute the value of the log likelihood for a given set of panel data and a given value of the parameters.</i>
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Description

A fortran program is called to compute the value of the log likelihood.

Usage

```
dclike.panel(indata, ainv, amat, evalues, ncov, nstage)
```

Arguments

indata	indata is a list with one entry for each individual. Each entry is a structure with the components: time: the inspection times for that individual stage: the stage the individual is in at each inspection times cov: the value of the covariate for that individual at the inspection time len: the number of inspections for that individual
ainv	The inverse of the intensity matrix.
amat	The intensity matrix.
evalues	The eigenvalues.
ncov	The number of levels the covariate comes at.
nstage	nstage is the number of stages in the Markov model.

Value

The value of the log likelihood is returned.

Side Effects

There are no known side effects.

See Also

panel, eddcmp

eddcmp	<i>Eigenvalue–eigenvector decomposition.</i>
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Description

A function that produces an eigenvalue eigenvector decomposition of a transition intensity matrix for a Markov chain in double precision.

Usage

```
eddcmp(inmat)
```

Arguments

inmat	inmat is any square matrix describing the markov chain
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Value

A list with named components is returned.

eectors	a matrix containing the left eigenvectors
evalues	a vector containing the eigenvalues
im.evalues	a vector which contains the imaginary components of the eigenvalues if there are any (otherwise this is the zero vector).

COMMENTS

The matrix `inmat` is decomposed as `evecs %*% diag(evalues) %*% solve(evecs)`. For most matrices of interest the eigenvalues will all be real so the imaginary part is commonly ignored. The eigenvalues are ordered from smallest to largest.

kldata	<i>The data set given in Kalbfleisch and Lawless (1985).</i>
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Description

In Section 6 of Kalbfleisch and Lawless (1985) some data simulated from a three-state Markov model is given. They started 15 individuals in each of States 1 and 2 for each of four groups. Individuals were followed for 5 transitions at equidistant time intervals.

Usage

```
data(kldata)
```

Source

Kalbfleisch, J.D. and Lawless, J.F. 'The analysis of panel data under a Markov assumption', Journal of the American Statistical Association, 80, 863-871, (1985).

Examples

```
data(kldata)
##see the user's manual for explicit examples
```

panel	<i>A function to compute the maximum likelihood estimates of the transition parameters from panel data.</i>
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Description

The algorithm is discussed in Kalbfleisch and Lawless (1985) and further in Gentleman (1994).

Usage

```
panel(indata, qmatf, gamma, qderivf, npar, nstage, ncov, verbose = FALSE,
      tol = 0.001)
```

Arguments

<code>indata</code>	<code>indata</code> is a list with one element for each individual. Each element of <code>indata</code> is a structure with 4 components. <code>time</code> : a vector containing the inspection times <code>stage</code> : a vector containing the state of the individual at the corresponding inspection time <code>cov</code> : a vector containing the covariate values at the inspection times <code>len</code> : the number of inspections on that individual
<code>npar</code>	<code>npar</code> is the number of parameters that are to be estimated
<code>nstage</code>	<code>nstage</code> is the number of stages/states in the model
<code>ncov</code>	<code>ncov</code> is the number of levels the covariate comes at
<code>qmatf</code>	<code>qmatf</code> is a function that accepts as input <code>gamma</code> (the parameters) and returns an array (<code>ncov</code> x <code>nstage</code> x <code>nstage</code>) with the <code>ncov</code> transition intensity matrices.
<code>gamma</code>	<code>gamma</code> is a vector (<code>npar</code> long) of estimates of the transition parameters.
<code>qderivf</code>	<code>qderivf</code> is a function that takes <code>gamma</code> as an argument and returns an array (<code>npar</code> x <code>ncov</code> x <code>nstage</code> x <code>nstage</code>) with the derivatives of the transition intensity matrices with respect to each of the parameters.
<code>verbose</code>	If <code>verbose</code> is set to <code>TRUE</code> then on each iteration the current estimate of <code>theta</code> and the current value of the score function are printed out.
<code>tol</code>	The tolerance used to determine convergence.

Value

`panel` returns a list with the parameter estimates, their standard errors and the log likelihood on convergence.

Side Effects

There are no known side effects.

References

Kalbfleisch J. D. and Lawless J. F. "The Analysis of Panel Data Under a Markov Assumption", *JASA* (1985), p. 863. Gentleman R. (1994). The Use of Covariate Information in Multi-state Markov Models. Technical Report 13, Department of Statistics, University of Auckland.

See Also

`eddcmp`, `dclike.panel`

Examples

```
#See the accompanying document "A Users Guide to panel" for
#examples and code segments.
```

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