Package 'QICpack'

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Type Package

Title Model selection for generalized estimating equations using QIC

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Description This package contains the function 'qic', which calculates Pan's (2001) quasi likelihood information criteria (QIC) for models generated from the gee pack R package. The package also contains a function 'qictab'that compares a list of geeglm models from geepack and calculates delta QIC, QIC model weights, and cumulative model weights.

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URL http://github.com/djhocking/qicpack

Collate 'QICpack-internal.R' 'qic.R' 'qictab.R'

LazyLoad Yes

Depends MASS, geepack, stats

R topics documented:

QICpack-package *Model selection for generalized estimating equations using QIC*

Description

This package contains the function 'qic', which calculates Pan's (2001) quasi likelihood information criteria (QIC) for models generated from the gee pack R package. The package also contains a function 'qictab' that compares a list of geeglm models from geepack and calculates delta QIC, QIC model weights, and cumulative model weights.

Details

Package:	QICpack
Type:	Package
Version:	1.0
Date:	2012-12-10
License:	What license is it under?

~~ An overview of how to use the package, including the most important ~~ ~~ functions ~~

Author(s)

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References

Burnham, K. P. and D. R. Anderson. 2002. Model selection and multimodel inference: a practical information-theoretic approach. Second edition. Springer Science and Business Media, Inc., New York.

Hardin, J. W. and J. M. Hilbe. 2003. Generalized estimating equations. Chapman and Hall, New York.

Hojsgaard, S., U. Halekoh, and J. Yan. 2006. The R package geepack for generalized estimating equations. Journal of Statistical Software 15:1-11.

Pan, W. 2001. Akaike's information criterion in generalized estimating equations. Biometrics 57:120-125.

See Also

~~ Optional links to other man pages, e.g. ~~ ~~ <pkg> ~~

dietox — *dietox dataset from geepack*

Description

toxicity data

Usage

```
data(dietox)
```

Format

A data frame with 861 observations on the following 7 variables.

`Weight` a numeric vector

`Feed` a numeric vector

`Time` a numeric vector

`Pig` a numeric vector

`Evit` a numeric vector

`Cu` a numeric vector

`Litter` a numeric vector

Examples

```
data(dietox)
## maybe str(dietox) ; plot(dietox) ...
```

qic — *Calculates QIC (Pan 2001) for model generated using geeglm in geepack*

Description

This function calculates the quasilikelihood information criteria (QIC; Pan 2001) for model generated using geeglm in geepack. The QIC is intended as an equivalent of AIC for generalized estimating equations (GEE-PA).

Usage

```
qic(model.R)
```

Arguments

`model.R`	model.R is the fitted gee model from geeglm within geepack

Value

Returns QIC, log quasilikelihood, trace (eqivalent to K in AIC), px in a data frame

Author(s)

Daniel J. Hocking

References

Hardin, J. W. and J. M. Hilbe. 2003. Generalized estimating equations. Chapman and Hall, New York.

Pan, W. 2001. Akaike's information criterion in generalized estimating equations. Biometrics 57:120-125.

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==>  Define data, use random,
##--or do  help(data=index)  for the standard data sets.
data(dietox)
dietox$Cu <- as.factor(dietox$Cu)
mf <- formula(Weight ~ Cu * (Time + I(Time^2) + I(Time^3)))
gee1 <- geeglm(mf, data = dietox, id = Pig, family = gaussian, corstr = "ar1")
gee1
summary(gee1)
qic(gee1)
```

`qictab` *Calculates QIC (Pan 2001) for a list of fitted objects from geeglm within geepack and outputs a table relative model fits*

Description

Calculates QIC, delta QIC, QIC weights similiar to the aictab function within the AICcmodavg package. The function outputs a table of of the relative fit of each model in desending order.

Usage

```
qictab(cand.set, modnames, sort = TRUE)
```

Arguments

`cand.set`	A list of models (candidate set) fit using geeglm from geepack
`modnames`	Names of the models in the candidate set list
`sort`	If TRUE sorts the output table in desending order from best model to least supported

Value

Function returns a data table of model name, QIC, Log Quaislikelihood, Trace, px, delta QIC, QIC model weights, and cummulative model weight

Author(s)

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References

Pan, W. 2001. Akaike's information criterion in generalized estimating equations. Biometrics 57:120-125.

Burnham, K. P. and D. R. Anderson. 2002. Model selection and multimodel inference: a practical information-theoretic approach. Second edition. Springer Science and Business Media, Inc., New York.

Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==>  Define data, use random,
##--or do  help(data=index)  for the standard data sets.
library(geepack)

data(dietox)
dietox$Cu = as.factor(dietox$Cu)
mf = formula(Weight ~ Cu * (Time + I(Time^2) + I(Time^3)))
gee1 = geeglm(mf, data = dietox, id = Pig, family = gaussian, corstr = "ar1")

mf2 = formula(Weight ~ Cu * Time + I(Time^2) + I(Time^3))
gee2 = geeglm(mf2, data = dietox, id = Pig, family = gaussian, corstr = "ar1")

mf3 = formula(Weight ~ Cu + Time + I(Time^2))
gee3 = geeglm(mf3, data = dietox, id = Pig, family = gaussian, corstr = "ar1")
gee3.I = update(gee3, corstr = "independence")
gee3.Ex = update(gee3, corstr = "exchangeable")

model.set <- list(gee1, gee2, gee3, gee3.I, gee3.Ex)
mod.names <- c("gee1", "gee2", "gee3", "gee3.I", "gee3.Ex")
qictab(model.set, mod.names)

{ ~kwd1 }
{ ~kwd2 }
```

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