

Package ‘ccrm’

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Title CCC-RM

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Depends R (>= 2.08.0), nlme, gdata

Description Concordance Correlation Coefficient for repeated measures.
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License GPL (>= 2)

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bdaw	<i>Blood draw data</i>
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Description

Data in which plasma cortisol AUC was calculated from the trapezoidal rule over the 12-hr period of the hourly blood draws. Data from five visits on each of subjects.

Usage

bdaw

Format

SUBJ Number of subject
VNUM Number of time
cort_suc Plasma cortisol AUC
met Number of observer

bfat	<i>Body fat data</i>
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Description

Data in which percentage body fat was estimated from skinfold calipers and DEXA on a cohort of 90 adolescent girls. Skinfold caliper and DEXA measurements were taken at ages 12.5, 13 and 13.5.

Usage

bfat

Format

SUBJECT Number of subject
VISITNO Number of time
bf Percentage body fat
met Number of observer

bpres	<i>Blood pressure data</i>
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Description

Systolic and diastolic blood pressure was measured in a sample of 384 subjects using a handle mercury sphygmomanometer device and an automatic device.

Usage

bpres

Format

ID Number of subject
SEXO Sex of subject
EDAD Age of subject
SIS Systolic blood pressure
DIA Diastolic blood pressure
NM Number of visit
METODE Number of observer

ccclon	<i>Longitudinal Repeated Measures Concordance Correlation Coefficient estimated by Variance Components</i>
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Description

Estimates the concordance correlation coefficient for repeated measurements using the variance components from a linear mixed model.

Usage

```
ccclon(dataset,ry,rind,rtime,rmet,covar=NULL,rho=0)
## Default S3 method:
ccclon(dataset,ry,rind,rtime,rmet,covar=NULL,rho=0)
## S3 method for class 'ccclon'
print(x,...)
## S3 method for class 'ccclon'
summary(object,...)
## S3 method for class 'summary.ccclon'
print(x,...)
```

Arguments

dataset	Name of data set
ry	Character string indicating the outcome in data set
rind	Character string indicating the subject variable in data set
rmet	Character string indicating the method variable in data set
rtime	Character string indicating the time variable in data set
covar	Character vector indicating the covariables
rho	Within subject correlation structure. The value 0 stands for compound symmetry and 1 for autoregressive order one
x	Object class ccclon
object	Object class ccclon
...	other arguments to be passed to print or summary

Value

An object of class ccclon. The generic function print and summary gives the estimates of the concordance correlation coefficient. The object ccclon contains the following components:

model	Linear mixed model output
vc	Variance Components estimates
sigma	An approximate covariance matrix for the variance components
ccc.p	The Concordance Correlation Coefficient estimate
ccc.i	Vector containing the Concordance Correlation Coefficient estimate, standard error, 95 percent confidence intervals. Additionally Z Fisher's transformation and its standard error are provided

References

King, T. S., Chinchilli, V. M., Carrasco, J. L. (2007). A repeated measures concordance correlation coefficient. *Statistics in Medicine* 26(16):3095-3113

Carrasco, J. L., King, T. S., and Chinchilli, V. M. (2009). The concordance correlation coefficient for repeated measures estimated by variance components. *Journal of Biopharmaceutical Statistics* 19, 90-105.

Examples

```
data(bdaw)

result<-ccclon(bdaw,"cort_auc","SUBJ","VNUM","met")
result

summary(result)
```

ccclonw	<i>Weighted Longitudinal Repeated Measures Concordance Correlation Coefficient estimated by Variance Components</i>
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Description

Estimates the weighted concordance correlation coefficient for repeated measurements using the variance components from a linear mixed model. The different weights are assigned according to the repeated measures.

Usage

```
ccclonw(dataset,ry,rind,rtime,rmet,vecD,covar=NULL,rho=0)
## Default S3 method:
ccclonw(dataset,ry,rind,rtime,rmet,vecD,covar=NULL,rho=0)
## S3 method for class 'ccclonw'
print(x,...)
## S3 method for class 'ccclonw'
summary(object,...)
## S3 method for class 'summary.ccclonw'
print(x,...)
```

Arguments

dataset	Name of data set
ry	Character string indicating the outcome in data set
rind	Character string indicating the subject variable in data set
rmet	Character string indicating the method variable in data set
rtime	Character string indicating the time variable in data set
vecD	Vector of weights
covar	Character vector indicating the covariables
rho	Within subject correlation structure. The value 0 stands for compound symmetry and 1 for autoregressive order one
x	Object class ccclonw
object	Object class ccclonw
...	other arguments to be passed to print or summary

Value

An object of class ccclonw. The generic function print and summary gives the estimates of the concordance correlation coefficient. The object ccclonw contains the following components:

model	Linear mixed model output
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vc	Variance Components estimates
sigma	An approximate covariance matrix for the variance components
ccc.p	The Concordance Correlation Coefficient estimate
ccc.i	Vector containing the Concordance Correlation Coefficient estimate, standard error, 95 percent confidence intervals. Additionally Z Fisher's transformation and its standard error are provided

References

King, T. S., Chinchilli, V. M., Carrasco, J. L. (2007). A repeated measures concordance correlation coefficient. *Statistics in Medicine* 26(16):3095-3113

Carrasco, J. L., King, T. S., and Chinchilli, V. M. (2009). The concordance correlation coefficient for repeated measures estimated by variance components. *Journal of Biopharmaceutical Statistics* 19, 90-105.

Examples

```
data(bfat)

result<-ccclonw(bfat,"bf","SUBJECT","VISITNO","met",vecD=c(2,1,1))
result

summary(result)
```

cccrm

CCC-RM

Description

Concordance Correlation Coefficient for repeated measures

Details

Package:cccrm

Title: CCC-RM

Version: 1.1

Date: 2012-03-21

Author: Josep Lluís Carrasco <jlcarrasco@ub.edu>, Josep Puig Martínez <j.puig04@gmail.com>, Lluís Jover <lluis_jover@ub.edu>

Maintainer: Josep Puig Martínez <j.puig04@gmail.com>

Depends: R (>= 2.08.0), nlme, gdata

Description: Concordance Correlation Coefficient for repeated measures

License: GPL version 2 or newer

Value

Functions:

cccvc	Concordance Correlation Coefficient by Variance Components
ccc1on	Longitudinal Repeated Measures Concordance Correlation Coefficient estimated by Variance Components
ccc1onw	Weighted Longitudinal Repeated Measures Concordance Correlation Coefficient estimated by Variance Components
cccUst	Repeated Measures Concordance Correlation Coefficient estimated by U statistics

cccUst	<i>Repeated Measures Concordance Correlation Coefficient estimated by U statistics</i>
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Description

Estimates the concordance correlation coefficient for repeated measurements using the U statistics approach. This function is also appropriate for the non-repeated measures setting subject and observer.

Usage

```
cccUst(dataset,ry,rmet,rtime,Dmat=NULL,delta=1)
## Default S3 method:
cccUst(dataset,ry,rmet,rtime,Dmat=NULL,delta=1)
## S3 method for class 'cccUst'
print(x,...)
## S3 method for class 'cccUst'
summary(object,...)
## S3 method for class 'summary.cccUst'
print(x,...)
```

Arguments

dataset	Name of data set
ry	Character string indicating the outcome in data set
rmet	Character string indicating the method variable in data set
rtime	Character string indicating the time variable in data set
Dmat	Matrix of weights
delta	The power of the differences. Delta=0 yields a parameter that is comparable to repeated measures version of kappa
x	Object class cccUst
object	Object class cccUst
...	other arguments to be passed to print or summary

Value

An object of class cccUst. The generic function print and summary gives the estimates of the concordance correlation coefficient. The object cccUst contains the following components:

CCC	Coficient of concordance
se	Standard Error of CCC
low	Lower limit of the confidence interval ccc
up	upper limit of the confidence interval ccc
Z	Z trasformation
seZ	Standard Error of Z trasformation

References

King, T. S. and Chinchilli, V. M. (2001). A generalized concordance correlation coefficient for continuous and categorical data. *Statistics in Medicine* 20, 2131-2147.

King, T. S., Chinchilli, V. M., Carrasco, J. L. (2007). A repeated measures concordance correlation coefficient. *Statistics in Medicine* 26(16):3095-3113

Examples

```
#No Longitudinal dataset
data(bpres)
bp1<-bpres[bpres$NM==1,]

result<-cccUst(bp1,"DIA","METODE")
result

summary(result)

#Longitudinal dataset
data(bdaw)

result2<-cccUst(bdaw,"cort_auc","met","VNUM")
result2

summary(result2)

#Weighed lognitudinal dataset
data(bfat)

result3<-cccUst(bfat,"bf","met","VISITNO",Dmat=diag(c(2,1,1)))
result3

summary(result3)
```


Description

Estimates the concordance correlation coefficient through the variance components of a linear mixed model

Usage

```
cccvc(dataset,ry,rind,rmet,covar=NULL,int=FALSE)
cccvc1(dataset,ry,rind,rmet,covar=NULL)
## Default S3 method:
cccvc1(dataset,ry,rind,rmet,covar=NULL)
## S3 method for class 'cccvc1'
print(x,...)
## S3 method for class 'cccvc1'
summary(object,...)
## S3 method for class 'summary.cccvc1'
print(x,...)
cccvc2(dataset,ry,rind,rmet,covar=NULL)
## Default S3 method:
cccvc2(dataset,ry,rind,rmet,covar=NULL)
## S3 method for class 'cccvc2'
print(x,...)
## S3 method for class 'cccvc2'
summary(object,...)
## S3 method for class 'summary.cccvc2'
print(x,...)
```

Arguments

dataset	Name of data set
ry	Character string indicating the outcome in data set
rind	Character string indicating the subject variable in data set
rmet	Character string indicating the method variable in data set
covar	Character vector indicating the covariables
int	Boolean value indicating whether the Subject-Method interaction is included in the model
x	Object class cccvc
object	Object class cccvc
...	other arguments to be passed to print or summary

Value

An object of class `cccvc`. The generic function `print` and `summary` gives the estimates of the concordance correlation coefficient. The object `cccvc` contains the following components:

<code>model</code>	Linear mixed model output
<code>vc</code>	Variance Components estimates
<code>sigma</code>	An approximate covariance matrix for the variance components
<code>ccc.p</code>	The Concordance Correlation Coefficient estimate
<code>ccc.i</code>	Vector containing the Concordance Correlation Coefficient estimate, standard error, 95 percent confidence intervals. Additionally Z Fisher's transformation and its standard error are provided

References

Carrasco, J. L., Jover, L. (2003). Estimating the generalized concordance correlation coefficient through variance components. *Biometrics* 59 849 858

Carrasco, J. L., King, T. S., and Chinchilli, V. M. (2009). The concordance correlation coefficient for repeated measures estimated by variance components. *Journal of Biopharmaceutical Statistics* 19, 90 105.

Examples

```
data(bpres)

#Case without interaction

result1<-cccvc(bpres,"DIA","ID","METODE")
result1

summary(result1)

#Case adjusted by covariates

result2<-cccvc(bpres,"DIA","ID","METODE",cov=c("EDAD","SEXO"))
result2

summary(result2)
```

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