Package 'mitools'

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Title Tools for multiple imputation of missing data

Version 2.3

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Description Tools to perform analyses and combine results from multiple-imputation datasets.

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Suggests RODBC, DBI, foreign

License GPL-2

Repository CRAN

Depends R (>= 2.10)

NeedsCompilation no

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R topics documented:

`imputationList` *Constructor for imputationList objects*

Description

Create and update `imputationList` objects to be used as input to other `MI` routines.

Usage

```
imputationList(datasets,...)
## Default S3 method:
imputationList(datasets,...)
## S3 method for class 'character'
imputationList(datasets,dbtype,dbname,...)
## S3 method for class 'imputationList'
update(object,...)
## S3 method for class 'imputationList'
rbind(...)
## S3 method for class 'imputationList'
cbind(...)
```

Arguments

datasets	a list of data frames corresponding to the multiple imputations, or a list of names of database tables or views
dbtype	"ODBC" or a database driver name for DBI::dbDriver()
dbname	Name of the database
object	An object of class imputationList
...	Arguments tag=expr to update will create new variables tag by evaluating expr in each imputed dataset. Arguments to imputationList() are passed to the database driver

Details

When the arguments to imputationList() are character strings a database-based imputation list is created. This can be a database accessed through ODBC with the RODBC package or a database with a DBI-compatible driver. The dbname and ... arguments are passed to dbConnect() or odbcConnect() to create a database connection. Data are read from the database as needed.

For a database-backed object the update() method creates variable definitions that are evaluated as the data are read, so that read-only access to the database is sufficient.

Value

An object of class imputationList or DBimputationList

Examples

```
## Not run:
## CRAN doesn't like this example
data.dir <- system.file("dta",package="mitools")
files.men <- list.files(data.dir,pattern="m.\\.dta$",full=TRUE)
men <- imputationList(lapply(files.men, foreign::read.dta))
files.women <- list.files(data.dir,pattern="f.\\.dta$",full=TRUE)
women <- imputationList(lapply(files.women, foreign::read.dta))
men <- update(men, sex=1)
women <- update(women,sex=0)
```

```
all <- rbind(men,women)
all <- update(all, drinkreg=as.numeric(drkfre)>2)
all

## End(Not run)
```

`MIcombine` *Multiple imputation inference*

Description

Combines results of analyses on multiply imputed data sets. A generic function with methods for `imputationResultList` objects and a default method. In addition to point estimates and variances, `MIcombine` computes Rubin's degrees-of-freedom estimate and rate of missing information.

Usage

```
MIcombine(results, ...)
## Default S3 method:
MIcombine(results,variances,call=sys.call(),df.complete=Inf,...)
## S3 method for class 'imputationResultList'
MIcombine(results,call=NULL,df.complete=Inf,...)
```

Arguments

`results`	A list of results from inference on separate imputed datasets
`variances`	If `results` is a list of parameter vectors, `variances` should be the corresponding variance-covariance matrices
`call`	A function call for labelling the results
`df.complete`	Complete-data degrees of freedom
`...`	Other arguments, not used

Details

The `results` argument in the default method may be either a list of parameter vectors or a list of objects that have `coef` and `vcov` methods. In the former case a list of variance-covariance matrices must be supplied as the second argument.

The complete-data degrees of freedom are used when a complete-data analysis would use a t-distribution rather than a Normal distribution for confidence intervals, such as some survey applications.

Value

An object of class `MIresult` with `summary` and `print` methods

References

~put references to the literature/web site here ~

See Also

MIextract, with.imputationList

Examples

```
data(smi)
models<-with(smi, glm(drinkreg~wave*sex,family=binomial()))
summary(MIcombine(models))

betas<-MIextract(models,fun=coef)
vars<-MIextract(models, fun=vcov)
summary(MIcombine(betas,vars))
```

MIextract *Extract a parameter from a list of results*

Description

Used to extract parameter estimates and standard errors from lists produced by with.imputationList.

Usage

```
MIextract(results, expr, fun)
```

Arguments

results	A list of objects
expr	an expression
fun	a function of one argument

Details

If expr is supplied, it is evaluated in each element of results. Otherwise each element of results is passed as an argument to fun.

Value

A list

See Also

with.imputationList, MIcombine

Examples

```
data(smi)
models<-with(smi, glm(drinkreg~wave*sex,family=binomial()))

betas<-MIextract(models,fun=coef)
vars<-MIextract(models, fun=vcov)
summary(MIcombine(betas,vars))
```

`smi` *Multiple imputations*

Description

An `imputationList` object containing five imputations of data from the Victorian Adolescent Health Cohort Study.

Usage

```
data(smi)
```

Format

The underlying data are in a data frame with 1170 observations on the following 12 variables.

id a numeric vector

wave a numeric vector

mmetro a numeric vector

parsmk a numeric vector

drkfre a factor with levels `Non drinker` `not in last wk` `<3 days last wk` `>=3 days last wk`

alcdos a factor with levels `Non drinker` `not in last wk` `av <5units/drink_day` `av =>5units/drink_day`

alcdhi a numeric vector

smk a factor with levels `non/ex-smoker` `<6 days` `6/7 days`

cistot a numeric vector

mdrkfre a numeric vector

sex a numeric vector

drinkreg a logical vector

Source

Carlin, JB, Li, N, Greenwood, P, Coffey, C. (2003) "Tools for analysing multiple imputed datasets" The Stata Journal 3; 3: 1-20.

Examples

```
data(smi)
with(smi, table(sex, drkfre))
model1<-with(smi, glm(drinkreg~wave*sex, family=binomial()))
MIcombine(model1)
summary(MIcombine(model1))
```

`with.imputationList` *Evaluate an expression in multiple imputed datasets*

Description

Performs a computation of each of imputed datasets in `data`

Usage

```
## S3 method for class 'imputationList'
with(data, expr, fun, ...)
```

Arguments

`data`	An `imputationList` object
`expr`	An expression
`fun`	A function taking a data frame argument
`...`	Other arguments, passed to `fun`

Details

If `expr` is supplied, evaluate it in each dataset in `data`; if `fun` is supplied, it is evaluated on each dataset. If all the results inherit from `"imputationResult"` the return value is an `imputationResultList` object, otherwise it is an ordinary list.

Value

Either a list or an `imputationResultList` object

See Also

`imputationList`

Examples

```
data(smi)
models<-with(smi, glm(drinkreg~wave*sex,family=binomial()))
tables<-with(smi, table(drkfre,sex))
with(smi, fun=summary)
```

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