Package ‘memisc’

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Type Package

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Description An infrastructure for the management of survey data including value labels, definable missing values, recoding of variables, production of code books, and import of (subsets of) 'SPSS' and 'Stata' files is provided. Further, the package allows to produce tables and data frames of arbitrary descriptive statistics and (almost) publication-ready tables of regression model estimates, which can be exported to 'LaTeX' and HTML.

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LazyLoad Yes

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Enhances AER, car, eha, lme4, ordinal, simex, tibble, haven

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**Description**

Annotations, that is, objects of class "annotation", are character vectors with all their elements named. Only one method is defined for this subclass of character vectors, a method for `show`, that shows the annotation in a nicely formatted way. Annotations of an object can be obtained via the function `annotation(x)` and can be set via `annotation(x) <- value`.

Elements of an annotation with names "description" and "wording" have a special meaning. The first kind can be obtained and set via `description(x)` and `description(x) <- value`, the second kind can be obtained via `wording(x)` and `wording(x) <- value`. "description" elements are used in way the "variable labels" are used in SPSS and Stata. "wording" elements of annotation objects are meant to contain the question wording of a questionnaire item represented by an "item" objects. These elements of annotations are treated in a special way in the output of the `coodbook` function.

**Usage**

```r
annotation(x)
## S4 method for signature 'ANY'
annotation(x)
## S4 method for signature 'item'
annotation(x)
## S4 method for signature 'data.set'
annotation(x)
```
annotation(x) <- value
## S4 replacement method for signature 'ANY, character'
annotation(x) <- value
## S4 replacement method for signature 'ANY, annotation'
annotation(x) <- value
## S4 replacement method for signature 'item, annotation'
annotation(x) <- value
## S4 replacement method for signature 'vector, annotation'
annotation(x) <- value

description(x)
description(x) <- value

wording(x)
wording(x) <- value

## S4 method for signature 'data.set'
description(x)
description(x)
## S4 method for signature 'importer'
description(x)

Arguments

x an object

value a character or annotation object

Value

annotation(x) returns an object of class "annotation", which is a named character. description(x) and wording(x) each usually return a character string. If description(x) is applied to a data.set or an importer object, however, a character vector is returned, which is named after the variables in the data set or the external file.

Examples

vote <- sample(c(1, 2, 3, 8, 9, 97, 99), size=30, replace=TRUE)
labels(vote) <- c(Conservatives = 1,
                 Labour = 2,
                 "Liberal Democrats" = 3,
                 "Don't know" = 8,
                 "Answer refused" = 9,
                 "Not applicable" = 97,
                 "Not asked in survey" = 99)

missing.values(vote) <- c(97, 99)
description(vote) <- "Vote intention"
wording(vote) <- "If a general election would take place next tuesday, the candidate of which party would you vote for?"
annotation(vote)
annotation(vote)["Remark"] <- "This is not a real questionnaire item, of course ..."
applyTemplate

codebook(vote)

---

**applyTemplate**  
*Apply a Formatting Template to a Numeric or Character Vector*

**Description**  
applyTemplate is called internally by `mtable` to format coefficients and summary statistics.

**Usage**  
```r
applyTemplate(x, template, float.style = getOption("float.style"),
              digits = min(3, getOption("digits")),
              signif.symbols = getOption("signif.symbols"))
```

**Arguments**

- `x`: a numeric or character vector to be formatted
- `template`: a character vector that defines the template, see details.
- `float.style`: A character string that is passed to `formatC` by `applyTemplate`: valid values are "e", "f", "g", "fg", "E", and "G". By default, the `float.style` setting of `options` is used. The 'factory fresh' setting is `options(float.style="f")`.
- `digits`: number of significant digits to use if not specified in the template.
- `signif.symbols`: a named vector that specifies how significance levels are symbolically indicated, values of the vector specify significance levels and names specify the symbols. By default, the `signif.symbols` setting of `options` is used. The "factory-fresh" setting is `options(signif.symbols=c("***"=.001,"**"=.01,"*"=.05))`.

**Details**  
Character vectors that are used as templates may be arbitrary. However, certain character sequences may form *template expressions*. A template expression is of the form `($<POStag>:<Format spec>)`, where "($)" indicates the start of a template expression, "<POStag>" stands for either an index or name that selects an element from `x` and "<Format spec>" stands for a *format specifier*. It may contain an letter indicating the style in which the vector element selected by `<POStag>` will be formatted by `formatC`, it may contain a number as the number of significant digits, a "#" indicating that the number of significant digits will be at most that given by `getOption("digits")`, or "*" that means that the value will be formatted as a significance symbol.

**Value**  
applyTemplate returns a character vector in which template expressions in `template` are substituted by formatted values from `x`. If `template` is an array then the return value is also an array of the same shape.
as.array

Converting Data Frames into Arrays

Description

The as.array for data frames takes all factors in a data frame and uses them to define the dimensions of the resulting array, and fills the array with the values of the remaining numeric variables.

Currently, the data frame must contain all combinations of factor levels.

Usage

```r
## S4 method for signature 'data.frame'
as.array(x, data.name=NULL, ...)
```

Arguments

- `x`: a data frame
- `data.name`: a character string, giving the name attached to the dimension that corresponds to the numerical variables in the data frame (that is, the name attached to the corresponding element of the dimnames list).
- `...`: other arguments, ignored.

Value

An array

Examples

```r
BerkeleyAdmissions <- to.data.frame(UCBAdmissions)
BerkeleyAdmissions
as.array(BerkeleyAdmissions, data.name="Admit")
try(as.array(BerkeleyAdmissions[-1,], data.name="Admit"))
```
as.symbols

**Construction of Lists of Symbols**

**Description**

as.symbols and syms are functions potentially useful in connection with foreach and xapply. as.symbols produces a list of symbols from a character vector, while syms returns a list of symbols from symbols given as arguments, but it can be used to construct patterns of symbols.

**Usage**

```r
as.symbols(x)
syms(...,paste=FALSE,sep=NULL)
```

**Arguments**

- `x`: a character vector
- `...`: character strings or (unquoted) variable names
- `paste`: logical value; should the character strings be pasted into one string?
- `sep`: a separator string, passed to `paste`.

**Value**

A list of language symbols (results of `as.symbol` - not graphical symbols!).

**Examples**

```r
as.symbols(letters[1:8])
syms("a",1:3,paste=TRUE)

sapply(syms("a",1:3,paste=TRUE),typeof)
```

---

**By**

**Conditional Evaluation of an Expression**

**Description**

The function `By` evaluates an expression within subsets of a data frame, where the subsets are defined by a formula.

**Usage**

```r
By(formula,expr,data=parent.frame())
```
cases

Distinguish between Cases Specified by Logical Conditions

Description

cases allows to distinguish several cases defined logical conditions. It can be used to code these cases into a vector. The function can be considered as a multi-condition generalization of ifelse.

Usage

cases(...,check.xor)

Arguments

... A sequence of logical expressions or assignment expressions containing logical expressions as "right hand side".

check.xor character (either "warn", "stop", or "ignore") or logical; if TRUE or equal to "stop" or "warn", cases checks, whether the case conditions are mutually exclusive and exhaustive. If this is not satisfied and check.xor equals "warn" a warning is shown, otherwise an error exception is raised.
Details

There are two distinct ways to use this function. Either the function can be used to construct a factor that represents several logical cases or it can be used to conditionally evaluate an expression in a manner similar to `ifelse`.

For the first use, the ... arguments have to be a series of logical expressions. `cases` then returns a factor with as many levels as logical expressions given as ... arguments. The resulting factor will attain its first level if the first condition is TRUE, otherwise it will attain its second level if the second condition is TRUE, etc. The levels will be named after the conditions or, if name tags are attached to the logical expressions, after the tags of the expressions. Not that the logical expressions all need to evaluate to logical vectors of the same length, otherwise an error condition is raised.

For the second use, the ... arguments have to be a series of assignment expression of the type `<expression> <- <logical expression>` or `<logical expression> -> <expression>`. For cases in which the first logical expression is TRUE, the result of first expression that appears on the other side of the assignment operator become elements of the vector returned by `cases`, for cases in which the second logical expression is TRUE, the result of the second expression that appears on the other side of the assignment operator become elements of the vector returned by `cases`, etc. Note that the logical expressions also here all need to evaluate to logical vectors of the same length. The expressions on the other side of the assignment operator should also be either vectors of the same length and mode or should scalars of the same mode, otherwise unpredictable results may occur.

Value

If it is called with logical expressions as ... arguments, `cases` returns a factor, if it is called with assignment expressions the function returns a vector with the same mode as the results of the "assigned" expressions and with the same length as the logical conditions.

Examples

```r
# Examples of the first kind of usage of the function
#
df <- data.frame(x = rnorm(n=20), y = rnorm(n=20))
df <- df[do.call(order,df),]
(df <- within(df, {
  x1=cases(x>0,x<=0)
  y1=cases(y>0,y<=0)
  z1=cases("Condition 1"=x<0,
            "Condition 2"=y<0,# only applies if x >= 0
            "Condition 3"=TRUE )
  z2=cases(x<0,(x>=0 & y <0), (x>0 & y >=0))
}))
xtabs(~x1+y1,data=df)
```

```r
dd <- with(df,
  try(cases(x<0,
           x>=0,
           x>1,
           check.xor=TRUE)# let's be fussy
    )
  )
```
dd <- with(df,
  try(cases(x<0,x>=0,x>1))
)
genTable(range(x)-dd,data=df)

# An example of the second kind of usage of the function:
# A construction of a non-smooth function
#
fun <- function(x)
cases(
  x==0 -> 1,  
  abs(x)> 1 -> abs(x),  
  abs(x)<=1 -> x^2
)
x <- seq(from=-2,to=2,length=101)
plot(fun(x)-x)

---

codebook

Generate a Codebook of a Data Set

Description

Function codebook collects documentation about an item, or the items in a data set or external data file. It returns an object that, when shown, print this documentation in a nicely formatted way.

Usage

codebook(x)
## S4 method for signature 'item'
codebook(x)
## S4 method for signature 'atomic'
codebook(x)
## S4 method for signature 'factor'
codebook(x)
## S4 method for signature 'data.set'
codebook(x)
## S4 method for signature 'data.frame'
codebook(x)
## S4 method for signature 'importer'
codebook(x)

Arguments

x an item, numeric or character vector, factor, data.set, data.frame or importer object for codebook()

Value

An object of class "codebook", for which a show method exists that produces a nicely formatted output.
Examples

Data <- data.set(
    vote = sample(c(1,2,3,8,9,97,99), size=300, replace=TRUE),
    region = sample(c(rep(1,3),rep(2,2),3,99), size=300, replace=TRUE),
    income = exp(rnorm(300, sd=.7))*2000
)

Data <- within(Data,
    description(vote) <- "Vote intention"
    description(region) <- "Region of residence"
    description(income) <- "Household income"
    wording(vote) <- "If a general election would take place next tuesday, the candidate of which party would you vote for?"
    wording(income) <- "All things taken into account, how much do all household members earn in sum?"
    foreach(x=c(vote,region),{
        measurement(x) <- "nominal"
    })
    measurement(income) <- "ratio"
    labels(vote) <- c(
        Conservatives = 1,
        Labour = 2,
        "Liberal Democrats" = 3,
        "Don’t know" = 8,
        "Answer refused" = 9,
        "Not applicable" = 97,
        "Not asked in survey" = 99)
    labels(region) <- c(
        England = 1,
        Scotland = 2,
        Wales = 3,
        "Not applicable" = 97,
        "Not asked in survey" = 99)
    foreach(x=c(vote,region,income),{
        annotation(x)["Remark"] <- "This is not a real survey item, of course ..."
    })
    missing.values(vote) <- c(8,9,97,99)
    missing.values(region) <- c(97,99)
)

description(Data)

codebook(Data)

## Not run:
Write(description(Data),
    file="Data-desc.txt")
Write(codebook(Data),
    file="Data-cdbk.txt")

## End(Not run)
Describe structure of Data Sets and Importers

The function `codeplan()` creates a data frame that describes the structure of an item list (a data set object or an importer object), so that this structure can be stored and recovered. The resulting data frame has a particular print method that delimits the output to one line per variable.

With `setCodeplan` an item list structure (as returned by `codeplan()`) can be applied to a data frame or data set. It is also possible to use an assignment like `codeplan(x) <- value` to a similar effect.

Usage

```r
codeplan(x)
## S4 method for signature 'item.list'

codeplan(x)
setCodeplan(x,value)
## S4 method for signature 'data.frame,codeplan'
setCodeplan(x,value)
## S4 method for signature 'data.set,codeplan'
setCodeplan(x,value)
codeplan(x) <- value
```

Arguments

- `x` for `codeplan(x)` an object that inherits from class "item.list", i.e. can be a "data.set" object or an "importer" object; for `codeplan(x) <- value` or `setCodeplan(x,value)` a data frame.
- `value` an object as it would be returned by `codeplan(x)`

Value

If applicable `codeplan` returns a data frame with additional S3 class attribute "codeplan". For arguments for which the relevant information does not exist, the function returns `NULL`. Such a data frame has the following variables:

- `name` The name of the item/variable in the item list or data set.
- `description` The description/variable label string of the item/variable.
- `annotation` code to recreate the annotation attribute.
- `labels` code to recreate the value labels.
- `value.filter` code to recreate the value filter attribute (declaration of missing values, range of valid values, or an enumeration of valid values.)
- `mode` a character string that describes storage mode, such as "character", "integer", or "numeric".
- `measurement` a character string with the measurement level, "nominal", "ordinal", "interval", or "ratio".
**Examples**

Data1 <- data.set(
    vote = sample(c(1,2,3,8,9,97,99),size=300,replace=TRUE),
    region = sample(c(rep(1,3),rep(2,2),3,99),size=300,replace=TRUE),
    income = exp(rnorm(300,sd=.7))*2000
)

Data1 <- within(Data1,
    description(vote) <- "Vote intention"
    description(region) <- "Region of residence"
    description(income) <- "Household income"
    foreach(x=c(vote,region),{
        measurement(x) <- "nominal"
    })
    measurement(income) <- "ratio"
    labels(vote) <- c(
        Conservatives = 1,
        Labour = 2,
        "Liberal Democrats" = 3,
        "Don't know" = 8,
        "Answer refused" = 9,
        "Not applicable" = 97,
        "Not asked in survey" = 99)
    labels(region) <- c(
        England = 1,
        Scotland = 2,
        Wales = 3,
        "Not applicable" = 97,
        "Not asked in survey" = 99)
    foreach(x=c(vote,region,income),{
        annotation(x)["Remark"] <- "This is not a real survey item, of course ..."
    })
    missing.values(vote) <- c(8,9,97,99)
    missing.values(region) <- c(97,99)
)

cpData1 <- codeplan(Data1)

Data2 <- data.frame(
    vote = sample(c(1,2,3,8,9,97,99),size=300,replace=TRUE),
    region = sample(c(rep(1,3),rep(2,2),3,99),size=300,replace=TRUE),
    income = exp(rnorm(300,sd=.7))*2000
)

codeplan(Data2) <- cpData1
codebook(Data2)
Description

`collect` gathers several objects into one, matching the elements or subsets of the objects by `names` or `dimnames`.

Usage

```r
collect(..., names=NULL, inclusive=TRUE)
## Default S3 method:
collect(..., names=NULL, inclusive=TRUE)
## S3 method for class 'array'
collect(..., names=NULL, inclusive=TRUE)
## S3 method for class 'matrix'
collect(..., names=NULL, inclusive=TRUE)
## S3 method for class 'table'
collect(..., names=NULL, sourcename=".origin", fill=0)
## S3 method for class 'data.frame'
collect(..., names=NULL, inclusive=TRUE, 
fussy=FALSE, warn=TRUE, sourcename=".origin")
## S3 method for class 'data.set'
collect(..., names=NULL, inclusive=TRUE, 
fussy=FALSE, warn=TRUE, sourcename=".origin")
```

Arguments

- `...`: more atomic vectors, arrays, matrices, tables, data.frames or data.sets
- `names`: optional character vector; in case of the default and array methods, giving `dimnames` for the new dimension that identifies the collected objects; in case of the data.frame and data.set methods, levels of a factor indentifying the collected objects.
- `inclusive`: logical, defaults to TRUE; should unmatched elements included? See details below.
- `fussy`: logical, defaults to FALSE; should it count as an error, if variables with same names of collected data.frames/data.sets have different attributes?
- `warn`: logical, defaults to TRUE; should an warning be given, if variables with same names of collected data.frames/data.sets have different attributes?
- `sourcename`: name of the factor that identifies the collected data.frames or data.sets
- `fill`: numeric; with what to fill empty table cells, defaults to zero, assuming the table contains counts

Value

If `x` and all following `...` arguments are vectors of the same mode (numeric, character, or logical) the result is a matrix with as many columns as vectors. If argument `inclusive` is TRUE, then the number of rows equals the number of names that appear at least once in each of the vector names and the matrix is filled with `NA` where necessary, otherwise the number of rows equals the number of names that are present in all vector names.

If `x` and all `...` arguments are matrices or arrays of the same mode (numeric, character, or logical) and `n` dimension the result will be a `n+1` dimensional array or table. The extend of the `n+1`th dimension
equals the number of matrix, array or table arguments, the extends of the lower dimension depends on the inclusive argument: either they equal to the number of dimnames that appear at least once for each given dimension and the array is filled with NA where necessary, or they equal to the number of dimnames that appear in all arguments for each given dimension.

If x and all ... arguments are tables then the result will be a table. The result

If x and all ... arguments are data frames or data sets, the result is a data frame or data set. The number of variables of the resulting data frame or data set depends on the inclusive argument. If it is true, the number of variables equals the number of variables that appear in each of the arguments at least once and variables are filled with NA where necessary, otherwise the number of variables equals the number of variables that are present in all arguments.

Examples

```r
x <- c(a=1,b=2)
y <- c(a=10,c=30)

x
y

collect(x,y)
collect(x,y,inclusive=FALSE)

X <- matrix(1,nrow=2,ncol=2,dimnames=list(letters[1:2],LETTERS[1:2]))
Y <- matrix(2,nrow=3,ncol=2,dimnames=list(letters[1:3],LETTERS[1:2]))
Z <- matrix(3,nrow=2,ncol=3,dimnames=list(letters[1:2],LETTERS[1:3]))

X
Y
Z

collect(X,Y,Z)
collect(X,Y,Z,inclusive=FALSE)

X <- matrix(1,nrow=2,ncol=2,dimnames=list(a=letters[1:2],b=LETTERS[1:2]))
Y <- matrix(2,nrow=3,ncol=2,dimnames=list(a=letters[1:3],c=LETTERS[1:2]))
Z <- matrix(3,nrow=2,ncol=3,dimnames=list(a=letters[1:2],c=LETTERS[1:3]))

collect(X,Y,Z)
collect(X,Y,Z,inclusive=FALSE)

df1 <- data.frame(a=rep(1,5),b=rep(1,5))
df2 <- data.frame(a=rep(2,5),b=rep(2,5),c=rep(2,5))
collect(df1,df2)
collect(df1,df2,inclusive=FALSE)

data(UCBAdmissions)
Male <- as.table(UCBAdmissions[,1,])
Female <- as.table(UCBAdmissions[,2,])
collect(Male,Female,sourcename="Gender")
collect(unclass(Male),unclass(Female))
```
Male1 <- as.table(UCBAdmissions[,1,-1])
Female2 <- as.table(UCBAdmissions[,2,-2])
Female3 <- as.table(UCBAdmissions[,2,-3])
collect(Male=Male1,Female=Female2,sourcename="Gender")
collect(Male=Male1,Female=Female3,sourcename="Gender")
collect(Male=Male1,Female=Female3,sourcename="Gender",fill=NA)

f1 <- gl(3,5,labels=letters[1:3])
f2 <- gl(3,6,labels=letters[1:3])
collect(f1=table(f1),f2=table(f2))

ds1 <- data.set(x = 1:3)
ds2 <- data.set(x = 4:9,
               y = 1:6)
collect(ds1,ds2)

---

contr

Convenience Methods for Setting Contrasts

Description

This package provides modified versions of \code{contr.treatment} and \code{contr.sum}. \code{contr.sum} gains an optional base argument, analog to the one of \code{contr.treatment}, furthermore, the base argument may be the name of a factor level.

\code{contr} returns a function that calls either \code{contr.treatment}, \code{contr.sum}, etc., according to the value given to its first argument.

The \code{contrasts} method for "item" objects returns a contrast matrix or a function to produce a contrast matrix for the factor into which the item would be coerced via \code{as.factor} or \code{as.ordered}. This matrix or function can be specified by using \code{contrasts(x)<-value}.

Usage

\code{contr(type,...)}
\code{contr.treatment(n, base=1,contrasts=TRUE)}
\code{contr.sum(n,base=NULL,contrasts=TRUE)}

## S4 method for signature 'item'
\code{contrasts(x,contrasts=TRUE,...)}

## S4 replacement method for signature 'item'
\code{contrasts(x,how.many) <- value}

# These methods are defined implicitly by making 'contrasts' generic.

## S4 method for signature 'ANY'
\code{contrasts(x,contrasts=TRUE,...)}

## S4 replacement method for signature 'ANY'
\code{contrasts(x,how.many) <- value}
Arguments

- **type**: a character vector, specifying the type of the contrasts. This argument should have a value such that, if e.g. `type=\"something\"`, then there is a function `contr.something` that produces a contrast matrix.
- **...**: further arguments, passed to `contr.treatment`, etc.
- **n**: a number of factor levels or a vector of factor levels names, see e.g. `contr.treatment`.
- **base**: a number of a factor level or the names of a factor level, which specifies the baseline category, see e.g. `contr.treatment` or NULL.
- **contrasts**: a logical value, see `contrasts`.
- **how.many**: the number of contrasts to generate, see `contrasts`.
- **x**: a factor or an object of class \"item\".
- **value**: a matrix, a function or the name of a function.

Value

`contr` returns a function that calls one of `contr.treatment`, `contr.sum`, `...`. `contr.treatment` and `contr.sum` return contrast matrices. `contrasts(x)` returns the \"contrasts\" attribute of an object, which may be a function name, a function, a contrast matrix or NULL.

Examples

```r
ctr.t <- contr("treatment",base="c")
ctr.t
ctr.s <- contr("sum",base="c")
ctr.h <- contr("helmert")
ctr.t(letters[1:7])
ctr.s(letters[1:7])
ctr.h(letters[1:7])

x <- factor(rep(letters[1:5],3))
contrasts(x)
x <- as.item(x)
contrasts(x)
contrasts(x) <- contr.sum(letters[1:5],base="c")
contrasts(x)
missing.values(x) <- 5
contrasts(x)
contrasts(as.factor(x))

# Obviously setting missing values after specifying
# contrast matrix breaks the contrasts.
# Using the 'contr' function, however, prevents this:

missing.values(x) <- NULL
contrasts(x) <- contr("sum",base="c")
contrasts(x)
missing.values(x) <- 5
contrasts(x)
contrasts(as.factor(x))
```
Data Set Objects

Description

"data.set" objects are collections of "item" objects, with similar semantics as data frames. They are distinguished from data frames so that coercion by as.data.frame leads to a data frame that contains only vectors and factors. Nevertheless most methods for data frames are inherited by data sets, except for the method for the within generic function. For the within method for data sets, see the details section.

Thus data preparation using data sets retains all informations about item annotations, labels, missing values etc. While (mostly automatic) conversion of data sets into data frames makes the data amenable for the use of R’s statistical functions.

dsView is a function that displays data sets in a similar manner as View displays data frames. (View works with data sets as well, but changes them first into data frames.)

Usage

data.set(..., row.names = NULL, check.rows = FALSE, check.names = TRUE, stringsAsFactors = default.stringsAsFactors(),
    document = NULL)

as.data.set(x, row.names=NULL, ...)

## S4 method for signature 'list'
as.data.set(x,row.names=NULL,...)

is.data.set(x)

## S3 method for class 'data.set'
as.data.frame(x, row.names = NULL, optional = FALSE, ...)

## S4 method for signature 'data.set'
within(data, expr, ...)

dsView(x)

## S4 method for signature 'data.set'
head(x,n=20,...)

## S4 method for signature 'data.set'
tail(x,n=20,...)

Arguments

... For the data.set function several vectors or items, for within further, ignored arguments.

row.names, check.rows, check.names, stringsAsFactors, optional arguments as in data.frame or as.data.frame, respectively.

document NULL or an optional character vector that contains documentation of the data.

x For is.data.set(x), any object; for as.data.frame(x,...) and dsView(x) a "data.set" object.
data

a data set, that is, an object of class "data.set".

expr

an expression, or several expressions enclosed in curly braces.

n

integer; the number of rows to be shown by head or tail

Details

The as.data.frame method for data sets is just a copy of the method for list. Consequently, all items in the data set are coerced in accordance to their measurement setting, see item and measurement.

The within method for data sets has the same effect as the within method for data frames, apart from two differences: all results of the computations are coerced into items if they have the appropriate length, otherwise, they are automatically dropped.

Currently only one method for the generic function as.data.set is defined: a method for "importer" objects.

Value

data.set and the within method for data sets returns a "data.set" object, is.data.set returns a logical value, and as.data.frame returns a data frame.

Examples

Data <- data.set(
    vote = sample(c(1,2,3,8,9,97,99),size=300,replace=TRUE),
    region = sample(c(rep(1,3),rep(2,2),3,99),size=300,replace=TRUE),
    income = exp(rnorm(300,sd=.7))*2000
)

Data <- within(Data,
    description(vote) <- "Vote intention"
    description(region) <- "Region of residence"
    description(income) <- "Household income"
    wording(vote) <- "If a general election would take place next tuesday, the candidate of which party would you vote for?"
    wording(income) <- "All things taken into account, how much do all household members earn in sum?"
    foreach(x=c(vote,region),{
        measurement(x) <- "nominal"
    })
    measurement(income) <- "ratio"
    labels(vote) <- c(
        Conservatives = 1,
        Labour = 2,
        "Liberal Democrats" = 3,
        "Don’t know" = 8,
        "Answer refused" = 9,
        "Not refused" = 97,
        "Not asked in survey" = 99)
    labels(region) <- c(
        England = 1,
```r
Scotland = 2,
Wales = 3,
"Not applicable" = 97,
"Not asked in survey" = 99

foreach(x=c(vote,region,income),{
    annotation(x)["Remark"] <- "This is not a real survey item, of course ..."
})

missing.values(vote) <- c(8,9,97,99)
missing.values(region) <- c(97,99)

# These to variables do not appear in the
# the resulting data set, since they have the wrong length.
junk1 <- 1:5
junk2 <- matrix(5,4,4)
}

# Since data sets may be huge, only a
# part of them are 'show'n

Data

## Not run:
# If we insist on seeing all, we can use 'print' instead
print(Data)

## End(Not run)

str(Data)
summary(Data)

## Not run:
# If we want to 'View' a data set we can use 'dsView'
dsView(Data)

# Works also, but changes the data set into a data frame first:
View(Data)

## End(Not run)

Data[1]
Data[1,]
head(as.data.frame(Data))

EnglandData <- subset(Data, region == "England")
EnglandData

xtabs(~vote+region, data=EnglandData)
xtabs(~vote+region, data=within(Data, vote <- include.missings(vote)))
```

---

**data.set manipulation**

*Manipulation of Data Sets*
data.set manipulation

Description

Like data frames, data.set objects have `subset, unique, cbind, rbind, merge` methods defined for them.

The semantics are basically the same as the methods defined for data frames in the base package, with the only difference that the return values are data.set objects. In fact, the methods described here are front-ends to the corresponding methods for data frames, which are constructed such that the "extra" information attached to variables within data.set objects, that is, to item objects.

Usage

```r
## S4 method for signature 'data.set'
subset(x, ...)

## S4 method for signature 'data.set'
unique(x, incomparables = FALSE, ...)

## S3 method for class 'data.set'
cbind(..., deparse.level = 1)

## S3 method for class 'data.set'
rbind(..., deparse.level = 1)

## S4 method for signature 'data.set, data.set'
merge(x, y, ...)

## S4 method for signature 'data.set, data.frame'
merge(x, y, ...)

## S4 method for signature 'data.frame, data.set'
merge(x, y, ...)
```

Arguments

- `x, y` data.set objects. One of the arguments to `merge` may also be an object coercable into a data frame and the result still is a data.set object.
- `...` for `subset`: a logical vector of the same length as the number of rows of the data.set and, optionally, a vector of variable names (tagged as `select`); for `unique`: further arguments, ignored; for `cbind`, `rbind`: objects coercable into data frames, with at least one being a data.set object; for `merge`: further arguments such as arguments tagged with `by`, `by.x`, `by.y`, etc. that specify the variables by which to merge the data sets of data frames `x` and `y`.
- `incomparables` a vector of values that cannot be compared. See `unique`.
- `deparse.level` an argument retained for reasons of compatibility of the default methods of `cbind` and `rbind`.

Examples

```r
dsl <- data.set(
```
Descriptives

```r
a = rep(1:3,5),
b = rep(1:5,each=3)
)
d2 <- data.set(
a = c(3:1,3,3),
b = 1:5
)

ds1 <- within(ds1,{
description(a) <- "Example variable 'a'"
description(b) <- "Example variable 'b'"
})
ds2 <- within(ds2,{
description(a) <- "Example variable 'a'"
description(b) <- "Example variable 'b'"
})
str(ds3 <- rbind(ds1,ds2))
description(ds3)
d3 <- within(ds1,{
c <- a
d <- b
description(c) <- "Copy of variable 'a'"
description(d) <- "Copy of variable 'b'"
rm(a,b)
})
str(ds4 <- cbind(ds1,ds3))
description(ds4)
d5 <- data.set(
c = 1:3,
d = c(1,1,2)
)
d5 <- within(ds5,{
description(c) <- "Example variable 'c'"
description(d) <- "Example variable 'd'"
})
str(ds6 <- merge(ds1,ds5,by.x="a",by.y="c"))

# Note that the attributes of the left-hand variables
# have priority.
description(ds6)
```

---

**Descriptives**

**Vectors of Univariate Sample Statistics**

**Description**

Descriptives(x) gives a vector of sample statistics for use in codebook.
Descriptives(x,...)
## S4 method for signature 'atomic'
Descriptives(x,...)
## S4 method for signature 'item.vector'
Descriptives(x,...)

Arguments

- **x**: an atomic vector or "item.vector" object.
- **...**: further arguments, to be passed to future methods.

Value

A numeric vector of sample statistics, containing the range, the mean, the standard deviation, the skewness and the (excess) kurtosis.

Examples

```r
x <- rnorm(100)
Descriptives(x)
```

---

dimrename

Change dimnames, rownames, or colnames

Description

These functions provide an easy way to change the dimnames, rownames or colnames of an array.

Usage

```r
dimrename(x, dim = 1, ..., gsub = FALSE, fixed = TRUE, warn = TRUE)
rownames(x, ..., gsub = FALSE, fixed = TRUE, warn = TRUE)
colnames(x, ..., gsub = FALSE, fixed = TRUE, warn = TRUE)
```

Arguments

- **x**: An array with dimnames
- **dim**: A vector that indicates the dimensions
- **...**: A sequence of named arguments
- **gsub**: a logical value; if TRUE, *gsub* is used to change the dimnames of the object. That is, instead of substituting whole names, substrings of the dimnames of the object can changed.
- **fixed**: a logical value, passed to *gsub*. If TRUE, substitutions are by fixed strings and not by regular expressions.
- **warn**: logical; should a warning be issued if the pattern is not found?
Details

dimrename changes the dimnames of x along dimension(s) dim according to the remaining arguments. The argument names are the old names, the values are the new names. rowrename is a shorthand for changing the rownames, colrename is a shorthand for changing the colnames of a matrix or matrix-like object.

If gsub is FALSE, argument tags are the old dimnames, the values are the new dimnames. If gsub is TRUE, arguments are substrings of the dimnames that are substituted by the argument values.

Value

Object x with changed dimnames.

Examples

```r
m <- matrix(1,2,2)
rownames(m) <- letters[1:2]
colnames(m) <- LETTERS[1:2]
m
dimrename(m,1,a="first",b="second")
dimrename(m,1,A="first",B="second")
dimrename(m,2,"A"="first",B="second")

rownames(m,a="first",b="second")
colnames(m,"A"="first",B="second")

# Since version 0.99.22 - the following also works:
dimrename(m,1,a=first,b=second)
dimrename(m,1,A=first,B=second)
dimrename(m,2,A=first,B=second)
```

---

duplicated_labels

Check for and report duplicated labels

Description

The function duplicated_labels can be used with "item" objects, "importer" objects or "data.set" objects to check whether items contain duplicate labels, i.e. labels that are attached to more than one code.

Usage

```r
duplicated_labels(x)
## S3 method for class 'item'
duplicated_labels(x)
# Applicable to 'importer' objects and 'data.set' objects
## S3 method for class 'item.list'
duplicated_labels(x)
```
**Arguments**

- **x**  
  an item with value labels or that contains items with value labels

**Value**

The function `duplicate.labels` returns a list with a class attribute, which allows pretty printing of duplicated value labels

**Examples**

```r
x1 <- as.item(rep(1:5,4),
  labels=c(
    A = 1,
    A = 2,
    B = 3,
    B = 4,
    C = 5
  ),
  annotation = c(
    description="Yet another test"
  ))

x2 <- as.item(rep(1:4,5),
  labels=c(
    i = 1,
    ii = 2,
    iii = 3,
    iii = 4
  ),
  annotation = c(
    description="Still another test"
  ))

x3 <- as.item(rep(1:2,10),
  labels=c(
    a = 1,
    b = 2
  ),
  annotation = c(
    description="Still another test"
  ))

duplicated_labels(x1)
ds <- data.set(x1,x2,x3)
duplicated_labels(ds)
```

```r
codebook(ds)
nes1948.por <- unzip(system.file("anes/NES1948.ZIP",package="memisc"),
  "NES1948.POR",exdir=tempfile())
nes1948 <- spss.portable.file(nes1948.por)
duplicated_labels(nes1948)
```
foreach

Loop over Variables in a Data Frame or Environment

Description
foreach evaluates an expression given as second argument by substituting in variables. The expression may also contain assignments, which take effect in the callers environment.

Usage
foreach(...)

Arguments
... tagged and untagged arguments. The tagged arguments define the 'variables' that are looped over, the first untagged argument defines the expression which is evaluated.

Examples
x <- 1:3
y <- -(1:3)
z <- c("Uri","Schwyz","Unterwalden")
print(x)
print(y)
print(z)
foreach(var=c(x,y,z), # assigns names
   names(var) <- letters[1:3] # to the elements of x, y, and z
)
print(x)
print(y)
print(z)

ds <- data.set(
a = c(1,2,3,2,3,8,9),
b = c(2,8,3,2,1,8,9),
c = c(1,3,2,1,2,8,8)
)
print(ds)
ds <- within(ds,
   description(a) <- "First item in questionnaire"
description(b) <- "Second item in questionnaire"
description(c) <- "Third item in questionnaire"
wording(a) <- "What number do you like first?"
wording(b) <- "What number do you like second?"
wording(c) <- "What number do you like third?"
foreach(x=c(a,b,c),{ # Lazy data documentation:
   labels(x) <- c( # a,b,c get value labels in one statement
one = 1,
two = 2,
three = 3,
"don't know" = 8,
"refused to answer" = 9)
missing.values(x) <- c(8,9)

as.data.frame(ds)

ds <- within(ds, foreach(x=c(a,b,c), {
    measurement(x) <- "interval"
}))

as.data.frame(ds)

---

**format_html**

Format Objects in HTML, show the HTML Format or Write it to a File

**Description**

`show_html` is for showing objects in a convenient way in HTML format. `write_html` writes them in HTML format into a file. Both functions call the generic `format_html` for the format conversion.

**Usage**

```r
show_html(x, output = NULL, ...)
write_html(x, file, ...)
format_html(x, ...)
```

```r
## S3 method for class 'data.frame'
format_html(x,
    toprule=2,midrule=1,bottomrule=2,
    split.dec=TRUE,
    row.names=TRUE,
    digits=getOption("digits"),
    format="f",
    style=df_format_stdstyle,
    margin="2ex auto",
    ...)
```

```r
## S3 method for class 'matrix'
format_html(x,
    toprule=2,midrule=1,bottomrule=2,
    split.dec=TRUE,
    formatC=FALSE,
    ...)```
format_html

digits=getOption("digits"),
format="f",
style=mat_format_stdstyle,
margin="2ex auto",
...

Arguments

x an object.
output character string or a function that determines how the HTML formatted object is shown.
If output is a function, it is called with the path of a (temporary) file with HTML code, e.g. RStudio's viewer function (which is available in the package rstudioapi).
If output equals "stdout", the HTML code is written to the standard output stream (for use e.g. in output produced with knitr), if "file-show", the contents of a file with the HTML code is shown via file.show, and if "browser", the contents of a file with the HTML code is shown by the standard browser (via browseURL).
This arguments has different defaults, depending of the type of the session. In non-interactive sessions, the default is "console", in interactive sessions other than RStudio, it is "browser", in interactive sessions with RStudio it is "file-show".
These default settings can be overriden by the option "html_viewer" (see options).

file character string; name or path of the file where to write the HTML code to.
toprule integer; thickness in pixels of rule at the top of the table.
midrule integer; thickness in pixels of rules within the table.
bottomrule integer; thickness in pixels of rule at the bottom of the table.
split.dec logical; whether numbers should be centered at the decimal point by splitting the table cells.
row.names logical; whether row names should be shown/exported.
digits number of digits to be shown after the decimal dot. This is only useful, if the "ftable" object was created from a table created with genTable or the like.
formatC logical; whether to use formatC instead of format to format cell contents.
format a format string for formatC
style string containing the standard CSS styling of table cells.
margin character string, determines the margin and thus the position of the HTML table.
...
other arguments, passed on to formatter functions.

Value

format_html character string with code suitable for inclusion into a HTML-file.
Description

This is the method of \texttt{format_html} for "codebook" objects as created by the eponymous function (see \texttt{codebook})

Usage

```r
## S3 method for class 'codebook'
format_html(x,
    toprule = 2, midrule = 1,
    padding = 3,
    var_tag = "code",
    varid_prefix = "", title_tag = "p", ...)
```

Arguments

- \texttt{x} a "codebook" object
- \texttt{toprule} a non-negative integer; thickness of the line (in pixels) at the top of each codebook entry
- \texttt{midrule} a non-negative integer; thickness of the line (in pixels) that separates the header of an codebook entry from its body
- \texttt{padding} a non-negative integer; left-hand padding in "ex" of the codebook entry contents
- \texttt{var_tag} character string; the HTML tag that contains the name of the variable
- \texttt{varid_prefix} character string; a prefix added to the anchor IDs of the code entry titles (to facilitate the creation of tables of contents etc.)
- \texttt{title_tag} character string; the HTML tag that contains the title of the codebook entry (the variable name and its description)
- \texttt{...} further arguments, ignored.

See Also

See Also as \texttt{format_html, show_html, write_html}. 

Description

This is the method of `format_html` for "ftable" objects (i.e. flattened contingency tables).

Usage

```r
## S3 method for class 'ftable'
format_html(x,
    show.titles = TRUE,
    digits = 0,
    format = "f",
    toprule = 2, midrule = 1, bottomrule = 2,
    split.dec = TRUE,
    style = ftable_format_stdstyle,
    margin="2ex auto",
    ...
)
## S3 method for class 'ftable_matrix'
format_html(x,
    show.titles=TRUE,
    digits=0,
    format="f",
    toprule=2,midrule=1,bottomrule=2,
    split.dec=TRUE,
    style = ftable_format_stdstyle,
    margin="2ex auto",
    varontop,varinfront,
    ...
)
```

Arguments

- `x` an object of class `ftable`.
- `show.titles` logical; should the names of the cross-classified variables be shown?
- `digits` number of digits to be shown after the decimal dot. This is only useful, if the "ftable" object was created from a table created with `genTable` or the like.
- `format` a format string for `formatC`.
- `toprule` integer; thickness in pixels of rule at the top of the table.
- `midrule` integer; thickness in pixels of rules within the table.
- `bottomrule` integer; thickness in pixels of rule at the bottom of the table.
- `split.dec` logical: whether numbers should be centered at the decimal point by splitting the table cells.
- `style` string containing the standard CSS styling of table cells.
margin character string, determines the margin and thus the position of the HTML table.

varontop logical; whether names of column variables should appear on top of factor levels

varinfront logical; whether names of row variables should appear in front of factor levels

... further arguments, ignored.

See Also

See Also as format_html, show_html, write_html.

---

ftable-matrix Combining flattened tables.

Description

With the method functions described here, flattened (contingency) tables can be combined into more complex objects, of class "ftable_matrix". For objects of these class format and print methods are provided

Usage

## S3 method for class 'ftable'
cbind(..., deparse.level=1)

## S3 method for class 'ftable'
rbind(..., deparse.level=1)

## S3 method for class 'ftable_matrix'
cbind(..., deparse.level=1)

## S3 method for class 'ftable_matrix'
rbind(..., deparse.level=1)

## S3 method for class 'ftable_matrix'
format(x,quote=TRUE,digits=0,format="f",...)

## S3 method for class 'ftable_matrix'
Write(x,
   file = "",
   quote = TRUE,
   append = FALSE,
   digits = 0,
   ...
)

## S3 method for class 'ftable_matrix'
print(x,quote=FALSE,...)
Arguments

... for cbind and rbind methods, two or more objects of class "ftable" or "ftable_matrix";
for the other methods: further arguments, ignored.
deparse.level ignored, retained for compatibility reasons only.
x an object used to select a method.
quote logical, indicating whether or not strings should be printed with surrounding
quotes.
digits numeric or integer, number of significant digits to be shown.
format a format string as in formatC
file character string, containing a file path.
append logical, should the output appended to the file?

Value

cbind and rbind, when used with "ftable" or "ftable_matrix" objects, return objects of class
"ftable_matrix".

Examples

ft1 <- ftable(Sex~Survived,Titanic)
ft2 <- ftable(Age+Class~Survived,Titanic)
ft3 <- ftable(Survived~Class,Titanic)
ft4 <- ftable(Survived~Age,Titanic)
ft5 <- ftable(Survived~Sex,Titanic)

tab10 <- xtabs(Freq~Survived,Titanic)

(c12.10 <- cbind(ft1,ft2,Total=tab10))
(r345.10 <- rbind(ft3,ft4,ft5,Total=tab10))

## Not run:
tf <- tempfile()
Write(c12.10,file=tf)
file.show(tf)
## End(Not run)

Description

genTable creates a table of arbitrary summaries conditional on given values of independent vari-
ables given by a formula.
Aggregate does the same, but returns a data.frame instead.
fapply is a generic function that dispatches on its data argument. It is called internally by
Aggregate and genTable. Methods for this function can be used to adapt Aggregate and genTable
to data sources other than data frames.
Usage

Aggregate(formula, data=parent.frame(), subset=NULL,
          names=NULL, addFreq=TRUE, drop = TRUE, as.vars=1,
          ...) 

genTable(formula, data=parent.frame(), subset=NULL,
          names=NULL, addFreq=TRUE,...)

Arguments

  formula  a formula. The right hand side includes one or more grouping variables separated by '+'. These may be factors, numeric, or character vectors. The left hand side may be empty, a numerical variable, a factor, or an expression. See details below.

  data     an environment or data frame or an object coercable into a data frame.

  subset   an optional vector specifying a subset of observations to be used.

  names    an optional character vector giving names to the result(s) yielded by the expression on the left hand side of formula. This argument may be redundant if the left hand side results in is a named vector. (See the example below.)

  addFreq  a logical value. If TRUE and data is a table or a data frame with a variable named "Freq", a call to table, Table, percent, or nvalid is supplied by an additional argument Freq and a call to table is translated into a call to Table.

  drop     a logical value. If TRUE, empty groups (i.e. when there are no observations in the aggregated data frame that contain the defining combination of values of factor levels of the conditioning variables in by) are dropped from the result of Aggregate. Otherwise, result are filled with NA, where appropriate.

  as.vars  an integer; relevant only if the left hand side of the formula returns an array or a matrix - which dimension (rows, columns, or layers etc.) will transformed to variables? Defaults to columns in case of matrices and to the highest dimensional extend in case of arrays.

  ...      further arguments, passed to methods or ignored.

Details

If an expression is given as left hand side of the formula, its value is computed for any combination of values of the values on the right hand side. If the right hand side is a dot, then all variables in data are added to the right hand side of the formula.

If no expression is given as left hand side, then the frequency counts for the respective value combinations of the right hand variables are computed.

If a single factor is on the left hand side, then the left hand side is translated into an appropriate call to table(). Note that also in this case addFreq takes effect.

If a single numeric variable is on the left hand side, frequency counts weighted by this variable are computed. In these cases, genTable is equivalent to xtabs and Aggregate is equivalent to as.data.frame(xtabs(...)).
Value

Aggregate results in a data frame with conditional summaries and unique value combinations of conditioning variables.

genTable returns a table, that is, an array with class "table".

See Also

aggregate.data.frame, xtabs

Examples

ex.data <- expand.grid(mu=c(0,100),sigma=c(1,10))[rep(1:4,rep(100,4)),]
ex.data <- within(ex.data,
  x <- rnorm(n=nrow(ex.data),
    mean=mu,
    sd=sigma
  )
)

Aggregate(~mu+sigma,data=ex.data)
Aggregate(mean(x)~mu+sigma,data=ex.data)
Aggregate(mean(x)~mu+sigma,data=ex.data,name="Average")
Aggregate(c(mean(x),sd(x))~mu+sigma,data=ex.data)
genTable(c(Mean=mean(x),StDev=sd(x),N=length(x))~mu+sigma,data=ex.data)

Aggregate(table(Admit)~.,data=UCBAdmissions)
Aggregate(Table(Admit,Freq)~.,data=UCBAdmissions)
Aggregate(Admit~.,data=UCBAdmissions)
Aggregate(percent(Admit)~.,data=UCBAdmissions)
Aggregate(percent(Admit)~Gender,data=UCBAdmissions)
Aggregate(percent(Admit)~Dept,data=UCBAdmissions)
Aggregate(percent(Gender)~Dept,data=UCBAdmissions)
Aggregate(percent(Admit)~Dept,data=UCBAdmissions,Gender="Female")
genTable(percent(Admit)~Dept,data=UCBAdmissions,Gender="Female")
Usage

```r
## S3 method for class 'lm'
getSummary(obj, alpha=.05,...)
## S3 method for class 'glm'
getSummary(obj, alpha=.05,...)
## S3 method for class 'merMod'
getSummary(obj, alpha=.05, ...)

# These are contributed by Christopher N. Lawrence
## S3 method for class 'clm'
getSummary(obj, alpha=.05,...)
## S3 method for class 'polr'
getSummary(obj, alpha=.05,...)
## S3 method for class 'simex'
getSummary(obj, alpha=.05,...)

# These are contributed by Jason W. Morgan
## S3 method for class 'aftreg'
getSummary(obj, alpha=.05,...)
## S3 method for class 'coxph'
getSummary(obj, alpha=.05,...)
## S3 method for class 'phreg'
getSummary(obj, alpha=.05,...)
## S3 method for class 'survreg'
getSummary(obj, alpha=.05,...)
## S3 method for class 'weibreg'
getSummary(obj, alpha=.05,...)

# These are contributed by Achim Zeileis
## S3 method for class 'ivreg'
getSummary(obj, alpha=.05,...)
## S3 method for class 'tobit'
getSummary(obj, alpha=.05,...)
## S3 method for class 'hurdle'
getSummary(obj, alpha=.05,...)
## S3 method for class 'zeroinfl'
getSummary(obj, alpha=.05,...)
## S3 method for class 'betareg'
getSummary(obj, alpha=.05,...)
## S3 method for class 'multinom'
getSummary(obj, alpha=.05,...)

# These are contributed by Dave Atkins
# Method for 'glm' objects - to report exponentiated coefficients.
getSummary.expcoef(obj, alpha=.05,...)
## S3 method for class 'glm'
```
getSummary_expcoef(obj, alpha=.05,...)

Arguments

obj a model object, e.g. of class `lm` or `glm`
alpha level of the confidence intervals; their coverage should be 1-alpha/2
... further arguments; ignored.

Details

The generic function `getSummary` is called by `mtable` in order to obtain the coefficients and summaries of model objects. In order to adapt `mtable` to models of classes other than `lm` or `glm` one needs to define `getSummary` methods for these classes and to set a summary template via `setSummaryTemplate`

Value

Any method of `getSummary` must return a list with the following components:

coef an array with coefficient estimates; the lowest dimension must have the following names and meanings:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>est</td>
<td>coefficient estimates</td>
</tr>
<tr>
<td>se</td>
<td>estimated standard errors</td>
</tr>
<tr>
<td>stat</td>
<td>t- or Wald-z statistics</td>
</tr>
<tr>
<td>p</td>
<td>significance levels of the statistics</td>
</tr>
<tr>
<td>lwr</td>
<td>lower confidence limits</td>
</tr>
<tr>
<td>upr</td>
<td>upper confidence limits</td>
</tr>
</tbody>
</table>

The higher dimensions of the array correspond to the individual coefficients and, in multi-equation models, to the model equations.

sumstat a vector containing the model summary statistics; the components may have arbitrary names.

Groups Operate on grouped data in data frames and data sets

Description

Group creates a grouped variant of an object of class "data.frame" or of class "data.set", for which methods for `with` and `within` are defined, so that these well-known functions can be applied "groupwise".
Usage

# Create an object of class "grouped.data" from a
data frame or a data set.
Groups(data, by, ...)
## S3 method for class 'data.frame'
Groups(data, by, ...)
## S3 method for class 'data.set'
Groups(data, by, ...)
## S3 method for class 'grouped.data'
Groups(data, by, ...)

# Recombine grouped data into a data frame or a data set
recombine(x, ...)
## S3 method for class 'grouped.data.frame'
recombine(x, ...)
## S3 method for class 'grouped.data.set'
recombine(x, ...)

# Recombine grouped data and coerce the result appropriately:
## S3 method for class 'grouped.data'
as.data.frame(x, ...)
## S4 method for signature 'grouped.data.frame'
as.data.frame(x, row.names=NULL, ...)
## S4 method for signature 'grouped.data.set'
as.data.set(x, row.names=NULL, ...)

# Methods of the generics "with" and "within" for grouped data
## S3 method for class 'grouped.data'
with(data, expr, ...)
## S3 method for class 'grouped.data'
within(data, expr, recombine=FALSE, ...)

# This is equivalent to with(Groups(data, by), expr, ...)
withGroups(data, by, expr, ...)
# This is equivalent to within(Groups(data, by), expr, recombine, ...)
withinGroups(data, by, expr, recombine=TRUE, ...)

Arguments

data  an object of the classes "data.frame", "data.set" if an argument to Groups, withGroups, withinGroups,
by    a formula with the factors the levels of which define the groups.
expr  an expression, or several expressions enclosed in curly braces.
recombine a logical vector; should the resulting grouped data be recombined?
x     an object of class "grouped.data".
row.names an optional character vector with row names.
...    other arguments, ignored.
### Details

When applied to a data frame `Groups` returns an object with class attributes "grouped.data.frame", "grouped.data", and "data.frame", when applied do an object with class "data.set", it returns an object with class attributes "grouped.data.set", "grouped.data", and "data.set".

When applied to objects with class attributed "grouped.data", both the functions `with()` and `within()` evaluate `expr` separately for each group defined by `Groups`. `with()` returns an array composed of the results of `expr`, while `within()` returns a modified copy of its data argument, which will be a "grouped.data" object ("grouped.data.frame" or "grouped.data.set"), unless the argument `recombine=TRUE` is set.

The expression `expr` may contain references to the variables `n_`, `N_`, and `i_`. `n_` is equal to the size of the respective group (the number of rows belonging to it), while `N_` is equal to the total number of observations in all groups. The variable `i_` equals to the indices of the rows belonging to the respective group of observations.

### Examples

```r
some.data <- data.frame(x=rnorm(n=100))
some.data <- within(some.data,
  f <- factor(rep(1:4,each=25),labels=letters[1:4])
  g <- factor(rep(1:5,each=4,5),labels=LETTERS[1:5])
  y <- x + rep(1:4,each=25) + 0.75*rep(1:5,each=4,5)
)

# For demonstration purposes, we create an 'empty' group:
some.data <- subset(some.data,
  f!="a" | g!="C")

some.grouped.data <- Groups(some.data,
  ~f+g)

group.means <- with(some.grouped.data,
  mean(y))
group.means

group.means <- with(some.grouped.data,
  round(mean(y.cent),15))
group.means

# The following demonstrates the use of n_, N_, and i_
# An external copy of y
y1 <- some.data$y
```
group.means.n <- with(some.grouped.data,
    c(mean(y), # Group means for y
      n_, # Group sizes
      sum(y)/n_,# Group means for y
      n_/N_, # Relative group sizes
      sum(y1)/N_, # NOT the grand mean
      sum(y1[i_])/n_)) # Group mean for y1

# Names can be attached to the groupwise results
with(some.grouped.data,
    c(Centered=round(mean(y.cent),15),
      Uncentered=mean(y)))

some.data.ungrouped <- recombine(some.grouped.data)
str(some.data.ungrouped)

# It all works with "data.set" objects
some.dataset <- as.data.set(some.data)
some.grouped.dataset <- Groups(some.dataset,-f+g)

with(some.grouped.dataset,
    c(Mean=mean(y),
      Variance=var(y)))

# The following two expressions are equivalent:
with(Groups(some.data,-f+g),mean(y))
withGroups(some.data,-f+g,mean(y))

# The following two expressions are equivalent:
some.data <- within(Groups(some.data,-f+g),{
    y.cent <- y - mean(y)
    y.cent.1 <- y - sum(y)/n_}
  )

some.data <- withinGroups(some.data,-f+g,{
    y.cent <- y - mean(y)
    y.cent.1 <- y - sum(y)/n_}
  )

# Both variants of groupwise centred varaibles should
# have zero groupwise means:
withGroups(some.data,-f+g,{
    c(round(mean(y.cent),15),
      round(mean(y.cent.1),15))
  })
Description

The functions described here form building blocks for the `format_html` methods functions for `codebook`, `ftable`, `ftable_matrix`, and `mtable` objects, etc.

The most basic of these functions is `html`, which constructs an object that represents a minimal piece of HTML code and is member of the class "html_elem". Unlike a character string containing HTML code, the resulting code element can relatively easily modified using other functions presented here. The actual code is created when the function `as.character` is applied to these objects.

Longer sequences of HTML code can be prepared by concatenating them with `c`, or by `html_group`, or by applying `as.html_group` to a list of "html_elem" objects. All these result in objects of class "html_group".

Attributes (such as class, id etc.) of HTML elements can be added to the call to `html`, but can also later recalled or modified with `attribs` or `setAttribs`. An important attribute is the style attribute, which can contain CSS styling. It can be recalled or modified with `style` or `setStyle`. Styling strings can also be created with `html_style` or `as.css`.

Usage

```r
html(tag, ..., .content = NULL, linebreak = FALSE)
html_group(...) 
as.html_group(x)

c(t)
c(t)<-value
setContent(t,value)

attribs(t)
attribs(t)<-value
setAttribs(t,...)
## S3 method for class 'character'
setAttribs(t,...)
## S3 method for class 'html_elem'
setAttribs(t,...)
## S3 method for class 'html_group'
setAttribs(t,...)

css(...)
as.css(t)
style(t)
style(t) <- value
setStyle(t,...)
## S3 method for class 'character'
setStyle(t,...)
## S3 method for class 'html_elem'
setStyle(t,...)
## S3 method for class 'html_group'
setStyle(t,...)
```
Arguments

tag
a character string that determines the opening and closing tags of the HTML element. (The closing tag is relevant only if the element has a content.)

... optional further arguments, named or not.

For html: named arguments create the attributes of the HTML element, unnamed arguments define the content of the HTML element, i.e. whatever appears between opening and closing tags (e.g. `<p>` and `</p>`). Character strings, "html_elem", or "html_group" objects can appear as content of a HTML element.

For setAttribs: named arguments create the attributes of the HTML element, unnamed arguments are ignored.

For setStyle: named arguments create the styling of the HTML element, unnamed arguments are ignored.

For html_group: several objects of class "html_elem" or "html_group".

For css: named arguments (character strings!) become components of a styling in CSS format.

.content an optional character string, "html_elem", or "html_group" object

linebreak a logical value or vector of length 2, determines whether linebreaks are inserted after the HTML tags.

x an object. For as.html_group, this should be a list of objects of class "html_elem" or "html_group". For content, setContent, attribs, setAttribs, style, setStyle, this should be an object of class "html_elem" or "html_group".

value an object of appropriate class.

For content<-: a character string, "html_elem", or "html_group" object, or a concatenation thereof.

For attribs<- or style<-: a named character vector.

Details

Objects created with html are lists with class attribute "html_elem" and components

tag a character string

attributes a named character vector

content a character vector, an "html_elem" or "html_group" object, or a list of such.

linebreak a logical value or vector of length 2.

Objects created with html_group or by concatenation of "html_elem" or "html_group" object are lists of such objects, with class attribute "html_group".

Examples

html("img")
html("img", src="test.png")
html("div", class="element", id="first", "Sisyphus")
html("div", class="element", id="first", .content="Sisyphus")
div <- html("div",class="element",id="first",linebreak=c(TRUE,TRUE))
content(div) <- "Sisyphus"
div

tag <- html("tag",linebreak=TRUE)
attribs(tag)["class"] <- "something"
attribs(tag)["class"]
tag

style(tag) <- c(color="#342334")
style(tag)
tag

style(tag)["bg"] <- "white"
tag

setStyle(tag,bg="black")
setStyle(tag,c(bg="black"))
c(div,tag,tag)

c(  
c(div,tag),  
c(div,tag,tag)  
)
c(  
c(div,tag),  
div,tag,tag  
)
c(  
div,tag,  
c(div,tag,tag)  
)

content(div) <- c(tag,tag,tag)
div

css("background-color"="black",  
color="white")
as.css(c("background-color"="black",  
color="white"))

Hello <- "Hello World!"
Hello <- html("p",Hello,linebreak=c(TRUE,TRUE))
style(Hello) <- c(color="white",  
"font-size"="40px",  
"font-family"="unknown",  
"font-weight"="normal")
Iconv

Convert Annotations, and Value Labels between Encodings

Description

This function uses the base package function `iconv` to translate variable descriptions (a.k.a variable labels) and value labels of `item`, `data.set`, and `importer` objects into a specified encoding.

It will be useful in UTF-8 systems when data file come in some ancient encoding like 'Latin-1' as long used by Windows systems.

Usage

```r
Iconv(x, from = "", to = "", ...)  
## S3 method for class 'annotation'
Iconv(x, from = "", to = "", ...)  
## S3 method for class 'data.set'
Iconv(x, from = "", to = "", ...)  
## S3 method for class 'importer'
Iconv(x, from = "", to = "", ...)  
## S3 method for class 'item'
Iconv(x, from = "", to = "", ...)  
## S3 method for class 'value.labels'
Iconv(x, from = "", to = "", ...)  
```
**importers**

**Object Oriented Interface to Foreign Files**

**Description**

Importer objects are objects that refer to an external data file. Currently only Stata files, SPSS system, portable, and fixed-column files are supported.

Data are actually imported by 'translating' an importer file into a data.set using as.data.set or subset.

The importer mechanism is more flexible and extensible than read.spss and read.dta of package "foreign", as most of the parsing of the file headers is done in R. It is also adapted to efficiently load large data sets. Most importantly, importer objects support the labels, missing.values, and descriptions, provided by this package.

**Arguments**

- **x**: an object of which attributes are to be re-encoded.
- **from**: a character string describing the original encoding
- **to**: a character string describing the target encoding
- **...**: further arguments, passed to iconv

**Value**

Iconv returns a copy of its first argument with re-encoded attributes.

**See Also**

iconv, iconvlist

**Examples**

```r
## Not run:
# Locate an SPSS 'system' file and get info on variables, their labels etc.
ZA5302 <- spss.system.file("Daten/ZA5302_v6-0-0.sav", to.lower=FALSE)

# Convert labels etc. from 'latin1' to the encoding of the current locale.
ZA5302 <- Iconv(ZA5302, from="latin1")

# Write out the codebook
writelines(as.character(codebook(ZA5302)),
           con="ZA5302-cdbk.txt")

# Write out the description of the variables (their 'variable labels')
writelines(as.character(description(ZA5302)),
           con="ZA5302-description.txt")

## End(Not run)
```
Usage

spss.file(file,...)

spss.fixed.file(file,
columns.file,
varlab.file=NULL,
codes.file=NULL,
missval.file=NULL,
count.cases=TRUE,
to.lower=getOption("spss.fixed.to.lower",FALSE),
iconv=TRUE,
encoded=getOption("spss.fixed.encoding","cp1252")

spss.portable.file(file,
varlab.file=NULL,
codes.file=NULL,
missval.file=NULL,
count.cases=TRUE,
to.lower=getOption("spss.por.to.lower",FALSE),
iconv=TRUE,
encoded=getOption("spss.por.encoding","cp1252")

spss.system.file(file,
varlab.file=NULL,
codes.file=NULL,
missval.file=NULL,
count.cases=TRUE,
to.lower=getOption("spss.sav.to.lower",FALSE),
iconv=TRUE,
encoded=getOption("spss.sav.encoding","cp1252")

Stata.file(file,
icnv=TRUE,
encoded=if(new_format)
getOption("Stata.new.encoding","utf-8")
else getOption("Stata.old.encoding","cp1252")

## The most important methods for "importer" objects are:
## S4 method for signature 'importer'
subset(x, subset, select, drop = FALSE, ...)

## S4 method for signature 'importer'
as.data.set(x,row.names=NULL,optional=NULL,
    compress.storage.modes=FALSE,...)

## S4 method for signature 'importer'
head(x,n=20,...)
## S4 method for signature 'importer'
tail(x,n=20,...)

Arguments

- **file**: character string; the path to the file containing the data
- **...**: Other arguments. `spss.file()` passes them on to `spss.portable.file()` of `spss.system.file()`. Other function ignore further arguments.
- **columns.file**: character string; the path to an SPSS/PSPP syntax file with a `DATA LIST FIXED` statement
- **varlab.file**: character string; the path to an SPSS/PSPP syntax file with a `VARIABLE LABELS` statement
- **codes.file**: character string; the path to an SPSS/PSPP syntax file with a `VALUE LABELS` statement
- **missval.file**: character string; the path to an SPSS/PSPP syntax file with a `MISSING VALUES` statement
- **count.cases**: logical; should cases in file be counted? This takes effect only if the data file does not already contain information about the number of cases.
- **to.lower**: logical; should variable names changed to lower case?
- **iconv**: logical; should strings (in labels and variables) changed into encoding of the platform?
- **encoded**: a character string; the way characters are encoded in the imported file. For the available encoding options see `?iconvlist`.
- **x**: an object that inherits from class "importer".
- **subset**: a logical vector or an expression containing variables from the external data file that evaluates to logical.
- **select**: a vector of variable names from the external data file. This may also be a named vector, where the names give the names into which the variables from the external data file are renamed.
- **drop**: a logical value, that determines what happens if only one column is selected. If TRUE and only one column is selected, subset returns only a single item object and not a data set.
- **row.names**: ignored, present only for compatibility.
- **optional**: ignored, present only for compatibility.
- **compress.storage.modes**: logical value; if TRUE floating point values are converted to integers if possible without loss of information.
- **n**: integer; the number of rows to be shown by head or tail

Details

A call to a 'constructor' for an importer object, that is, `spss.fixed.file`, `spss.portable.file`, `spss.system.file`, or `Stata.file`, causes R to read in the header of the data file and/or the syntax files that contain information about the variables, such as the columns that they occupy (in case of `spss.fixed.file`), variable labels, value labels and missing values.
The information in the file header and/or the accompanying files is then processed to prepare the file for importing. Thus the inner structure of an importer object may well vary according to what type of file is to imported and what additional information is given.

The as.data.set and subset methods for "importer" objects internally use the generic functions seekData, readData, readSlice, and readChunk, which have methods for the subclasses of "importer". These functions are not callable from outside the package, however.

The subset method for "importer" objects reads in the data ‘chunk-wise’ to create the subset of observations if the option "subset.chunk.size" is set to a non-NULL value, e.g. by options(subset.chunk.size=1000). This may be useful in case of very large data sets from which only a tiny subset of observations is needed for analysis.

Since the functions described here are more or less complete rewrite based on the description of the file structure provided by the documentation for PSPP, they are perhaps not as thoroughly tested as the functions in the foreign package, apart from the frequent use by the author of this package.

Value

spss.fixed.file, spss.portable.file, spss.system.file, and Stata.file return, respectively, objects of class "spss.fixed.importer", "spss.portable.importer", "spss.system.importer", "Stata.importer", or "Stata_new.importer", which, by inheritance, are also objects of class "importer". "Stata.importer" is for files in the format of Stata versions up to 12, while "Stata_new.importer" is for files in the newer format of Stata versions from 13.

Objects of class "importer" have at least the following two slots:

\begin{itemize}
\item \text{ptr} \quad \text{an external pointer}
\item \text{variables} \quad \text{a list of objects of class "item.vector" which provides a 'prototype' for the "data.set" set objects returned by the as.data.set and subset methods for objects of class "importer"}
\end{itemize}

The as.data.frame for importer objects does the actual data import and returns a data frame. Note that in contrast to read.spss, the variable names of the resulting data frame will be lower case, unless the importer function is called with to.lower=FALSE. If long variable names are defined (in case of a PSPP/SPSS system file), they take precedence and are \textit{not} coerced to lower case.

See Also

codebook, description, read.spss

Examples

# Extract American National Election Study of 1948
nes1948.por <- unzip(system.file("anes/1948.ZIP",package="memisc"),
                    "NES1948.POR",exdir=tempfile())

# Get information about the variables contained.
nes1948 <- spss.portable.file(nes1948.por)

# The data are not yet loaded:
show(nes1948)
# ... but one can see what variables are present:

description(nes1948)

# Now a subset of the data is loaded:
vote.socdem.48 <- subset(nes1948,
    select=c(
        V480018,
        V480029,
        V480030,
        V480045,
        V480046,
        V480047,
        V480048,
        V480049,
        V480050
    ))

# Let's make the names more descriptive:
vote.socdem.48 <- rename(vote.socdem.48,
    V480018 = "vote",
    V480029 = "occupation.hh",
    V480030 = "unionized.hh",
    V480045 = "gender",
    V480046 = "race",
    V480047 = "age",
    V480048 = "education",
    V480049 = "total.income",
    V480050 = "religious.pref"
)

# It is also possible to do both
# in one step:
# vote.socdem.48 <- subset(nes1948,
#    select=c(
#        vote = V480018,
#        occupation.hh = V480029,
#        unionized.hh = V480030,
#        gender = V480045,
#        race = V480046,
#        age = V480047,
#        education = V480048,
#        total.income = V480049,
#        religious.pref = V480050
#    ))

# We examine the data more closely:

codebook(vote.socdem.48)

# ... and conduct some analyses.
#
t(genTable(percent(vote)~occupation.hh,data=vote.socdem.48))
# We consider only the two main candidates.
vote.socdem.48 <- within(vote.socdem.48,
  truman.dewey <- vote
  valid.values(truman.dewey) <- 1:2
  truman.dewey <- relabel(truman.dewey,
    "VOTED - FOR TRUMAN" = "Truman",
    "VOTED - FOR DEWEY" = "Dewey")
)

summary(truman.relig.glm <- glm((truman.dewey=="Truman")~religious.pref,
  data=vote.socdem.48,
  family="binomial",
  )
)

---

**Description**

Objects of class *item* are data vectors with additional information attached to them like "value labels" and "user-defined missing values" known from software packages like SPSS or Stata.

**Usage**

```r
## The constructor for objects of class "item"
## more convenient than new("item",...)
## S4 method for signature 'numeric'
as.item(x,
  labels=NULL, missing.values=NULL,
  valid.values=NULL, valid.range=NULL,
  value.filter=NULL, measurement=NULL,
  annotation=attr(x,"annotation"), ...)

## S4 method for signature 'character'
as.item(x,
  labels=NULL, missing.values=NULL,
  valid.values=NULL, valid.range=NULL,
  value.filter=NULL, measurement=NULL,
  annotation=attr(x,"annotation"), ...)

## S4 method for signature 'logical'
as.item(x,...)
# x is first coerced to integer,
# arguments in ... are then passed to the "numeric"
# method.
```
## S4 method for signature 'factor'
as.item(x,...)
## S4 method for signature 'ordered'
as.item(x,...)
## S4 method for signature 'POSIXct'
as.item(x,...)

## S4 method for signature 'double.item'
as.item(x,
  labels=NULL, missing.values=NULL,
  valid.values=NULL, valid.range=NULL,
  value.filter=NULL, measurement=NULL,
  annotation=attr(x,"annotation"), ...)

## S4 method for signature 'integer.item'
as.item(x,
  labels=NULL, missing.values=NULL,
  valid.values=NULL, valid.range=NULL,
  value.filter=NULL, measurement=NULL,
  annotation=attr(x,"annotation"), ...)

## S4 method for signature 'character.item'
as.item(x,
  labels=NULL, missing.values=NULL,
  valid.values=NULL, valid.range=NULL,
  value.filter=NULL, measurement=NULL,
  annotation=attr(x,"annotation"), ...)

## S4 method for signature 'datetime.item'
as.item(x,
  labels=NULL, missing.values=NULL,
  valid.values=NULL, valid.range=NULL,
  value.filter=NULL, measurement=NULL,
  annotation=attr(x,"annotation"), ...)

Arguments

x for as.item methods, any atomic vector; for the as.character, as.factor, as.integer, as.double, a vector with class "item"; for the unique, summary, str, print, [, and <- methods, a vector with class labelled.

labels a named vector of the same mode as x.

missing.values either a vector of the same mode as x, or a list with components "values", vector of the same mode as x (which defines individual missing values) and
"range" a matrix with two rows with the same mode as x (which defines a range of missing values), or an object of class "missing.values".

valid.values either a vector of the same mode as x, defining those values of x that are to be considered as valid, or an object of class "valid.values".

valid.range either a vector of the same mode as x and length 2, defining a range of valid values of x, or an object of class "valid.range".

value.filter an object of class "value.filter", that is, of classes "missing.values", "valid.values", or "valid.range".

measurement level of measurement; one of "nominal", "ordinal", "interval", or "ratio".

annotation a named character vector, or an object of class "annotation"

... further arguments, ignored.

See Also

annotation labels value.filter

Examples

x <- as.item(rep(1:5,4),
  labels=c(
    "First"   = 1,
    "Second" = 2,
    "Third"  = 3,
    "Fourth" = 4,
    "Don't know" = 5
  ),
  missing.values=5,
  annotation = c(
    description="test"
  ))
str(x)
summary(x)
as.numeric(x)

test <- as.item(rep(1:6,2),labels=structure(1:6,
  names=letters[1:6]))
test
test == 1
test != 1
test == "a"
test != "a"
test == c("a","z")
test != c("a","z")
test
test
codebook(test)

Test <- as.item(rep(letters[1:6],2),
  labels=structure(letters[1:6],
...
labels

Test
Test == "a"
Test != "a"
Test == "A"
Test != "A"
Test == c("a","z")
Test != c("a","z")
Test
Test

as.factor(test)
as.factor(Test)
as.numeric(test)
as.character(test)
as.character(Test)
as.data.frame(test)[[1]]

---

value labels

Description

Value labels associate character labels to possible values of an encoded survey item. Value labels are represented as objects of class "value.labels".

Value labels of an item can be obtained using `labels(x)` and can be associated to items and to vectors using `labels(x) <- value`

Value labels also can be updated using the `+` and `-` operators.

Usage

labels(object,...)
labels(x) <- value

Arguments

object any object.
...
further arguments for other methods.
x a vector or "item" object.
value an object of class "value.labels" or a vector that can be coerced into an "value.labels" object or NULL.
Examples

```r
x <- as.item(rep(1:5,4),
  labels=c(
    "First"   = 1,
    "Second"  = 2,
    "Third"   = 3,
    "Fourth"  = 4,
    "Don't know" = 5
  ),
  missing.values=5,
  annotation = c(
    description="test"
  ))
labels(x)
labels(x) <- labels(x) - c("Second"=2)
labels(x)
labels(x) <- labels(x) + c("Second"=2)
labels(x)

puvl <- getOption("print.use.value.labels")
options(print.use.value.labels=FALSE)
x
options(print.use.value.labels=TRUE)
x
options(print.use.value.labels=puvl)
```

List

Create a list and conveniently supply names to its elements

Description

List creates a list and names its elements after the arguments given, in a manner analogously to `data.frame`

Usage

`List(...)`

Arguments

... tagged or untagged arguments from which the list is formed. If the untagged arguments are variables from the enclosing environment, their names become the names of the list elements.

Examples

```r
num <- 1:3
strng <- c("a","b","A","B")
logi <- rep(FALSE,7)
List(num,strng,logi)
```
**Mean**

*Convenience wrappers for common statistical functions*

**Description**

Mean(), Median(), etc. are mere wrappers of the functions mean(), median(), etc. with the na.rm=optional argument set TRUE by default.

**Usage**

Mean(x, na.rm=TRUE, ...)
Median(x, na.rm=TRUE, ...)
Min(x, na.rm=TRUE, ...)
Max(x, na.rm=TRUE, ...)
Weighted.Mean(x, w, ..., na.rm = TRUE)
Var(x, na.rm=TRUE, ...)
StdDev(x, na.rm=TRUE, ...)

Cov(x, y = NULL, use = "pairwise.complete.obs", ...)
Cor(x, y = NULL, use = "pairwise.complete.obs", ...)
Range(..., na.rm = TRUE, finite = FALSE)

**Arguments**

x a (numeric) vector.
y a (numeric) vector or NULL.
w a (numeric) vector of weights.
na.rm a logical value, see mean.
use a character string, see cor.
... other arguments, passed to the wrapped functions.
finite a logical value, see range.

---

**measurement**

*Levels of Measurement of Survey Items*

**Description**

The measurement level of a "item" object, which is one of "nominal", "ordinal", "interval", "ratio", determines what happens to it, if it or the data.set containing it is coerced into a data.frame. If the level of measurement level is "nominal", the it will be converted into an (unordered) factor, if the level of measurement is "ordinal", the item will be converted into an ordered vector. If the measurement is "interval" or "ratio", the item will be converted into a numerical vector.
Usage

```r
## S4 method for signature 'item'
measurement(x)
## S4 replacement method for signature 'item'
measurement(x) <- value
## S4 method for signature 'data.set'
measurement(x)
## S4 replacement method for signature 'data.set'
measurement(x) <- value
is.nominal(x)
is.ordinal(x)
is.interval(x)
is.ratio(x)
set_measurement(x,...)
```

Arguments

- `x` an object, usually of class "item".
- `value` for the `item` method, a character string; either "nominal", "ordinal", "interval", or "ratio"; for the `data.set` method, a list of character vectors with variable names, where the names of the list corresponds to a measurement level and and the list elements indicates the variables to which the measurement levels are assigned.
- `...` vectors of variable names, either symbols or character strings, tagged with the intended measurement level.

Value

The `item` method of `measurement(x)` returns a character string, the `data.set` method returns a named character vector, where the name of each element is a variable name and each `is.nominal`, `is.ordinal`, `is.interval`, `is.ratio` return a logical value.

References


See Also

`data.set`, `item`

Examples

```r
vote <- sample(c(1,2,3,8,9), size=30, replace=TRUE)
labels(vote) <- c(Conservatives = 1,
                 Labour = 2,
                 "Liberal Democrats" = 3,
                 "Don't know" = 8,
                 "Answer refused" = 9)
```
### Description

This package collects an assortment of tools that are intended to make work with R easier for the author of this package and are submitted to the public in the hope that they will be also be useful to others.

The tools in this package can be grouped into four major categories:

- Data preparation and management
- Data analysis
- Presentation of analysis results
- Programming

### Data preparation and management

**Survey Items:** memisc provides facilities to work with what users from other packages like SPSS, SAS, or Stata know as ‘variable labels’, ‘value labels’ and ‘user-defined missing values’. In the context of this package these aspects of the data are represented by the "description", "labels", and "missing.values" attributes of a data vector. These facilities are useful, for example, if you work with survey data that contain coded items like vote intention that may have the following structure:

**Question:** “If there was a parliamentary election next tuesday, which party would you vote for?”

1. Conservative Party
2. Labour Party
3. Liberal Democrat Party
4. Scottish Nation Party
5. Plaid Cymru
6. Green Party
7. British National Party
8. Other party
A statistical package like SPSS allows to attach labels like ‘Conservative Party’, ‘Labour Party’, etc. to the codes 1,2,3, etc. and to mark the codes 96, 97, 98, 99 as ‘missing’ and thus to exclude these variables from statistical analyses. Memisc provides similar facilities. Labels can be attached to codes by calls like \texttt{labels(x) <-something} and expanded by calls like \texttt{labels(x) <-labels(x) + something}. Codes can be marked as ‘missing’ by calls like \texttt{missing.values(x) <-something} and \texttt{missing.values(x) <-missing.values(x) + something}.

Memisc defines a class called "data.set", which is similar to the class "data.frame". The main difference is that it is especially geared toward containing survey item data. Transformations of and within "data.set" objects retain the information about value labels, missing values etc. Using \texttt{as.data.frame} sets the data up for R’s statistical functions, but doing this explicitly is seldom necessary. See \texttt{data.set}.

**More Convenient Import of External Data:** Survey data sets are often relative large and contain up to a few thousand variables. For specific analyses one needs however only a relatively small subset of these variables. Although modern computers have enough RAM to load such data sets completely into an R session, this is not very efficient having to drop most of the variables after loading. Also, loading such a large data set completely can be time-consuming, because R has to allocate space for each of the many variables. Loading just the subset of variables really needed for an analysis is more efficient and convenient - it tends to be much quicker. Thus this package provides facilities to load such subsets of variables, without the need to load a complete data set. Further, the loading of data from SPSS files is organized in such a way that all informations about variable labels, value labels, and user-defined missing values are retained. This is made possible by the definition of \texttt{importer} objects, for which a \texttt{subset} method exists. \texttt{importer} objects contain only the information about the variables in the external data set but not the data. The data itself is loaded into memory when the functions \texttt{subset} or \texttt{as.data.set} are used.

**Recoding:** Memisc also contains facilities for recoding survey items. Simple recodings, for example collapsing answer categories, can be done using the function \texttt{recode}. More complex recodings, for example the construction of indices from multiple items, and complex case distinctions, can be done using the function \texttt{cases}. This function may also be useful for programming, in so far as it is a generalization of \texttt{ifelse}.

**Code Books:** There is a function \texttt{codebook} which produces a code book of an external data set or an internal "data.set" object. A codebook contains in a conveniently formatted way concise information about every variable in a data set, such as which value labels and missing values are defined and some univariate statistics.

An extended example of all these facilities is contained in the vignette "anes48", and in \texttt{demo(anes48)}

**Data Analysis**

**Tables and Data Frames of Descriptive Statistics:** \texttt{genTable} is a generalization of \texttt{xtabs}: Instead of counts, also descriptive statistics like means or variances can be reported conditional on levels of factors. Also conditional percentages of a factor can be obtained using this function. In addition an \texttt{Aggregate} function is provided, which has the same syntax as \texttt{genTable}, but gives a data frame of descriptive statistics instead of a table object.
**Per-Subset Analysis:** By is a variant of the standard function by: Conditioning factors are specified by a formula and are obtained from the data frame the subsets of which are to be analysed. Therefore there is no need to attach the data frame or to use the dollar operator.

**Presentation of Results of Statistical Analysis**

**Publication-Ready Tables of Coefficients:**
Journals of the Political and Social Sciences usually require that estimates of regression models are presented in the following form:

```
Model 1      Model 2      Model 3
Coefficients
(Intercept)  30.628***  6.360***  28.566***
            (7.409)     (1.252)     (7.355)
pop15       -0.471**   -0.461**
            (0.147)     (0.145)
pop75       -1.934      -1.691
            (1.041)     (1.084)
dpi         0.001       -0.000
            (0.001)     (0.001)
ddpi        0.529*      0.410*
            (0.210)     (0.196)
```

**Summaries**

```
R-squared  0.262      0.162      0.338
adj. R-squared  0.230    0.126     0.280
N          50         50        50
```

Such tables of coefficient estimates can be produced by `mtable`. To see some of the possibilities of this function, use `example(mtable)`.

**\LaTeX** **Representation of R Objects:** Output produced by `mtable` can be transformed into \LaTeX tables by an appropriate method of the generic function `toLatex` which is defined in the package `utils`. In addition, `memisc` defines `toLatex` methods for matrices and `ftable` objects. Note that results produced by `genTable` can be coerced into `ftable` objects. Also, a default method for the `toLatex` function is defined which coerces its argument to a matrix and applies the matrix method of `toLatex`.

**Programming**

**Looping over Variables:** Sometimes users want to contruct loops that run over variables rather than values. For example, if one wants to set the missing values of a battery of items. For this purpose, the package contains the function `foreach`. To set 8 and 9 as missing values for the items `knowledge1`, `knowledge2`, `knowledge3`, one can use

```
foreach(x=c(knowledge1,knowledge2,knowledge3),
       missing.values(x) <- 8:9)
```
Changing Names of Objects and Labels of Factors: R already makes it possible to change the names of an object. Substituting the names or dimnames can be done with some programming tricks. This package defines the function rename, dimrename, colrename, and rowrename that implement these tricks in a convenient way, so that programmers (like the author of this package) need not reinvent the weel in every instance of changing names of an object.

Dimension-Preserving Versions of lapply and sapply: If a function that is involved in a call to sapply returns a result an array or a matrix, the dimensional information gets lost. Also, if a list object to which lapply or sapply are applied have a dimension attribute, the result looses this information. The functions Lapply and Sapply defined in this package preserve such dimensional information.

Combining Vectors and Arrays by Names: The generic function collect collects several objects of the same mode into one object, using their names, rownames, colnames and/or dimnames. There are methods for atomic vectors, arrays (including matrices), and data frames. For example

```r
a <- c(a=1,b=2)
b <- c(a=10,c=30)
collect(a,b)
```

leads to

```
x y
a 1 10
b 2 NA
c NA 30
```

Reordering of Matrices and Arrays: The memisc package includes a reorder method for arrays and matrices. For example, the matrix method by default reorders the rows of a matrix according the results of a function.

### Deprecated Functions in Package memisc

**Description**

These functions are provided for compatibility with older versions of memisc only, and may be defunct as soon as the next release.

**Usage**

```r
fapply(formula,data,...) # calls UseMethod("fapply",data)
## Default S3 method:
fapply(formula, data, subset=NULL,
   names=NULL, addFreq=TRUE,...)
```
Arguments

- `formula`: a formula. The right hand side includes one or more grouping variables separated by `+`. These may be factors, numeric, or character vectors. The left hand side may be empty, a numerical variable, a factor, or an expression. See details below.
- `data`: an environment or data frame or an object coercable into a data frame.
- `subset`: an optional vector specifying a subset of observations to be used.
- `names`: an optional character vector giving names to the result(s) yielded by the expression on the left hand side of `formula`. This argument may be redundant if the left hand side results in a named vector. (See the example below.)
- `addFreq`: a logical value. If TRUE and `data` is a table or a data frame with a variable named "Freq", a call to `table`, `Table`, `percent`, or `nvalid` is supplied by an additional argument `Freq` and a call to table is translated into a call to `Table`.
- `...`: further arguments, passed to methods or ignored.

mtable

Comparative Table of Model Estimates

Description

`mtable` produces a table of estimates for several models.

Usage

```r
mtable(..., coef.style=getOption("coef.style"),
       summary.stats=TRUE,
       signif.symbols=getOption("signif.symbols"),
       factor.style=getOption("factor.style"),
       show.baselevel=getOption("show.baselevel"),
       baselevel.sep=getOption("baselevel.sep"),
       getSummary=eval.parent(quote(getSummary)),
       float.style=getOption("float.style"),
       digits=min(3,getOption("digits")),
       sdigits=digits,
       show.eqnames=getOption("mtable.show.eqnames",NA),
       gs.options=NULL
)
```

### S3 method for class 'memisc_mtable'

```r
relabel(x, ..., gsub = FALSE, fixed = !gsub, warn = FALSE)
```

### S3 method for class 'memisc_mtable'

```r
format(x,target=c("print","LaTeX","HTML","delim"),
       ...
)
```
## S3 method for class 'memisc_mtable'
print(x,
center.at=getOption("OutDec"),
topsep="="bottomsep="="sectionsep="-",...)

write.mtable(object,file="",
format=c("delim","LaTeX","HTML"),...)

## S3 method for class 'memisc_mtable'
toLatex(object,...)

### Arguments
...

as argument to mtable: several model objects, e.g. of class lm; as argument
to print.memisc_mtable, toLatex.memisc_mtable, write.memisc_mtable:
further arguments passed to format.memisc_mtable; as argument to format.memisc_mtable:
further arguments passed to format.default; as argument to relabel.memisc_mtable:
further arguments passed to dimrename.

coef.style a character string which specifies the style of coefficient values, whether stan-
dard errors, Wald/t-statistics, or significance levels are reported, etc. See coef.style.

summary.stats if FALSE, no summary statistics are reported. If TRUE then for each object in... either all summary statistics are reported, or those specified by the option "summary.stats.<cls>", where <cls> is the class of the respective object. This argument may also contain a character vector with the names of the summary statistics to report, or a list of character vectors with names of summary statistics for each object passed as argument in ....

signif.symbols a named numeric vector to specify the "significance levels" and corresponding symbols. The numeric elements define the significance levels, the attached names define the associated symbols.

factor.style a character string that specifies the style in which factor contrasts are labeled. See factor.style.

show.baselevel logical; determines whether base levels of factors are indicated for dummy co-
efficients

baselevel.sep character that is used to separate the base level from the level that a dummy variable represents

getSummary a function that computes model-related statistics that appear in the table. See getSummary.

float.style default format for floating point numbers if no format is specified by coef.style.

digits number of significant digits if not specified by the template returned from getCoefTemplate 
getSummaryTemplate

digits integer; number of digits after decimal dot for summary statistics.

show.eqnames logical; if TRUE, left-hand sides of equations are (always) shown in the table header; if FALSE, left-hand sides of equations are not shown; if NA, left-hand sides of equations are shown only if left-hand sides differ among models or one of the models has multiple equations.
gs.options         an optional list of arguments passed on to getSummary
x, object         an object of class mtable
gsub, warn, fixed logical values, see relabel
target           a character string which indicates the target format. Currently the targets "print" (see mtable_format_print), "LaTeX" (see mtable_format_latex), "HTML" (see mtable_format_html), and "delim" (see mtable_format_delim) are supported.
center.at         a character string on which resulting values are centered. Typically equal to ".". This is the default when forLaTeX==TRUE. If NULL, reported values are not centered.
topsep            a character string that is recycled to a top rule.
bottomsep         a character string that is recycled to a bottom rule.
sectionsep        a character string that is recycled to separate coefficients from summary statistics.
file              name of the file where to write to; defaults to console output.
format            character string that specifies the desired format.

Details
mtable constructs a table of estimates for regression-type models. format.memisc_mtable formats suitable for use with output or conversion functions such as print.memisc_mtable, toLatex.memisc_mtable, or write.memisc_mtable.

Value
A call to mtable results in an object of class "mtable" with the following components:

   coefficients a list that contains the model coefficients,
   summaries    a matrix that contains the model summaries,
   calls         a list of calls that created the model estimates being summarised.

Examples

#### Basic workflow

```r
lm0 <- lm(sr ~ pop15 + pop75, data = LifeCycleSavings)
lm1 <- lm(sr ~ dpi + ddpi, data = LifeCycleSavings)
lm2 <- lm(sr ~ pop15 + pop75 + dpi + ddpi, data = LifeCycleSavings)

options(summary.stats.lm=c("R-squared","N"))
mtable("Model 1"=lm0,"Model 2"=lm1,"Model 3"=lm2)

options(summary.stats.lm=c("sigma","R-squared","N"))
mtable("Model 1"=lm0,"Model 2"=lm1,"Model 3"=lm2)

options(summary.stats.lm=NULL)
```
mtable123 <- mtable("Model 1"=lm0,"Model 2"=lm1,"Model 3"=lm2,
    summary.stats=c("sigma","R-squared","F","p","N"))

(mtable123 <- relabel(mtable123,
    "(Intercept)" = "Constant",
    pop15 = "Percentage of population under 15",
    pop75 = "Percentage of population over 75",
    dpi = "Real per-capita disposable income",
    ddpi = "Growth rate of real per-capita disp. income"
))

# This produces output in tab-delimited format:
write.mtable(mtable123)

## Not run:
# This produces output in tab-delimited format:
file123 <- "mtable123.txt"
write.mtable(mtable123,file=file123)
file.show(file123)
# The contents of this file can be pasted into Word
# and converted into a Word table.

## End(Not run)

## Not run: texfile123 <- "mtable123.tex"
write.mtable(mtable123,format="LaTeX",file=texfile123)
file.show(texfile123)
## End(Not run)

#### Examples with UC Berkeley data

berkeley <- Aggregate(Table(Admit,Freq)~.,data=UCBAdmissions)
berk0 <- glm(cbind(Admitted,Rejected)~1,data=berkeley,family="binomial")
berk1 <- glm(cbind(Admitted,Rejected)~Gender,data=berkeley,family="binomial")
berk2 <- glm(cbind(Admitted,Rejected)~Gender+Dept,data=berkeley,family="binomial")
mtable(berk0,summary.stats=c("Deviance","N"))
mtable(berk1,summary.stats=c("Deviance","N"))
mtable(berk0,berk1,berk2,summary.stats=c("Deviance","N"))
mtable(berk0,berk1,berk2,
    coef.style="horizontal",
    summary.stats=c("Deviance","AIC","N"))
mtable(berk0,berk1,berk2,
    coef.style="stat",
    summary.stats=c("Deviance","AIC","N"))
mtable(berk0,berk1,berk2,
    coef.style="ci",
    summary.stats=c("Deviance","AIC","N"))
mtable(berk0,berk1,berk2,
coef.style="ci.se",
summary.stats=c("Deviance","AIC","N"))

mtable(berk0,berk1,berk2,
coef.style="ci.se.horizontal",
summary.stats=c("Deviance","AIC","N"))

mtable(berk0,berk1,berk2,
coef.style="ci.p.horizontal",
summary.stats=c("Deviance","AIC","N"))

mtable(berk0,berk1,berk2,
coef.style="ci.horizontal",
summary.stats=c("Deviance","AIC","N"))

mtable(berk0,berk1,berk2,
coef.style="all",
summary.stats=c("Deviance","AIC","N"))

mtable(berk0,berk1,berk2,
coef.style="all.nostar",
summary.stats=c("Deviance","AIC","N"))

mtable(by(berkeley,berkeley$Dept,
function(x)glm(cbind(Admitted,Rejected)~Gender,
data=x,family="binomial")),
summary.stats=c("Likelihood-ratio","N"))

mtable(By(~Gender,
glm(cbind(Admitted,Rejected)~Dept,
data=berkeley),
family="binomial"),
summary.stats=c("Likelihood-ratio","N"))

berkfull <- glm(cbind(Admitted,Rejected)~Dept/Gender - 1,
data=berkeley,family="binomial")
relabel(mtable(berkfull),Dept="Department",gsub=TRUE)

### Array-like semantics

mtable123 <- mtable("Model 1"=lm0,"Model 2"=lm1,"Model 3"=lm2,
summary.stats=c("sigma","R-squared","F","p","N"))

dim(mtable123)
dimnames(mtable123)
mtable123[c("dpi","ddpi"),
c("Model 2","Model 3")]

### Concatention

mt01 <- mtable(lm0,lm1,summary.stats=c("R-squared","N"))
mt12 <- mtable(lm1,lm2,summary.stats=c("R-squared","F","N"))
c(mt01,mt12) # not that this makes sense, but ...
c("Group 1"=mt01,
"Group 2"=mt12)
**mtable_format_delim**  
Format for ‘mtable’ Objects for Writing into File

**Description**

mtable_mtable_print formats ‘mtable’ in a way suitable for output into a file with write.table.

**Usage**

mtable_format_delim(x,  
colsep="\t",  
rowsep="\n",  
interaction.sep = " x ",  
...  
)

**Arguments**

- **x** an object of class mtable
- **colsep** a character string which separates the columns in the output.
- **rowsep** a character string which separates the rows in the output.
- **interaction.sep** a character string that separates factors that are involved in an interaction effect
- ... further arguments, ignored.

**Value**

A character string.

---

**mtable_format_html**  
HTML Formatting for ‘mtable’ Results

**Description**

These functions formats ‘mtable’ objects into HTML format.

**Usage**

mtable_format_html(x,  
interaction.sep = NULL,  
toprule=2,midrule=1,bottomrule=2,  
split.dec=TRUE,  
style=mtable_format_stdstyle,  
margin="2ex auto",  
...  
)
## S3 method for class 'memisc_mtable'

format_html(x,
            interaction.sep = NULL,
            toprule=2,midrule=1,bottomrule=2,
            split.dec=TRUE,
            style=mtable_format_stdstyle,
            margin="2ex auto",
            sig.notes.style=c(width="inherit"),
            ...)

Arguments

- **x**: an object of class mtable
- **toprule**: integer; thickness in pixels of rule at the top of the table.
- **midrule**: integer; thickness in pixels of rules within the table.
- **bottomrule**: integer; thickness in pixels of rule at the bottom of the table.
- **interaction.sep**: a character string that separates factors that are involved in an interaction effect or NULL. If NULL then a reasonable default is used (either a unicode character or an ampersand encoded HTML entity).
- **split.dec**: logical; whether numbers should be centered at the decimal point by splitting the table cells.
- **style**: string containing default the CSS styling.
- **margin**: character string, determines the margin and thus the position of the HTML table.
- **sig.notes.style**: a character vector with named elements, allows extra styling of the p-values notes at the bottom of the table.
- **...**: further arguments, ignored.

Value

A character string with code suitable for inclusion into a HTML-file.

Examples

```r
lm0 <- lm(sr ~ pop15 + pop75, data = LifeCycleSavings)
lm1 <- lm(sr ~ dpi + ddpi, data = LifeCycleSavings)
lm2 <- lm(sr ~ pop15 + pop75 + dpi + ddpi, data = LifeCycleSavings)

mtable123 <- mtable("Model 1"=lm0,"Model 2"=lm1,"Model 3"=lm2,
                     summary.stats=c("sigma","R-squared","F","p","N"))

(mtable123 <- relabel(mtable123,
```
"(Intercept)" = "Constant",
pop15 = "Percentage of population under 15",
pop75 = "Percentage of population over 75",
dpi = "Real per-capita disposable income",
ddpi = "Growth rate of real per-capita disp. income"
}

# Use HTML entity '&minus;' for minus sign
options(html.use.ampersand=TRUE)
show_html(mtable123)
show_html(mtable123[1:2],
sig.notes.style=width("30ex"))

# Use unicode for minus sign (default)
options(html.use.ampersand=FALSE)
show_html(mtable123)

---

**mtable_format_latex**  
Format 'mtable' Results for LaTeX

**Description**

This function formats objects created by mtable for inclusion into LaTeX files.

**Usage**

```r
mtable_format_latex(x,
useDcolumn=getOption("useDcolumn",TRUE),
colspec=if(useDcolumn)
    paste("D{.}{LaTeXdec}{,}{ddigits,}\"",sep="\")
else "l",
LaTeXdec="",
ddigits=min(3,getOption("digits")),
useBooktabs=getOption("useBooktabs",TRUE),
toprule=if(useBooktabs) "\toprule" else "\hline\hline",
midrule=if(useBooktabs) "\midrule" else "\hline",
cmidrule=if(useBooktabs) "\cmidrule" else "\cline",
bottomrule=if(useBooktabs) "\bottomrule" else "\hline\hline",
interaction.sep = " \$\times\$ ",
sdigits=min(1,ddigits),
compact=FALSE,
sumry.multicol=FALSE,
escape.tex=getOption("toLatex.escape.tex",FALSE),
signif.notes.type=getOption("toLatex.signif.notes.type","include"),
signif.notes.spec=getOption("toLatex.signif.notes.spec","p{.5\linewidth}"),
...)
```
Arguments

\begin{itemize}
  \item \texttt{x} an object of class \texttt{mtable}
  \item \texttt{useDcolumn} should the \texttt{dcolumn} LaTeX package be used? If true, you will have to include \texttt{\usepackage{dcolumn}} into the preamble of your LaTeX document.
  \item \texttt{colspec} LaTeX table column format specifier(s).
  \item \texttt{LaTeXdec} the decimal point in the final LaTeX output.
  \item \texttt{ddigits} alignment specification or digits after the decimal point.
  \item \texttt{useBooktabs} should the \texttt{booktabs} LaTeX package be used? If true, you will have to include \texttt{\usepackage{booktabs}} into the preamble of your LaTeX document.
  \item \texttt{toprule} appearance of the top border of the LaTeX \texttt{tabular} environment.
  \item \texttt{midrule} how are coefficients and summary statistics separated in the LaTeX \texttt{tabular} environment.
  \item \texttt{cmidrule} appearance of rules under section headings.
  \item \texttt{bottomrule} appearance of the bottom border of the LaTeX \texttt{tabular} environment.
  \item \texttt{interaction.sep} a character string that separates factors that are involved in an interaction effect
  \item \texttt{sdigits} integer; number of digits after decimal dot for summary statistics.
  \item \texttt{compact} logical; should the table be compact, without extra columns between multi-equation models?
  \item \texttt{sumry.multicol} logical, should summaries enclosed into \texttt{\multicol} commands?
  \item \texttt{escape.tex} logical, should symbols $, \_ , and ^ be escaped with backslashes?
  \item \texttt{signif.notes.type} character string; should be either "include","append", "drop", or "tnotes". If "append", (very simple) LaTeX code is appended that contains notes that relate significance symbols to p-values. If "include", the LaTeX table will include a (multi-column) cell with these notes. If "drop", notes will not be added. If "tnotes", the exported LaTeX table is wrapped in a \texttt{threeparttable} environment and the p-value notes are wrapped in a \texttt{tablenotes} environment. This requires the LaTeX package \texttt{threeparttable} in order to work.
  \item \texttt{signif.notes.spec} character string; specifies format of cells that include notes about p-values; relevant only if \texttt{signif.notes.type="include"}
  \item \texttt{...} further arguments, ignored.
\end{itemize}

Value

A character string with code suitable for inclusion into a LaTeX-file.
mtable_format_print

Print Format for 'mtable' Objects

Description

mtable_format_print formats 'mtable' in a way suitable for screen output with 'print'.

Usage

mtable_format_print(x,
topsep="=",
bottomsep="=",
sectionsep="-",
interaction.sep = " x ",
center.at=getOption("OutDec"),
align.integers=c("dot","right","left"),
padding = " ",
...)

Arguments

x       an object of class mtable
topsep   a character string that is recycled to a top rule.
bottomsep a character string that is recycled to a bottom rule.
sectionsep a character string that is recycled to separate coefficients from summary statist-
interaction.sep a character string that separates factors that are involved in an interaction effect
center.at a character string on which resulting values are centered. Typically equal to ".". This is the default when forLaTeX=TRUE. If NULL, reported values are not centered.
align.integers how to align integer values.
padding a character string, usually whitespace, used to insert left- and right-padding of table contents.
... further arguments, ignored.

Value

A character string.
negative match  

**Negative Match**

**Description**

%nin% is a convenience operator: \( x \ %nin\% \) table is equivalent to \(! (x \ %in\% \) table\).

**Usage**

\( x \ %nin\% \) table

**Arguments**

- \( x \): the values to be matched
- \( \text{table} \): a values to be match against

**Value**

A logical vector

**Examples**

```r
x <- sample(1:6, 12, replace=TRUE)
x %in% 1:3
x %nin% 1:3
```

---

**percent**  

**Table of Percentages with Percentage Base**

**Description**

percent returns a table of percentages along with the percentage base. It will be useful in conjunction with Aggregate or genTable.

**Usage**

```r
percent(x,...)
```  

---

## Default S3 method:

```r
percent(x,weights=NULL,total=! (se || ci),
       se=FALSE,ci=FALSE,ci.level=.95,
       total.name="N",perc.label="Percentage",...)
```

## S3 method for class 'logical'

```r
percent(x,weights=NULL,total=! (se || ci),
       se=FALSE,ci=FALSE,ci.level=.95,
       total.name="N",perc.label="Percentage",...)
```
percent

Arguments

- **x**: a numeric vector or factor.
- **weights**: an optional numeric vector of weights of the same length as `x`.
- **total**: logical; should the total sum of counts from which the percentages are computed be included into the output?
- **se**: logical; should standard errors of the percentages be included?
- **ci**: logical; should confidence intervals of the percentages be included?
- **ci.level**: numeric; nominal coverage of confidence intervals
- **total.name**: character; name given for the total sum of counts
- **perc.label**: character; label given for the percentages if the table has more than one dimensions, e.g. if `se` or `ci` is `TRUE`.
- **...**: for `percent.mresp`: one or several 1-0 vectors or matrices otherwise, further arguments, currently ignored.

Value

A table of percentages.

Examples

```r
x <- rnorm(100)
y <- rnorm(100)
z <- rnorm(100)
f <- sample(1:3,100,replace=TRUE)
f <- factor(f,labels=c("a","b","c"))

percent(x>0)
percent(f)

genTable(
  cbind(percent(x>0),
       percent(y>0),
       percent(z>0)) ~ f
)

gt <- genTable(
  cbind("x > 0" = percent(x>0,ci=TRUE),
         "y > 0" = percent(y>0,ci=TRUE),
         "z > 0" = percent(z>0,ci=TRUE)) ~ f
)

ftable(gt,row.vars=3:2,col.vars=1)

ex.data <- expand.grid(mean=c(0,25,50),sd=c(1,10,100))[rep(1:9,rep(250,9)),]
ex.data <- within(ex.data,x <- rnorm(n=nrow(ex.data),mean=ex.data$mean,.sd=ex.data$sd))
ex.data <- within(ex.data,x.grp <- cases( x < 0,}
percentages

\[
\begin{align*}
&x \geq 0 & \& x < 50, \\
&x \geq 50 & \& x < 100, \\
&x \geq 100 \\
\end{align*}
\]

genTable(percent(x.grp)~mean+sd,data=ex.data)

Aggregate(percent(Admit,weight=Freq)~Gender+Dept,data=UCBAdmissions)

---

**percentages**  
*Easy Creation of Tables of Percentages*

**Description**

The generic function `percentages` and its methods create one- or multidimensional tables of percentages. As such, the function `percentages` can be viewed as a convenience interface to `prop.table`. However, it also allows to obtain standard errors and confidence intervals.

**Usage**

```r
percentages(obj, ...)  
## S3 method for class 'table'
percentages(obj, 
            by=NULL, which=NULL, se=FALSE, ci=FALSE, ci.level=.95, ...)
## S3 method for class 'formula'
percentages(obj, 
            data=parent.frame(), weights=NULL, ...)
## S3 method for class 'percentage.table'
as.data.frame(x, ...)
## S3 method for class 'xpercentage.table'
as.data.frame(x, ...)
```

**Arguments**

- **obj**: an object; a contingency table or a formula. If it is a formula, its left-hand side determines the factor or combination of factors for which percentages are computed while its right-hand side determines the factor or combination of factors that define the groups within which percentages are computed.
- **by**: a character vector with the names of the factor variables that define the groups within which percentages are computed. Percentages sum to 100 within combination of levels of these factors.
- **which**: a character vector with the names of the factor variables for which percentages are computed.
- **se**: a logical value; determines whether standard errors are computed.
- **ci**: a logical value; determines whether confidence intervals are computed. Note that the confidence intervals are for infinite (or very large) populations.
- **ci.level**: a numerical value, the required confidence level of the confidence intervals.
data  a contingency table (an object that inherits from "table") or a data frame or an object coercable into a data frame.
weights an optional vector of weights. Should be NULL or a numeric vector.
x     an object coerced into a data frame.
...  Further arguments, ignored.

Value
An array that inherits classes "percentage.table" and "table". If percentages was called with se=TRUE or ci=TRUE then the result additionally inherits class "xpercentage.table".

Examples

# Two equivalent ways to create the same table
100*prop.table(UCBAdmissions)
percentages(UCBAdmissions)

# Three equivalent ways to create the same table
100*prop.table(UCBAdmissions,c(2,3))
(p0 <- percentages(UCBAdmissions,by=c("Gender","Dept")))
percentages(UCBAdmissions,which="Admit")

# Percentage table as data frame
as.data.frame(p0)

# Three equivalent ways to create the same table
100*prop.table(margin.table(UCBAdmissions,c(1,2)),2)
percentages(UCBAdmissions,which="Admit",by="Gender")
percentages(Admit~Gender,data=UCBAdmissions)

# Three equivalent ways to create the same table
100*prop.table(margin.table(UCBAdmissions,c(1,3)),2)
percentages(Admit~Dept,data=UCBAdmissions)
percentages(Admit~Dept,data=as.data.frame(UCBAdmissions),
weights=Freq)

# Standard errors and confidence intervals
percentages(Admit~Dept,data=UCBAdmissions,se=TRUE)
percentages(Admit~Dept,data=UCBAdmissions,ci=TRUE)
(p <- percentages(Admit~Dept,data=UCBAdmissions,ci=TRUE,se=TRUE))

# An extended table of percentages as data frame
as.data.frame(p)
Description

The function `query` can be used to search an object for a keyword. The `data.set` and `importer` methods perform such a search through the annotations and value labels of the items in the data set.

Usage

```r
query(x, pattern, ...)
```

## S4 method for signature 'data.set'
query(x, pattern, ...)

## S4 method for signature 'importer'
query(x, pattern, ...)

## S4 method for signature 'item'
query(x, pattern, ...)

# (Called by the methods above.)

Arguments

- `x` an object
- `pattern` a character string that gives the pattern to be searched for
- `...` optional arguments such as
  - `fuzzy` logical, TRUE by default; use fuzzy search via `agrep` or regexp search via `grep`
  - `extended` logical, defaults to FALSE; passed to `grep`
  - `perl` logical, defaults to TRUE; passed to `grep`
  - `fixed` logical, defaults to TRUE; passed to `grep`
  - `ignore.case` logical, defaults to TRUE; passed to `grep` or `agrep`
  - `insertions` numerical value, defaults to 0.999999999; passed to `agrep`
  - `deletions` numerical value, defaults to 0; passed to `agrep`
  - `substitutions` numerical value, defaults to 0; passed to `agrep`

Value

If both the annotation and the value labels of an item match the pattern the `query` method for `item` objects returns a list containing the annotation and the value labels, otherwise if only the annotation or the value labels match the pattern, either the annotation or the value labels are returned, otherwise if neither matches the pattern, `query` returns `NULL`.

The methods of `query` for `data.set` and `importer` objects return a list of all non-`NULL` query results of all items contained by these objects, or `NULL`.

Examples

```r
nes1948.por <- unzip(system.file("anes/NES1948.ZIP",package="memisc"),
                      "NES1948.POR",exdir=tempfile())
nes1948 <- spss.portable.file(nes1948.por)
query(nes1948,"TRUMAN")
```
recode

Recode Items, Factors and Numeric Vectors

Description

recode substitutes old values of a factor or a numeric vector by new ones, just like the recoding facilities in some commercial statistical packages.

Usage

recode(x,..., 
    copy=getOption("recode_copy",identical(otherwise,"copy")), 
    otherwise=NA)

## S4 method for signature 'vector'
recode(x,..., 
    copy=getOption("recode_copy",identical(otherwise,"copy")), 
    otherwise=NA)

## S4 method for signature 'factor'
recode(x,..., 
    copy=getOption("recode_copy",identical(otherwise,"copy")), 
    otherwise=NA)

## S4 method for signature 'item'
recode(x,..., 
    copy=getOption("recode_copy",identical(otherwise,"copy")), 
    otherwise=NA)

Arguments

x

An object

... One or more assignment expressions, each of the form new.value <-old.values.

new.value should be a scalar numeric value or character string. If one of the
new.values is a character string, the return value of recode will be a factor and
each new.value will be coerced to a character string that labels a level of the
factor.

Each old.value in an assignment expression may be a (numeric or character)
vector. If x is numeric such an assignment expression may have the form
new.value <-range(lower,upper) In that case, values between lower and
upper are exchanged by new.value. If one of the arguments to range is min, it
is substituted by the minimum of x. If one of the arguments to range is max, it
is substituted by the maximum of x.

In case of the method for labelled vectors, the tags of arguments of the form
tag = new.value <-old.values will define the labels of the new codes.

If the old.values of different assignment expressions overlap, an error will be
raised because the recoding is ambiguous.

copy logical; should those values of x not given an explicit new code copied into the
resulting vector?
otherwise a character string or some other value that the result may obtain. If equal to NA or "NA", original codes not given an explicit new code are recoded into NA. If equal to "copy", original codes not given an explicit new code are copied.

Details
recode relies on the lazy evaluation mechanism of R: Arguments are not evaluated until required by the function they are given to. recode does not cause arguments that appear in ... to be evaluated. Instead, recode parses the ... arguments. Therefore, although expressions like 1 <-1:4 would cause an error action, if evaluated at any place elsewhere in R, they will not cause an error action, if given to recode as an argument. However, a call of the form recode(x,1=1:4), would be a syntax error.

If John Fox' package "car" is installed, recode will also be callable with the syntax of the recode function of that package.

Value
A numerical vector, factor or an item object.

See Also
recode of package "car".

Examples

x <- as.item(sample(1:6,20,replace=TRUE),
    labels=c( a=1,
             b=2,
             c=3,
             d=4,
             e=5,
             f=6))
print(x)
# A recoded version of x is returned
# containing the values 1, 2, 3, which are
# labelled as "A", "B", "C".
recode(x,
    A = 1 <- range(min,2),
    B = 2 <- 3:4,
    C = 3 <- range(5,max), # this last comma is ignored
)

# This causes an error action: the sets
# of original values overlap.
try(recode(x,
    A = 1 <- range(min,2),
    B = 2 <- 2:4,
    C = 3 <- range(5,max)
))
recode(x,
     A = 1 <- range(min,2),
     B = 2 <- 3:4,
     C = 3 <- range(5,6),
     D = 4 <- 7
   )

# This results in an all-missing vector:
recode(x,
     D = 4 <- 7,
     E = 5 <- 8
   )

f <- as.factor(x)
x <- as.integer(x)

recode(x,
     1 <- range(min,2),
     2 <- 3:4,
     3 <- range(5,max)
   )

# This causes another error action:
# the third argument is an invalid
# expression for a recoding.
try(recode(x,
     1 <- range(min,2),
     3:4,
     3 <- range(5,max)
   ))

# The new values are character strings,
# therefore a factor is returned.
recode(x,
     "a" <- range(min,2),
     "b" <- 3:4,
     "c" <- range(5,6)
   )

recode(x,
     1 <- 1:3,
     2 <- 4:6
   )

recode(x,
     4 <= 7,
     5 <= 8,
     otherwise = "copy"
   )

recode(f,
     "A" <- c("a","b"),
     "B" <- c("c","d"),
     "C" <- c("e","f"),
     otherwise = "copy"
   )
recode

otherwise="copy"
)

recode(f,
    "A" <- c("a","b"),
    "B" <- c("c","d"),
    otherwise="C"
)

recode(f,
    "A" <- c("a","b"),
    "B" <- c("c","d")
)

DS <- data.set(x=as.item(sample(1:6,20,replace=TRUE),
    labels=c( a=1,
              b=2,
              c=3,
              d=4,
              e=5,
              f=6)))

print(DS)

DS <- within(DS,
    xf <- recode(x,
        "a" <- range(min,2),
        "b" <- 3:4,
        "c" <- range(5,6)
    )
    xn <- x@.Data
    xc <- recode(xn,
        "a" <- range(min,2),
        "b" <- 3:4,
        "c" <- range(5,6)
    )
    xc <- as.character(x)
    xcc <- recode(xc,
        1 <- letters[1:2],
        2 <- letters[3:4],
        3 <- letters[5:6]
    )
)

print(DS)

DS <- within(DS,
    xf <- recode(x,
        "a" <- range(min,2),
        "b" <- 3:4,
        "c" <- range(5,6)
    )
    x1 <- recode(x,
        1 <- range(1,2),
        2 <
```
2 <- range(3,4),
copy=TRUE
})
xf1 <- recode(x,
  "A" <- range(1,2),
  "B" <- range(3,4),
copy=TRUE
)
})
)
DS
codebook(DS)

DF <- data.frame(x=rep(1:6,4,replace=TRUE))
DF <- within(DF,{
  xf <- recode(x,
    "a" <- range(min,2),
    "b" <- 3:4,
    "c" <- range(5,6)
  )
x1 <- recode(x,
    1 <- range(1,2),
    2 <- range(3,4),
copy=TRUE
  )
xf1 <- recode(x,
    "A" <- range(1,2),
    "B" <- range(3,4),
copy=TRUE
  )
xf2 <- recode(x,
    "B" <- range(3,4),
    "A" <- range(1,2),
copy=TRUE
  )
})
)}

DF
codebook(DF)
```

---

**relabel**  
*Change labels of factors or labelled objects*

**Description**

Function `relabel` changes the labels of a factor or any object that has a `names`, `labels`, `value.labels`, or `variable.labels` attribute. Function `relabel4` is an (internal) generic which is called by `relabel` to handle S4 objects.
Usage

## Default S3 method:
relabel(x, ..., gsub = FALSE, fixed = TRUE, warn = TRUE)
## S3 method for class 'factor'
relabel(x, ..., gsub = FALSE, fixed = TRUE, warn = TRUE)

## S4 method for signature 'item'
relabel4(x, ...)
# This is an internal method, see details.
# Use relabel(x, ...) for 'item' objects

Arguments

x    An object with a names, labels, value.labels, or variable.labels attribute
...
A sequence of named arguments, all of type character
gsub  a logical value; if TRUE, gsub is used to change the labels of the object. That
       is, instead of substituting whole labels, substrings of the labels of the object can
       changed.
fixed  a logical value, passed to gsub. If TRUE, substitutions are by fixed strings and
        not by regular expressions.
warn   a logical value; if TRUE, a warning is issues if a a change of labels was unsuccess-

Details

This function changes the names or labels of x according to the remaining arguments. If gsub is
FALSE, argument tags are the old labels, the values are the new labels. If gsub is TRUE, arguments
are substrings of the labels that are substituted by the argument values.
Function relabel is S3 generic. If its first argument is an S4 object, it calls the (internal) relabel4
generic function.

Value

The object x with new labels defined by the ...arguments.

Examples

f <- as.factor(rep(letters[1:4],5))
levels(f)
F <- relabel(f,
    a="A",
    b="B",
    c="C",
    d="D"
)
levels(F)
rename

Change Names of a Named Object

Description

rename changes the names of a named object.

Usage

rename(x, ..., gsub = FALSE, fixed = TRUE, warn = TRUE)

Arguments

x Any named object

... A sequence of named arguments, all of type character
gsub

a logical value; if TRUE, `gsub` is used to change the row and column labels of the resulting table. That is, instead of substituting whole names, substrings of the names of the object can changed.

fixed

a logical value, passed to `gsub`. If TRUE, substitutions are by fixed strings and not by regular expressions.

warn

a logical value; should a warning be issued if those names to change are not found?

Details

This function changes the names of `x` according to the remaining arguments. If `gsub` is FALSE, argument tags are the old names, the values are the new names. If `gsub` is TRUE, arguments are substrings of the names that are substituted by the argument values.

Value

The object `x` with new names defined by the ...arguments.

Examples

```r
x <- c(a=1, b=2)
rename(x,a="A",b="B")

str(rename(iris,
           Sepal.Length="Sepal_Length",
           Sepal.Width ="Sepal_Width",
           Petal.Length="Petal_Length",
           Petal.Width ="Petal_Width"
))

str(rename(iris,
           _.=" ",
           .gsub=TRUE))

# Since version 0.99.22 - the following also works:
str(rename(iris,
           Sepal.Length=Sepal_Length,
           Sepal.Width =Sepal_Width,
           Petal.Length=Petal_Length,
           Petal.Width =Petal_Width
))
```

---

**reorder.array**

_**Reorder an Array or Matrix**_

**Description**

`reorder.array` reorders an array along a specified dimension according given names, indices or results of a function applied.
Usage

## S3 method for class 'array'
reorder(x, dim=1, names=NULL, indices=NULL, FUN=mean, ...)

## S3 method for class 'matrix'
reorder(x, dim=1, names=NULL, indices=NULL, FUN=mean, ...)

Arguments

- **x**: An array
- **dim**: An integer specifying the dimension along which x should be ordered.
- **names**: A character vector
- **indices**: A numeric vector
- **FUN**: A function that can be used in apply(x, dim, FUN)
- **...**: further arguments, ignored.

Details

Typical usages are

reorder(x, dim, names)  
reorder(x, dim, indices)  
reorder(x, dim, FUN)

The result of rename(x, dim, names) is x reordered such that dimnames(x)[[dim]] is equal to the concatenation of those elements of names that are in dimnames(x)[[dim]] and the remaining elements of dimnames(x)[[dim]].

The result of rename(x, dim, indices) is x reordered along dim according to indices.

The result of rename(x, dim, FUN) is x reordered along dim according to order(apply(x, dim, FUN)).

Value

The reordered object x.

See Also

The default method of reorder in package stats.

Examples

```r
(M <- matrix(rnorm(n=25),5,5,dimnames=list(LETTERS[1:5],letters[1:5])))
reorder(M, dim=1, names=c("E","A"))
reorder(M, dim=2, indices=3:1)
reorder(M, dim=1)
reorder(M, dim=2)
```
Reshape data frames or data sets

Description

Reshape is a convenience wrapper around reshape with a somewhat simpler syntax.

Usage

Reshape(data,...,id,within_id,drop,direction)

Arguments

data a data frame or data set to be reshaped.

... Further arguments that specify the variables in long and in wide format as well as the time variable. The name tags of the arguments given here specify variable names in long format, the arguments themselves specify the variables in wide format (or observations in long format) and the variable of the "time" variable. The time variable is usually the last of these arguments. An "automatic" time variable can be specified if only a single argument in ... is given.

id a variable name or a concatenation of variable names (either as character strings or as unquoted symbols), that identify individual units. Defaults to "id" or the id variable specified in the "reshapeLong" attribute of the data argument. Needed only if the data are reshaped from long to wide format.

within_id an optional variable name (either as character string or as unquoted symbol), that identifies individual observations on units. Relevant only if the data are reshaped from long to wide format.

drop a variable name or a concatenation of variable names (either as character strings or as unquoted symbols), that specifies the variables to be dropped before reshaping.

direction a character string, should be either equal "long" or "wide".

Examples

exampless.data.wide <- data.frame(
  v = c(35,42),
  x1 = c(1.1,2.1),
  x2 = c(1.2,2.2),
  x3 = c(1.3,2.3),
  x4 = c(1.4,2.4),
  y1 = c(2.5,3.5),
  y2 = c(2.7,3.7),
  y3 = c(2.9,3.9))
exampless.data.wide

# The following two calls are equivalent:
exampless.data.long <- Reshape(data=example.data.wide,
\textbf{Reshape}

\begin{verbatim}
x = c(x1, x2, x3, x4), # N.B. it is possible to # specify 'empty' i.e. missing # measurements y = c(y1, y2, y3,)
t = 1:4, direction = "long")

example.data.long <- Reshape(data = example.data.wide,
  list(
    x = c(x1, x2, x3, x4),
    # N.B. it is possible to
    # specify 'empty' i.e. missing
    # measurements
    y = c(y1, y2, y3,)
  ),
  t = 1:4,
  direction = "long")

example.data.long

# Since the data frame contains an "reshapeLong" attribute # an id variable is already specified and part of the data # frame.
example.data.wide <- Reshape(data = example.data.long,
  x = c(x1, x2, x3, x4),
  y = c(y1, y2, y3,)
  t = 1:4,
  direction = "wide")

example.data.wide

# Here we examine the case where no "reshapeLong" attribute # is present:
example.data.wide <- Reshape(data = example.data.long,
  x = c(x1, x2, x3, x4),
  y = c(y1, y2, y3,)
  t = 1:4,
  id = v,
  direction = "wide")

example.data.wide

# Here, an "automatic" time variable is created. This works # only if there is a single argument other than the data= # and direction= arguments
example.data.long <- Reshape(data = example.data.wide,
  list(
    x = c(x1, x2, x3, x4),
    y = c(y1, y2, y3,)
  ),
  direction = "long")

example.data.long
\end{verbatim}
example.data.wide <- Reshape(data=example.data.long,
   list(
     x=c(x1, x2, x3, x4),
     y=c(y1, y2, y3),
   ),
   direction="wide")

retain Objects in an Environment

Description

retain removes all objects from the environment except those mentioned as argument.

Usage

retain(..., list = character(0), envir = parent.frame(), force=FALSE)

Arguments

... names of objects to be retained, as names (unquoted) or character strings (quoted).
list a character vector naming the objects to be retained.
envir the environment from which the objects are removed that are not to be retained.
force logical value. As a measure of caution, this function removes objects only from local environments, unless force equals TRUE. In that case, retain can also be used to clear the global environment, the user’s workspace.

Examples

local({
   foreach(x=c(a, b, c, d, e, f, g, h), x<-1)
   cat("Objects before call to 'retain':\n")
   print(ls())
   retain(a)
   cat("Objects after call to 'retain':\n")
   print(ls())
})

x <- 1
y <- 2
retain(x)
**sample-methods**

*Take a Sample from a Data Frame-like Object*

**Description**

The methods below are convenience short-cuts to take samples from data frames and data sets. They result in a data frame or data set, respectively, the rows of which are a sample of the complete data frame/data set.

**Usage**

```r
## S4 method for signature 'data.frame'
sample(x, size, replace = FALSE, prob = NULL)
## S4 method for signature 'data.set'
sample(x, size, replace = FALSE, prob = NULL)
## S4 method for signature 'importer'
sample(x, size, replace = FALSE, prob = NULL)
```

**Arguments**

- `x`: a data frame or data set.
- `size`: an (optional) numerical value, the sample size, defaults to the total number of rows of `x`.
- `replace`: a logical value, determines whether sampling takes place with or without replacement.
- `prob`: a vector of sampling probabilities or NULL.

**Value**

A data frame or data set.

**Examples**

```r
for(.i in 1:4)
  print(sample(iris,5))
```

**Sapply**

* A Dimension Preserving Variant of "sapply" and "lapply"

**Description**

Sapply is equivalent to sapply, except that it preserves the dimension and dimension names of the argument `X`. It also preserves the dimension of results of the function `FUN`. It is intended for application to results e.g. of a call to `by`. Lapply is an analog to `lapply` insofar as it does not try to simplify the resulting list of results of `FUN`. 
Usage

Sapply(X, FUN, ..., simplify = TRUE, USE.NAMES = TRUE)
Lapply(X, FUN, ...)

Arguments

X  a vector or list appropriate to a call to sapply.
FUN  a function.
...  optional arguments to FUN.
simplify  a logical value; should the result be simplified to a vector or matrix if possible?
USE.NAMES  logical; if TRUE and if X is character, use X as names for the result unless it had names already.

Value

If FUN returns a scalar, then the result has the same dimension as X, otherwise the dimension of the result is enhanced relative to X.

Examples

berkeley <- Aggregate(Table(Admit,Freq)~.,data=UCBAdmissions)
berktest1 <- By(~Dept+Gender,  
  glm(cbind(Admitted,Rejected)-1,family="binomial"),  
  data=berkeley)
berktest2 <- By(~Dept,  
  glm(cbind(Admitted,Rejected)~Gender,family="binomial"),  
  data=berkeley)
sapply(berktest1,coef)
Sapply(berktest1,coef)
sapply(berktest1,function(x)drop(coef(summary(x))))
Sapply(berktest1,function(x)drop(coef(summary(x))))
sapply(berktest2,coef)
Sapply(berktest2,coef)
sapply(berktest2,function(x)coef(summary(x)))
Sapply(berktest2,function(x)coef(summary(x)))

sort-methods  Convenience Methods to Sort Data Frames and Data Sets

Description

The methods below return a sorted version of the data frame or data set, given as first argument.
Usage

```r
## S3 method for class 'data.frame'
sort(x, decreasing=FALSE, by=NULL, na.last=NA, ...)
## S3 method for class 'data.set'
sort(x, decreasing=FALSE, by=NULL, na.last=NA, ...)
```

Arguments

- `x`: a data frame or data set.
- `decreasing`: a logical value, should sorting be in increasing or decreasing order?
- `by`: a character name of variable names, by which to sort; a formula giving the variables, by which to sort; NULL, in which case, the data frame / data set is sorted by all of its variables.
- `na.last`: for controlling the treatment of 'NA's. If 'TRUE', missing values in the data are put last; if 'FALSE', they are put first; if 'NA', they are removed
- `...`: other arguments, currently ignored.

Value

A sorted copy of `x`.

Examples

```r
DF <- data.frame(
  a = sample(1:2, size=20, replace=TRUE),
  b = sample(1:4, size=20, replace=TRUE)
)
sort(DF)
sort(DF, by=a+b)
sort(DF, by=b+a)
sort(DF, by=c("b","a"))
sort(DF, by=c("a","b"))
```

styles

Formatting Styles for Coefficients, Factor Contrasts, and Summary Statistics

Description

Methods for setting and getting templates for formatting model coefficients and summaries for use in `mtable`.

Usage

```r
setCoefTemplate(...)
getCoefTemplate(style)
getSummaryTemplate(x)
setSummaryTemplate(...)
summaryTemplate(x)
```
Arguments

several tagged arguments; in case of setCoefTemplate the tags specify the
coef.styles, in case of setSummaryTemplate they specify model classes. The
associated values are templates.

style a character string with the name of a coefficient style, if left empty, all coefficient
templates are returned.

x a model or a name of a model class, for example "lm" or "glm"; if left empty,
all summary templates are returned.

Details

The style in which model coefficients are formatted by mtable is by default selected from the
coeff.style setting of options, "factory-fresh" setting being options(coef.style= "default").

The appearance of factor levels in an mtable can be influenced by the factor.style setting of
options. The "factory-fresh" setting is options(factor.style=(f): (l)), where (f) stands for the factor name and (l) stands for the factor level. In case of treatment contrasts,
the baseline level will also appear in an mtable separated from the current factor level by the
baselevel.sep setting of options. The "factory-fresh" setting is options(baselevel.sep="-").

Users may specify additional coefficient styles by a call to setCoefTemplate.

In order to adapt the display of summary statistics of other model classes, users need to set a
template for model summaries via a call to setSummaryTemplate or to define a method of the
generic function summaryTemplate.

Substitute

Substitutions in Language Objects

Description

Substitute differs from substitute in so far as its first argument can be a variable that contains
an object of mode "language". In that case, substitutions take place inside this object.

Usage

Substitute(lang,with)

Arguments

lang any object, unevaluated expression, or unevaluated language construct, such as
a sequence of calls inside braces

with a named list, environment, data frame or data set.

Details

The function body is just do.call("substitute",list(lang,with)).
Value
An object of storage mode "language" or "symbol".

Examples

```r
lang <- quote(sin(x)+z)
substitute(lang, list(x=1, z=2))
Substitute(lang, list(x=1, z=2))
```

Description
The operator `%#%` can be used to attach a description annotation to an object. `%##%` can be used to attach a character vector of annotations to an object. `%@%` returns the attribute with the name given as second argument. With `%@%` it is also possible to assign attributes.

Usage

```r
x `%#%` descr
dx `%##%` annot
dx `%@%` nm
x `%@%` nm <- value
```

Arguments

- `x` an object, usually and item or a vector.
- `descr` a character string
- `annot` a named character vector; its contents are added to the "annotation" attribute of `x`. Existing elements are kept.
- `nm` a character string, the name of the attribute being set or requested.
- `value` any kind of object that can be attached as an attribute.

Examples

```r
test1 <- 1 `%#%` "One"
# This is equivalent to:
# test <- 1
# description(test) <- "One"
description(test1)
# Results in "One"

# Not that it makes sense, but ...
test2 <- 2 `%##%` c(
  Precedessor = 0,
  Successor = 2
)```
Table

One-Dimensional Table of Frequences and/or Percentages

Description

Table is a generic function that produces a table of counts or weighted counts and/or the corresponding percentages of an atomic vector, factor or "item.vector" object. This function is intended for use with Aggregate or genTable. The "item.vector" method is the workhorse of codebook.

Usage

## S4 method for signature 'atomic'
Table(x, weights=NULL, counts=TRUE, percentage=FALSE, ...)
## S4 method for signature 'factor'
Table(x, weights=NULL, counts=TRUE, percentage=FALSE, ...)
## S4 method for signature 'item.vector'
Table(x, weights=NULL, counts=TRUE, percentage=(style="codebook"),
      style=c("table","codebook","nolabels"),
      include.missings=(style="codebook"),
      missing.marker=if(style="codebook") "M" else ",", ...)

Arguments

x an atomic vector, factor or "item.vector" object
counts logical value, should the table contain counts?
percentage logical value, should the table contain percentages? Either the counts or the percentage arguments or both should be TRUE.
style character string, the style of the names or rownames of the table.
weights a numeric vector of weights of the same length as x.
include.missings a logical value; should missing values included into the table?
missing.marker a character string, used to mark missing values in the table (row)names.
... other, currently ignored arguments.

Value

The atomic vector and factor methods return either a vector of counts or vector of percentages or a matrix of counts and percentages. The same applies to the "item.vector" vector method unless include.missing=TRUE and percentage=TRUE, in which case total percentages and percentages of valid values are given.

Examples

```
with(as.data.frame(UCBAdmissions),Table(Admit,Freq))
Aggregate(Table(Admit,Freq)~.,data=UCBAdmissions)
A <- sample(c(1:5,9),size=100,replace=TRUE)
labels(A) <- c(a=1,b=2,c=3,d=4,e=5,dk=9)
missing.values(A) <- 9
Table(A,percentage=TRUE)
```

---

**tibbles**  
*Interface to Packages 'tibble' and 'haven'*

---

**Description**

A as_tibble method (as_table.data.set) allows to transform "data.set" objects into objects of class "tbl_df" as defined by the package "tibble".
as.item methods for objects of classes "haven_labelled" and "have_labelled_spss" allow to transform a "tibble" imported using read_dta, read_spss, etc. from the package "haven" into an object of class "data.set".
as_haven can be used to transform "data.set" objects into objects of class "tbl_df" with that additional information that objects imported using the "haven" package usually have, i.e. variable labels and value labels (as the "label" and "labels" attributes of the columns).

**Usage**

```
as_tibble.data.set(x,...)
## S4 method for signature 'haven_labelled'
as.item(x,...)
## S4 method for signature 'haven_labelled_spss'
as.item(x,...)
as_haven(x,...)
```
to.data.frame

Convert an Array into a Data Frame

to.data.frame converts an array into a data frame, in such a way that a chosen dimensional extent forms variables in the data frame. The elements of the array must be either atomic, data frames with matching variables, or coercable into such data frames.

Usage

```r
  to.data.frame(X, as.vars=1, name="Freq")
```

Arguments

- **X**: an array.
- **as.vars**: a numeric value or a character string. If it is a numeric value then it indicates the dimensional extend which defines the variables. If it is a character string then it is matched against the names of the dimensional extents. This is applicable e.g. if `X` is a contingency table and the dimensional extents are named after the cross-classified factors. Takes effect only if `X` is an atomic array. If `as.vars` equals zero, a new variable is created that contains the values of the array, that is, `to.data.frame` acts on the array `X` like `as.data.frame(as.table(X))`
- **name**: a character string; the name of the variable created if `X` is an atomic array and `as.vars` equals zero.
Value

A data frame.

Examples

berkeley <- Aggregate(Table(Admit,Freq)~.,data=UCBAdmissions)
berktest1 <- By(~Dept+Gender,
glm(cbind(Admitted,Rejected)-1,family="binomial"),
data=berkeley)
berktest2 <- By(~Dept,
glm(cbind(Admitted,Rejected)-Gender,family="binomial"),
data=berkeley)
Stest1 <- Lapply(berktest2,function(x)predict(x,,se.fit=TRUE)[c("fit","se.fit")])
Stest2 <- Sapply(berktest2,function(x)coef(summary(x))
Stest2.1 <- Lapply(berktest1,function(x)predict(x,,se.fit=TRUE)[c("fit","se.fit")])
to.data.frame(Stest1)
to.data.frame(Stest2,as.vars=2)
to.data.frame(Stest2.1)
# Recasting a contingency table
to.data.frame(UCBAdmissions,as.vars="Admit")

Description

Methods for the generic function `toLatex` of package “utils” are provided for generating LaTeX representations of matrices and flat contingency tables (see `ftable`). Also a default method is defined that coerces its first argument into a matrix and applies the matrix method.

Usage

```r
## Default S3 method:
toLatex(object,...)

## S3 method for class 'matrix'
toLatex(object,
    show.titles=TRUE,
    show.vars=FALSE,
    show.xvar=show.vars,
    show.yvar=show.vars,
    digits=if(is.table(object)) 0 else getOption("digits"),
    format="f",
    useDcolumn=getOption("useDcolumn",TRUE),
    colspec=paste("D[.]\{\LaTeXdec\}{\d digits,}\{\,"sep=""}"
    else "r",
    LaTeXdec="."
```
## S3 method for class 'data.frame'
toLatex(object,
digits=getOption("digits"),
format="f",
useDcolumn=getOption("useDcolumn",TRUE),
numeric.colspec=if(useDcolumn) 
  paste("D{.}{LaTeXdec,}{ddigits,}\")
  else "r",
factor.colspec="l",
LaTeXdec=".",
/ddigits=digits,
useBooktabs=getOption("useBooktabs",TRUE),
toprule=if(useBooktabs) "\toprule" else "\hline\hline",
midrule=if(useBooktabs) "\midrule" else "\hline",
cmidrule=if(useBooktabs) "\cmidrule" else "\cline",
bottomrule=if(useBooktabs) "\bottomrule" else "\hline\hline",
toLatex.escape.tex=getOption("toLatex.escape.tex",FALSE),
...)

## S3 method for class 'ftable'
toLatex(object,
show.titles=TRUE,
digits=if(is.integer(object)) 0 else getOption("digits"),
format=if(is.integer(object)) "d" else "f",
useDcolumn=getOption("useDcolumn",TRUE),
colspec=if(useDcolumn) 
  paste("D{.}{LaTeXdec,}{ddigits,}\")
  else "r",
LaTeXdec=".",
/ddigits=digits,
useBooktabs=getOption("useBooktabs",TRUE),
toprule=if(useBooktabs) "\toprule" else "\hline\hline",
midrule=if(useBooktabs) "\midrule" else "\hline",
cmidrule=if(useBooktabs) "\cmidrule" else "\cline",
bottomrule=if(useBooktabs) "\bottomrule" else "\hline\hline",
extrarowsep = NULL,
toLatex.escape.tex=getOption("toLatex.escape.tex",FALSE),
...

## S3 method for class 'ftable_matrix'

```
toLatex(object,
    show.titles=TRUE,
    digits=getOption("digits"),
    format="f",
    useDcolumn=getOption("useDcolumn",TRUE),
    colspec=if(useDcolumn)
        paste("D{.}{LaTeXdec}{d digits,"",sep=""
    else "r",
    LaTeXdec=".",
    ddigits=digits,
    useBooktabs=getOption("useBooktabs",TRUE),
    toprule=if(useBooktabs) \toprule else \hline\hline,
    midrule=if(useBooktabs) \midrule else \hline,
    cmidrule=if(useBooktabs) \cmidrule else \cline,
    bottomrule=if(useBooktabs) \bottomrule else \hline\hline,
    compact=FALSE,
    varontop, varinfront,
    groupsep="3pt",
    grouprule=midrule,
    toLatex.escape.tex=getOption("toLatex.escape.tex",FALSE),
    ...
```

### Arguments

- **object**
  - an *ftable*, a matrix or an object coercable into a matrix.
- **show.titles**
  - logical, should variable names (in case of the *ftable* and *table* methods) or row and column names (in case of the *matrix* method) be appear in the LaTeX code?
- **show.vars, show.xvar, show.yvar**
  - logical, should the names of the dimnames of *object* be shown in the margins of the LaTeX tabular? Such names usually represent the row and/or column variables of a two-dimensional *table*.
- **digits**
  - number of significant digits.
- **format**
  - character containing a format specifier, see *format*.
- **useDcolumn**
  - logical, should the facilities of the *dcolumn* LaTeX package be used? Note that, if TRUE, you will need to include \usepackage{dcolumn} in the preamble of your LaTeX document.
- **colspec**
  - character, LaTeX table column format specifier(s).
- **numeric.colspec**
  - character, LaTeX table column format specifier(s) for numeric vectors in the data frame.
- **factor.colspec**
  - character, LaTeX table column format specifier(s) for factors in the data frame.
- **LaTeXdec**
  - character, the decimal point in the final LaTeX output.
ddigits integer, digits after the decimal point.

useBooktabs logical, should the facilities of the booktabs LaTeX package be used? Note that, if TRUE, you will need to include \usepackage{booktabs} in the preamble of your LaTeX document.

toprule character string, TeX code that determines the appearance of the top border of the LaTeX tabular environment.

midrule character string, TeX code that determines how coefficients and summary statistics are separated in the LaTeX tabular environment.

cmidrule character string, TeX code that determines the appearance of rules under section headings.

bottomrule character string, TeX code that determines the appearance of the bottom border of the LaTeX tabular environment.

extrarowsep character string, extra code to be inserted between the column titles and the table body produced by toLatex.

compact logical, if TRUE, extra column space between sub-tables is suppressed. Defaults to FALSE.

varontop logical, whether names of column variables should appear on top of factor levels.

varinfront logical, whether names of row variables should appear in front of factor levels.

groupsep character string, containing a TeX length; extra vertical space inserted between sub-tables, unless compact is TRUE.

grouprule character string, TeX code that determines how sub-table headings are embellished.

row.names logical, whether row names should be included in exported LaTeX code.

NAas character string, how missing values should be represented.

toLatex.escape.tex logical, should symbols $, \_, and ^ be escaped with backslashes?

... further argument, currently ignored.

Examples

toLatex(diag(5))

toLatex(ftable(UCBAdmissions))

toLatex(rbind(
    ftable(margin.table(UCBAdmissions,c(2,1))),
    ftable(margin.table(UCBAdmissions,c(3,1)))
))
Utility classes

Named Lists, Lists of Items, and Atomic Vectors

Description

The classes "named.list" and "item.list" are merely some 'helper classes' for the construction of the classes "data.set" and "importer".

Class "named.list" extends the basic class "list" by an additional slot "names". Its initialize method assures that the names of the list are unique.

Class "item.list" extends the class "named.list", but does not add any slots. From "named.list" it differs only by the initialize method, which calls that for "named.list" and makes sure that all elements of the list belong to class "item".

Classes "atomic" and "double" are merely used for method selection.

Examples

```
new("named.list",a=1,b=2)
# This should generate an error, since the names
# are not unique.
try(new("named.list",a=1,a=2))

# Another error, one name is missing.
try(new("named.list",a=1,2))

# Also an error, the resulting list would be unnamed.
try(new("named.list",1,2))
```

```
new("item.list",a=1,b=2)
# Also an error: "item.list"s are "named.lists",
# and here the names would be non-unique.
try(new("item.list",a=1,a=2))
```

Value Filters

Description

Value filters, that is objects that inherit from class "value.filter", are a mechanism to distinguish between valid codes of a survey item and codes that are considered to be missing, such as the codes for answers like "don’t know" or "answer refused".

Value filters are optional slot values of "item" objects. They determine which codes of "item" objects are replaced by NA when they are coerced into a vector or a factor.
There are three (sub)classes of value filters: "missing.values", which specify individual missing values and/or a range of missing values; "valid.values", which specify individual valid values (that is, all other values of the item are considered as missing); "valid.range", which specify a range of valid values (that is, all values outside the range are considered as missing). Value filters of class "missing.values" correspond to missing-values declarations in SPSS files, imported by `spss.fixed.file`, `spss.portable.file`, or `spss.system.file`.

Value filters also can be updated using the `+` and `−` operators.

**Usage**

```r
value.filter(x)
missing.values(x)
missing.values(x) <- value
valid.values(x)
valid.values(x) <- value
valid.range(x)
valid.range(x) <- value
is.valid(x)
nvalid(x)
is.missing(x)
include.missings(x, mark="*")
```

**Arguments**

- `x`, `value` objects of the appropriate class.
- `mark` a character string, used to pasted to value labels of `x` (if present).

**Value**

- `value.filter(x)`, `missing.values(x)`, `valid.values(x)`, and `valid.range(x)`, return the value filter associated with `x`, an object of class "value.filter", that is, of class "missing.values", "valid.values", or "valid.range", respectively.
- `is.missing(x)` returns a logical vector indicating for each element of `x` whether it is a missing value or not. `is.valid(x)` returns a logical vector indicating for each element of `x` whether it is a valid value or not. `nvalid(x)` returns the number of elements of `x` that are valid.

For convenience, `is.missing(x)` and `is.valid(x)` also work for atomic vectors and factors, where they are equivalent to `is.na(x)` and `!is.na(x)`. For atomic vectors and factors, `nvalid(x)` returns the number of elements of `x` for which `!is.na(x)` is TRUE.

- `include.missings(x, ...)` returns a copy of `x` that has all values declared as valid.

**Examples**

```r
x <- rep(c(1:4,8,9),2,length=60)
labels(x) <- c(
```
a=1,
b=2,
c=3,
d=4,
dk=8,
refused=9
)
missing.values(x) <- 9
missing.values(x)
missing.values(x) <- missing.values(x) + 8
missing.values(x)
missing.values(x) <- NULL
missing.values(x)
missing.values(x) <- list(range=c(8,Inf))
missing.values(x)
valid.values(x)
print(x)
is.missing(x)
is.valid(x)
as.factor(x)
as.factor(include.missings(x))
as.integer(x)
as.integer(include.missings(x))

---

**view**

A Generic Viewing Function

**Description**

The function `view` provides generic interface to the non-generic function `View`.

In contrast to the implementation of `View` provided by either basic R or RStudio, this function can be extended to handle new kinds of objects by defining `viewPrep` methods for them. Further, `view` can be adapted to other GUIs by specifying the "vfunc" option or the `vfunc=` optional argument.

Internally, `view` uses the generic function `viewPrep` to prepare data so it can be passed on to the (non-generic) function `View` or (optionally) a different graphical user interface function that can be used to display matrix- or data frame-like objects.

The `vfunc` argument determines how the result of `viewPrep` is displayed. Its default is the function `View`, but an alternative is `view_html` which creates and displays an HTML grid.

**Usage**

```r
view(x,
     title=deparse(substitute(x)),
     vfunc=getOption("vfunc","View"),
     ...)
```

# The internal generic, not intended to be used by the end-user.
viewPrep(x,title,...)
## S3 method for class 'data.set'
viewPrep(x,title,...)
## S3 method for class 'data.frame'
viewPrep(x,title,...)
## S3 method for class 'descriptions'
viewPrep(x,title,...)
## S3 method for class 'codeplan'
viewPrep(x,title,compact=FALSE,...)
## S3 method for class 'importer'
viewPrep(x,title,compact=TRUE,...)

### Arguments

- **x**
  - an object, e.g. a data frame, data.set, or importer.
- **title**
  - an optional character string; shown as the title of the display.
- **vfunc**
  - a character string; a name of a GUI function to call with the results of `viewPrep()`
- **compact**
  - a logical value; should the codeplan be shown in a compact form - one line per variable - or in a more expansive form - one line per labelled value?
- **...**
  - further arguments; `view()` passes them on to `viewPrep`.

### Examples

```r
## Not run:
example(data.set)
view(Data)
view(description(Data))
view(codeplan(Data))
# Note that this file is *not* included in the package
# and has to be obtained from GESIS in order to run the
# following
ZA7500sav <- spss.file("ZA7500_v2-0-0.sav")
view(ZA7500sav)
## End(Not run)
```

---

**view_html**

HTML Output for 'view'.

### Description

An alternative to 'View' for use with 'view'.

### Usage

```r
view_html(x,title=deparse(substitute(x)),output,...)
```
Arguments

- **x**
  
  the result of `viewPrep`, a matrix of character strings.

- **title**
  
  an optional character string; shown as the title of the display.

- **output**
  
  a function or the name of a function. It determines how where the HTML code is directed to.

  If the working environment is RStudio, the default value is "file.show". In other interactive environments it is "browser". In non-interactive sessions it is "stdout".

  If output equals "browser" the generated HTML code is shown using `browseURL`.

  If output equals "stdout" the HTML code is written to the console output window. If output equals "file.show", the function `file.show` is used.

  If `view_html` is called within a Jupyter session, the HTML code created is enveloped in a pair of `<div>` tags and included into the Jupyter output.

  ...  
  
  other arguments; ignored.

Examples

```r
## Not run:
example(data.set)
view(Data,vfunc=view_html)

## End(Not run)
```

 wild.codes  

Table of frequencies for unlabelled codes

Description

The function `wild.codes` creates a table of frequencies of those codes of an item that do not have labelled attached to them. This way, it helps to identify coding errors.

Usage

```r
wild.codes(x)
```

## S4 method for signature 'item'

```r
wild.codes(x)
```

Arguments

- **x**
  
  an object of class "item"

Value

A table of frequencies (i.e. an array of class "table")
Add Alternative Variance Estimates to Models Estimates

Description

A simple object-orientation infrastructure to add alternative standard errors, e.g. sandwich estimates or New-West standard errors to fitted regression-type models, such as fitted by \texttt{lm()} or \texttt{glm()}.

Usage

\begin{verbatim}
withSE(object, vcov, ...)
withVCov(object, vcov, ...)

## S3 method for class 'lm'
withVCov(object, vcov, ...)

## S3 method for class 'withVCov'
summary(object, ...)
## S3 method for class 'withVCov.lm'
summary(object, ...)
\end{verbatim}

Arguments

\begin{itemize}
  \item \texttt{object} a fitted model object
  \item \texttt{vcov} a function that returns a variance matrix estimate, a given matrix that is such an estimate, or a character string that identifies a function that returns a variance matrix estimate (e.g. \"HAC\" for \texttt{vcovHAC}).
  \item \ldots further arguments, passed to \texttt{vcov()} or, respectively, to the parent method of \texttt{summary()}
\end{itemize}

Details

Using \texttt{withVCov()} an alternative variance-covariance matrix is attributed to a fitted model object. Such a matrix may be produced by any of the variance estimators provided by the "sandwich" package or any package that extends it.

\texttt{withVCov()} has no consequences on how a fitted model itself is printed or represented, but it does have consequences what standard errors are reported, when the function \texttt{summary()} or the function \texttt{mtable()} is applied.

\texttt{withSE()} is a convenience front-end to \texttt{withVCov()}. It can be called in the same way as \texttt{withVCov()}, but also allows to specify the type of variance estimate by a character string that identifies the function that gives the covariance matrix (e.g. \"OPG\" for \texttt{vcovOPG}).
Value

\texttt{withV Cov} returns a slightly modified model object: It adds an attribute named ".V Cov" that contains the alternate covariance matrix and modifies the class attribute. If e.g. the original model object has class "lm" then the model object modified by \texttt{withV Cov} has the class attribute \texttt{c("withV Cov.lm","withV Cov","lm")}.

Examples

```r
## Generate poisson regression relationship
x <- sin(1:100)
y <- rpois(100, exp(1 + x))
## compute usual covariance matrix of coeffcient estimates
fm <- gl m(y ~ x, family = poisson)

library(sandwich)
fmo <- withV Cov(fm, vcovOPG)
vcov(fm)
vcov(fmo)

summary(fm)
summary(fmo)

mtable(Defau lt=fm,
       OPG=withSE(fm,"OPG"),
       summary.stats=c("Deviance","N")
)

vo <- vcovOPG(fm)

mtable(Defau lt=fm,
       OPG=withSE(fm,vo),
       summary.stats=c("Deviance","N")
)
```

\textit{Write Codebooks and Variable Descriptions into a Text File}

Description

This is a convenience function to facilitate the creation of data set documents in text files.

Usage

\texttt{Write(x,...)}

\texttt{## S3 method for class 'codebook'
Write(x,file=stdout(),...)}

\texttt{## S3 method for class 'descriptions'
Write(x,file=stdout(),...)}
Arguments

x a "codebook" or "descriptions" object.
file a connection, see connections.
... further arguments, ignored or passed on to particular methods.
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