Package ‘CUFF’
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Note  -*- Encoding: utf-8 -*-
Type  Package
Title  Charles's Utility Function using Formula
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Description  Utility functions that provides wrapper to descriptive base functions
             like cor, mean and table. It makes use of the formula interface to pass
             variables to functions. It also provides operators to concatenate (%+%), to
             repeat (%n%) and manage character vectors for nice display.
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Description
This function extract coefficients tables from common statistical model (lm/glm/lme/lmer/t-test) and format them.

Usage
\[
\text{cf}(x, \text{addci = TRUE, pv.style = 1, signif = 2, expcf, ...})
\]

Arguments
\[
x & x \text{ is a lm/glm/lme/lmer/t.test model} \\
\text{addci} & \text{Logical value that tells R to add a 95\% confidence interval to the output. True by default.} \\
\text{pv.style} & \text{Integer specifying the style (1 or 2) of p-value formatting. See help(pv) for details} \\
\text{signif} & \text{Either an integer specifying the number of significant digits or a dimension 3 vector for respectively the estimate, standard error and t-value} \\
\text{expcf} & \text{Logical value that tells R to add exponentiated value of estimate. Set to FALSE except if the model specifies a logistic regression (family = binomial)} \\
\ldots & \text{Not used yet}
\]

Value
Returns a data.frame of formatted characters of the coefficient table.

Author(s)
Charles-Édouard Giguère
Examples

```r
lm1 <- lm(Sepal.Length ~ Species, iris)
cf(lm1)
```

---

### Description

This is a function that sends a table-like object to the clipboard to paste it quickly on an external program.

### Usage

```r
clip(x, sep = "\t", row.names = FALSE, quote = FALSE, ...)
```

### Arguments

- **x**: A table, a matrix or a data.frame to send to clipboard.
- **sep**: Type of separator for the output.
- **row.names**: Logical value (T/F) to include or exclude row names.
- **quote**: Logical value to print or exclude quotation marks.
- **...**: Other arguments passed to `write.table` function.

### Value

No output. The results is printed to the clipboard.

### Author(s)

Charles-Édouard Giguère

---

### correlation

#### Bivariate correlations

**Description**

This is a function that creates correlation matrix objects that can be printed with the corresponding N and p-values. It is a wrapper for cor and cor.test.
correlation

Usage

correlation(x, y = NULL, method = "pearson",
    alternative = "two.sided", exact = NULL,
    use = "pairwise.complete.obs",
    continuity = FALSE, data = NULL)

## S3 method for class 'corr'
print(x, ... , toLatex = FALSE, cutstr = NULL, toMarkdown = FALSE)

Arguments

x

x is a matrix/data.frame or a formula defining which variable to use in the
correlation matrix (see details).

y

y is a matrix/data.frame to correlate against x. If x is a formula y is passed to
data argument

method

Method used to compute correlations.

alternative

Unilateral (one.sided) test or bilateral (two.sided) test. See help(cor) for
more details.

exact

Logical value to know if a p.value is exact or asymptotic. See help(cor) for
more details.

use

Methods to deal with missing values.

continuity

Logical value to know if continuity correction must be used. See help(cor) for
more details.

... unused in this function

data

data.frame to use in conjunction with formula

toLatex

Logical value to know if output displayed as a latex tabular environment.

cutstr

Optional digits that cut the length of variable names

toMarkdown

Logical value to know if output should be displayed as a markdown table for
report

Value

Returns a list with correlations, N for each pair of correlations and p.value for each correlations.

Author(s)

Charles-Édouard Giguère

Examples

require(CUFF)
X=rnorm(10)
Y=rnorm(10)
correlation(cbind(X,Y))
cross

Crosstabs

Description

Functions to display (2 x 2) contingency table

Usage

cross(x, ...)

Arguments

x

Object of type table or formula, vector to tabulate

...

Arguments passed to table of xtabs

Details

The xtab functions corrects the inability to deal with missing values in the original xtabs that comes with R base.

Value

The cross methods returns an object of type cross with the original table and the marginal percentages by row and by column. A print methods is associated with a cross object. xtab returns an object of type table (see details). Total returns a sum with na.rm=TRUE by default and replaces NA with 0.

Author(s)

Charles-Édouard Giguère

Examples

require(CUFF)
### example of crosstabs
cr1 <- cross( ~ N + P, npk)
print(cr1, test = c("chisq.test", "fisher.test"))
freq

Frequencies

Description

Functions to display frequency

Usage

freq(x, y = NULL, ..., labels = NULL, data = NULL)
## S3 method for class 'frequencies'
print(x, ..., toLatex = FALSE)

Arguments

x          Object of type formula, matrix or data.frame
y          If x is a formula, y or data contains the data from x or are set to NULL if the
            variables are in the main environment
...        used for compatibility
labels     Optional vector of labels the same length as the dimension of x or the number
            of variables in formula.
data       see y for details
toLatex    Logical value that indicates if the print methods should return a tabular latex
            environment to use with Sweave or knitr.

Details

The freq methods returns an object of type frequencies object with a print methods associated.

Value

An object of type "frequencies" that is a list of matrix containing the frequencies the % and the %
with missing value.

Author(s)

Charles-Édouard Giguère

Examples

require(CUFF)
### example of crosstabs
fr1 <- freq( ~ N + P, npk, c("Nitrogen", "Phosphate"))
fr1
### To use with sweave or knitr.
print(fr1, toLatex = TRUE)
ftab  Fonctions pour ajouter les pourcentages dans les tables

Description
La fonction retourne une table avec le contenu en caractères de la fréquence et du pourcentage

Usage
ftab(xt, margin = seq_along(dim(xt)), fmt = "%d (%5.1f %)", quiet = FALSE)

Arguments
xt Une table de contingence générée avec table ou xtabs
margin Si 2x2, est que le pourcentage est en ligne (1) ou en colonne(2) ou total (1:2). Par défaut, pourcentage total. Ne sert à rien lorsque le tableau est à une dimension.
fmt format d'affichage
quiet Valeur logique qui indique si le tableau est imprimé

Value
Retourne une table avec le contenu en caractères de la fréquence et du pourcentage

Author(s)
Charles-Édouard Giguère

Examples
ex <- as.table(cbind(3:4,5:6))
ftab(ex,2)

meansd  function to compute mean and sd into a single string

Description
Methods that estimates a mean and sd and stores it into a single string

Usage
meansd(x, digits = c(1, 1))
Arguments
   x   A vector of numeric value
digits   digits for respectively the mean and sd. If a single value is entered it applies to
         mean and sd

Value
   Returns a string containing mean and sd with entered digit precisions.

Author(s)
   Charles-Édouard Giguère

Examples
   xf(Sepal.Width ~ Species, iris, meansd)

---

Description
   A 10 color palette.

Usage
   pal_CUFF(n = 10, pal = "CUFF")

Arguments
   n   Integer indicating the number of color desired (1-10)
   pal   The only value possible for now is CUFF

Value
   Returns a vector of color.

Author(s)
   Charles-Édouard Giguère

Examples
   pal_CUFF(3)
printcross

Crosstabs print methods

Description

Functions to display (2 x 2) contingency table

Usage

## S3 method for class 'cross'
print(x, ..., test = "chisq.test", export = NULL)

Arguments

x Object of type cross to print
...
Unused arguments
test list of statistical tests (as character vector) passed to the 2x2 table. By default, test is set to "chisq.test" which performs a khi-square test with Yates continuity correction.
export Either "pdf" or "xlsx" or NULL. Crosstab is flushed into either a pdf using latex or an Excel spreadsheet using package openxlsx

Details

Export to "pdf", "xlsx" open the crosstabs in the corresponding formats.

Value

Print methods associated with the cross object.

Author(s)

Charles-Édouard Giguère

Examples

require(CUFF)
### example of crosstabs
cr1 <- cross(~ N + P, npk)
print(cr1, test = c("chisq.test", "fisher.test"))
pv  

Format p-values

Description

This is a function that format p-values for publication.

Usage

\texttt{pv(p, style = 1)}

Arguments

- \texttt{p}  
  A vector of p-values
- \texttt{style}  
  By default (1), formatting according to APA style guide version 6

Details

- (1) APA: 2 digits of significance except if \( p < 0.05 \). If \( p < 0.05 \) we use 3 digits of significance except if \( p < 0.001 \) when we print "<0.001".
- (2) Other: 4 digits of significance except if \( p < 0.0001 \) when we print "<0.0001".

Value

returns a character vector of formatted p-value.

Author(s)

Charles-Édouard Giguère

Examples

\begin{verbatim}
\texttt{p <- c(0.1563, 0.0122, 0.00001)}
\texttt{pv(p)}
\end{verbatim}

strutils  

Utility functions to treat characters

Description

Function \%+% paste characters with other characters pairwise. Function \%n\% is used to repeat a character \( n \) time. Function numtostr converts numeric to a string in a nice format.
**Usage**

\[ x \%+% y \]
\[ x \%n% y \]
\[ \text{numtostr}(x,\text{nch},\text{digits}=4) \]

**Arguments**

- **x**: Character vector or a numeric vector for `numtostr` functions
- **y**: Character vector
- **nch**: (Optional) length of the resulting character vector
- **digits**: Number of digits in the resulting strings

**Value**

Function `%+%` is an operator that shortens `paste(x, y, sep="")` see `help(paste)` for more options. Function `%n%` returns the character vector `x` repeated `y` times. If both `x` and `y` are vector each element of `x` are applied to each element of `y`. Function `numtostr` converts numerical vector to a character vector using a nice format.

**Author(s)**

Charles-Édouard Giguère

**Examples**

```r
require(CUFF)
"Hello " %+% "world."
cat(" " %n% c(rep(1,9),2) %+% 1:10,fill=TRUE)
### Returns a * because specified length of character is unsufficient.
numtostr(9048948449.94948,nch=8)
```

---

**Description**

Methods that estimates a sum weighted by the number of non-missing values

**Usage**

```r
## S3 method for class 'n'
sum(x,n = 1, ...)
```
Arguments

\[ x \] A vector of values possibly containing missing values.
\[ n \] Minimum number of valid values
\[ \ldots \] extra parameters to sum

Details

\[ \text{sum}(x, n) = \text{mean}(x) \times \text{length}(x) / \text{n.valid}(x) \]

Value

sum.n returns the values of the weighted sum.

Author(s)

Charles-Édouard Giguère

Examples

\[
\text{sum.n}(c(1, 2, \text{NA}, \text{NA}), n = 2) \\
## [1] 6
\]
\[
\text{sum.n}(c(1, \text{NA}, \text{NA}, \text{NA}), n = 2) \\
## [1] \text{NA}
\]

---

\textbf{to_csv} \hspace{2cm} \textit{Export into a csv file with a format csv companions for factors}

Description

This function exports a data frame into a csv file with a csv companion file containing formats to properly reimport data into R.

Usage

\[
\text{column_types(data)} \\
\text{to_csv(data, file)}
\]

Arguments

\[ \text{data} \] A \texttt{data.frame} containing data to export
\[ \text{file} \] Name of the csv file to export to

Value

returns nothing
# Description

Wrapper to DT::datatable.

## Usage

```r
view(x, ...)
```

## Arguments

- `x`: x is a matrix/data.frame/table format for viewing
- `...`: arguments passed to datatable

## Value

Export data to be viewed as a web page. See `help(datatable, package = "DT")` for further details.

## Author(s)

Charles-Édouard Giguère

## Examples

```r
# to_csv(iris,"iris.csv")

view(iris)

### add filter on top.
view(iris, filter = "top")
```
Methods that apply a function across a levels of one or more factors

Description

Methods that apply a function across a levels of one or more factors. It works like aggregate but returns a table instead. It also has a useNA options that adds NA as a level before applying the function.

Usage

xf(formula, data, FUN, ..., subset, na.action = na.omit, useNA = FALSE, addmargins = TRUE)

Arguments

formula Formula defining the variables. On the left is the variable we are applying the function to, on the right, variables defining levels of the tables

data Data.frame containing the variables

FUN The function to apply to each subset of data

subset Vectors defining a subset of data.frame (see help(aggregate)).

na.action Action functions to deal with NA in data file

useNA Make NA a level of the factors (if any)

addmargins Add function applied to the margins of each category

Value

xf returns an object "xf" that behaves like a table with all associated methods.

Author(s)

Charles-Édouard Giguère

Examples

res <- xf(Sepal.Length~Species,iris,mean)
barplot(res)
Description

Functions to create contingency table using formula

Usage

\[
\text{xtab}(\text{formula, data, useNA} = \text{FALSE, exclude} = \text{c(NA,NaN), miss.char} = \text{"-"}, \\
\text{na.action} = \text{na.exclude, subset} = \text{NULL, sparse} = \text{FALSE,} \\
\text{drop.unused.levels} = \text{FALSE}) \\
\text{Total(x)}
\]

Arguments

- **formula**: Object of class `cross` to be printed
- **data**: data frame to use with formula
- **useNA**: logical values to add NA to the levels in the table
- **exclude**: levels to exclude from table
- **miss.char**: Character to replace NA
- **na.action**: methods to deal with NA
- **subset**: subset to use in data
- **sparse**: see help(\text{xtabs}) for details
- **drop.unused.levels**: logical values indicating whether we drop empty levels
- **x**: numerical vector

Details

The \text{xtab} functions corrects the inability to deal with missing values in the original \text{xtabs} that comes with R base. Total is a utility function to use in conjunction with \text{addmargins} instead of sum.

Value

\text{xtab} returns an object of type `table` (see details). Total returns a sum with na.rm=\text{TRUE} by default and replaces NA with 0.

Author(s)

Charles-Édouard Giguère

Examples

\[
\text{require(CUFF)} \\
\text{### example of crosstabs} \\
\text{xtab( ~ N + P, npk)}
\]
xyboth  Utility function to match 2 indices

Description

Function %xyb% or xyboth(x, y) shows index present in x, y and both

Usage

x %xyb% y
xyboth(x, y)

Arguments

x vector(matrix/dataframe) of indices
y vector(matrix/dataframe) of indices

Value

Returns a list with indices present only in x and y and in both.

Author(s)

Charles-Édouard Giguère

Examples

require(CUFF)
xyboth(1:5, 3:6)
### $x
### [1] "1" "2"
###
### $y
### [1] "6"
###
### $both
### [1] "3" "4" "5"
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