Package ‘CUFF’

October 12, 2022

Note  -*- Encoding: utf-8 -*-

Type  Package

Title  Charles's Utility Function using Formula

Version  1.8

Date  2022-02-14

Author  Charles-Édouard Giguère

Maintainer  Charles-Édouard Giguère <ce.giguere@gmail.com>

Depends  R (>= 3.2.2)

Imports  xlsx, xtable, DT, lmerTest, nlme, haven, dplyr

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.

License  GPL (>= 2)

Encoding  UTF-8

LazyLoad  TRUE

URL  https://github.com/giguerch/CUFF

NeedsCompilation  no

Repository  CRAN

Date/Publication  2022-02-22 18:20:02 UTC

R topics documented:

    cf ..................................................................  2
    clip ..................................................................  3
    correlation .............................................................  4
    cross ..................................................................  5
    freq ..................................................................  6
    ftab ..................................................................  7
    meansd ..................................................................  7
Description
This function extract coefficients tables from common statistical model (lm/glm/lme/lmer/t-test) and format them.

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

Arguments
\begin{itemize}
\item \textbf{x} \hspace{1cm} \text{x is a lm/glm/lme/lmer/t.test model} \\
\item \textbf{addci} \hspace{1cm} \text{Logical value that tells R to add a 95\% confidence interval to the output. True by default.} \\
\item \textbf{pv.style} \hspace{1cm} \text{Integer specifying the style (1 or 2) of p-value formatting. See help(pv) for details} \\
\item \textbf{signif} \hspace{1cm} \text{Either an integer specifying the number of significant digits or a dimension 3 vector for respectively the estimate, standard error and t-value} \\
\item \textbf{expcf} \hspace{1cm} \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)} \\
\item \ldots \hspace{1cm} \text{Not used yet}
\end{itemize}

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)
```

clip  Send to clipboard

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`  
  x is 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

Examples

```r
clip(iris[1:6,])
```
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.

Usage

```r
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**

```r
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**

```r
require(CUFF)
### example of crosstabs
fr1 <- freq(~ N + P, npk, c("Nitrogen", "Phosphate"))
fr1
### To use with sweave or knitr.
print(fr1, toLatex = TRUE)
```
\texttt{ftab} \hspace{1cm} \textit{Fonctions pour ajouter les pourcentages dans les tables}

\textbf{Description}

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

\textbf{Usage}

\texttt{ftab(xt, margin = seq_along(dim(xt)), fmt = "%d (%5.1f \%)", quiet = FALSE)}

\textbf{Arguments}

\begin{itemize}
  \item \texttt{xt} \hspace{1cm} Une table de contingence générée avec \texttt{table} ou \texttt{xtabs}.
  \item \texttt{margin} \hspace{1cm} 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.
  \item \texttt{fmt} \hspace{1cm} format d’affichage.
  \item \texttt{quiet} \hspace{1cm} Valeur logique qui indique si le tableau est imprimé.
\end{itemize}

\textbf{Value}

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

\textbf{Author(s)}

Charles-Édouard Giguère

\textbf{Examples}

\begin{verbatim}
ex <- as.table(cbind(3:4,5:6))
ftab(ex,2)
\end{verbatim}

---

\texttt{meansd} \hspace{1cm} \textit{function to compute mean and sd into a single string}

\textbf{Description}

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

\textbf{Usage}

\texttt{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

```r
## 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

```r
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**

```r
pv(p, style = 1)
```

**Arguments**

- `p`: A vector of p-values
- `style`: By default (1), formatting according to APA style guide version 6

**Details**

- (1) APA: 2 digits of significance except if p is <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**

```r
p <- c(0.1563, 0.0122, 0.00001)
pv(p)
```

---

**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
numtostr(x,nch,digits=4)

Arguments

x Character vector or a numeric vector for numtostr functions
y Character vector
nch (Optionnal) 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

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)

sum.n

sum weighted on the number of non-missing values

Description

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

Usage

## 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
- `...`: extra parameters to sum

Details

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

Value

`sum.n` returns the values of the weighted sum.

Author(s)

Charles-Édouard Giguère

Examples

```r
sum.n(c(1, 2, NA, NA), n = 2)
## [1] 6
sum.n(c(1, NA, NA, NA), n = 2)
## [1] NA
```

---

**to_csv**

*Export into a csv file with a format csv companions for factors*

Description

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

Usage

```r
column_types(data)
to_csv(data, file)
```

Arguments

- `data`: A `data.frame` containing data to export
- `file`: Name of the csv file to export to

Value

returns nothing
Description

Wrapper to DT::datatable.

Usage

view(x, ...)

Arguments

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

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
- ...: extra parameters to FUN
- 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)
xtab

Crosstabulations using formula

Description

Functions to create contingency table using formula

Usage

xtab(formula, data, useNA = FALSE, exclude = c(NA, NaN), miss.char = "-",
na.action = na.exclude, subset = NULL, sparse = FALSE,
drop.unused.levels = FALSE)
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(xtabs) for details
drop.unused.levels logical values indicating whether we drop empty levels
x numerical vector

Details

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

Value

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
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"
### Index

- **APA**
  - pv, 10
- **cf**
  - cf, 2
- **character**
  - strutils, 10
- **char**
  - strutils, 10
- **clipboard**
  - clip, 3
- **clip**
  - clip, 3
- **coefficients**
  - cf, 2
- **correlation**
  - correlation, 4
  - view, 13
- **corr**
  - correlation, 4
  - view, 13
- **cor**
  - correlation, 4
  - view, 13
- **cross**
  - cross, 5
  - printcross, 9
  - xtab, 15
- **csv**
  - to_csv, 12
- **export**
  - to_csv, 12
- **format**
  - to_csv, 12
- **frequencies**
  - freq, 6
- **freq**
  - freq, 6
- **ftab**
  - ftab, 7
- **intersect**
  - xyboth, 16
- **mean**
  - meansd, 7
- **missing**
  - sum.n, 11
- **p-value**
  - pv, 10
- **palette**
  - pal_CUFF, 8
- **paste**
  - strutils, 10
- **pv**
  - pv, 10
- **sd**
  - meansd, 7
- **sum**
  - sum.n, 11
- **table**
  - cross, 5
  - ftab, 7
  - printcross, 9
  - xf, 14
  - xtab, 15
- **xf**
  - xf, 14
- **xtabs**
  - ftab, 7
- **xtab**
  - ftab, 7
- **xyboth**
  - xyboth, 16
  - %*(strutils), 10
  - %*-%methods(strutils), 10
  - %n*(strutils), 10
  - %xyb*(xyboth), 16
  - cf, 2
  - clip, 3
  - column_types(to_csv), 12
correlation, 4
cross, 5
freq, 6
ftab, 7
meansd, 7
numtostr (strutils), 10
pal_CUFF, 8
paste (strutils), 10
print.corr (correlation), 4
print.cross (printcross), 9
print.frequencies (freq), 6
printcross, 9
pv, 10
strutils, 10
sum.n, 11
to_csv, 12
Total (xtab), 15
view, 13
xf, 14
xtab, 15
xyboth, 16