

# Package ‘CUFF’

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

**Type** Package

**Title** Charles's Utility Function using Formula

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**Author** Charles-Édouard Giguère

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

**Depends** R (>= 3.2.2)

**Imports** openxlsx, xtable, DT, lmerTest, nlme

**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

**LazyData** YES

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## R topics documented:

cf	2
clip	3
correlation	3
cross	5
freq	6
ftab	7

meansd . . . . .	7
printcross . . . . .	8
pv . . . . .	9
strutils . . . . .	10
sum.n . . . . .	11
view . . . . .	12
xf . . . . .	12
xtab . . . . .	13

<b>Index</b>	<b>15</b>
--------------	-----------

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cf	<i>Extract and format coefficients table</i>
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## Description

This function extract coefficients tables from common statistical model (lm/glm/lme/lmer/t-test) and format them.

## Usage

```
cf(x, addci = TRUE, pv.style = 1, signif = 2, expcf, ...)
```

## Arguments

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

## Value

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

## Author(s)

Charles-Édouard Giguère

## Examples

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

---

clip	<i>Send to clipboard</i>
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---

**Description**

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

**Usage**

```
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**

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

---

correlation	<i>Bivariate correlations</i>
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---

**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**

```
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	<i>Crosstabs</i>
-------	------------------

---

## 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**

<code>xt</code>	Une table de contingence généré avec <code>table</code> ou <code>xtabs</code>
<code>margin</code>	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.
<code>fmt</code>	format d'affichage
<code>quiet</code>	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)
```

---

printcross	<i>Crosstabs print methods</i>
------------	--------------------------------

---

**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**

```
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**

```
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

<code>x</code>	Character vector or a numeric vector for <code>numtostr</code> functions
<code>y</code>	Character vector
<code>nch</code>	(Optional) length of the resulting character vector
<code>digits</code>	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 insufficient.
numtostr(9048948449.94948,nch=8)
```

---

sum.n	<i>sum weighted on the number of non-missing values</i>
-------	---

---

## 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

$$\text{sum}(x,n) = \text{mean}(x) * \text{length}(x) / n.\text{valid}(x)$$

## Value

sum.n returns the values of the weighted sum.

## Author(s)

Charles-Édouard Giguère

## Examples

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

---

 view

*view methods*


---

**Description**

Wrapper to DT::datatable.

**Usage**

```
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**

```
view(iris)
### add filter on top.
view(iris, filter = "top")
```

---

 xf

*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)
```

---

xstab

*Crosstabulations using formula*


---

**Description**

Functions to create contingency table using formula

**Usage**

```
xstab(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**

<code>formula</code>	Object of class <code>cross</code> to be printed
<code>data</code>	data frame to use with formula
<code>useNA</code>	logical values to add NA to the levels in the table
<code>exclude</code>	levels to exclude from table
<code>miss.char</code>	Character to replace NA
<code>na.action</code>	methods to deal with NA
<code>subset</code>	subset to use in data
<code>sparse</code>	see <code>help(xtabs)</code> for details
<code>drop.unused.levels</code>	logical values indicating whether we drop empty levels
<code>x</code>	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)
```

# Index

- \*Topic **APA**
  - pv, 9
- \*Topic **cf**
  - cf, 2
- \*Topic **character**
  - strutils, 10
- \*Topic **char**
  - strutils, 10
- \*Topic **clipboard**
  - clip, 3
- \*Topic **clip**
  - clip, 3
- \*Topic **coefficients**
  - cf, 2
- \*Topic **correlation**
  - correlation, 3
  - view, 12
- \*Topic **corr**
  - correlation, 3
  - view, 12
- \*Topic **cor**
  - correlation, 3
  - view, 12
- \*Topic **cross**
  - cross, 5
  - printcross, 8
  - xtab, 13
- \*Topic **frequencies**
  - freq, 6
- \*Topic **freq**
  - freq, 6
- \*Topic **ftab, table, xtabs, xtab**
  - ftab, 7
- \*Topic **mean**
  - meansd, 7
- \*Topic **missing**
  - sum.n, 11
- \*Topic **p-value**
  - pv, 9
- \*Topic **paste**
  - strutils, 10
- \*Topic **pv**
  - pv, 9
- \*Topic **sd**
  - meansd, 7
- \*Topic **sum**
  - sum.n, 11
- \*Topic **table**
  - cross, 5
  - printcross, 8
  - xf, 12
  - xtab, 13
- \*Topic **xf**
  - xf, 12
- %+(strutils), 10
- %+-methods (strutils), 10
- %n%(strutils), 10
- cf, 2
- clip, 3
- correlation, 3
- cross, 5
- freq, 6
- ftab, 7
- meansd, 7
- numtostr (strutils), 10
- paste (strutils), 10
- print.corr (correlation), 3
- print.cross (printcross), 8
- print.frequencies (freq), 6
- printcross, 8
- pv, 9
- strutils, 10
- sum.n, 11

Total (xtab), 13

view, 12

xf, 12

xtab, 13