Package 'rapportools'

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Title Miscellaneous (stats) helper functions with sane defaults for reporting

Type Package

Encoding UTF-8

Description Helper functions that act as wrappers to more advanced statistical methods with the advantage of having sane defaults for quick reporting.

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R topics documented:

`adj.rle` *Adjacent Values Run Length Encoding*

Description

Similar to `rle` function, this function detects "runs" of adjacent integers, and displays vector of run lengths and list of corresponding integer sequences.

Usage

```
adj.rle(x)
```

Arguments

x	a numeric vector with

Value

a list with two elements: vector of run lengths, and another list of values corresponding to generated sequences' lengths.

Author(s)

Gabor Grothendieck <ggrothendieck@gmail.com>

References

See original thread for more details http://stackoverflow.com/a/8467446/457898. Special thanks to Gabor Grothendieck for this one!

`alike.integer` *Check integers*

Description

This function tests if given variable "appears" to be an integer. To qualify as such, two conditions need to be satisfied: it should be stored as `numeric` object, and it should pass regular expression test if it consists only of digits.

Usage

```
alike.integer(x)
```

Arguments

x	a numeric variable that is to be tested

Value

a logical value that indicates that tested variable "looks like" integer

capitalise *Capitalise String*

Description

Capitalises strings in provided character vector

Usage

```
capitalise(x)
```

Arguments

x	a character vector to capitalise

Value

character vector with capitalised string elements

Examples

```
capitalise(c("foo", "bar")) # [1] "Foo" "Bar"
```

catn *Concatenate with newline*

Description

A simple wrapper for `cat` function that appends newline to output.

Usage

```
catn(...)
```

Arguments

...	arguments to be passed to `cat` function

Value

None (invisible `NULL`).

fml *Create Formula from Strings*

Description

Takes multiple character arguments as left and right-hand side arguments of a formula, and concatenates them in a single string.

Usage

```
fml(left, right, join.left = " + ", join.right = " + ")
```

Arguments

left	a string with left-hand side formula argument
right	a character vector with right-hand side formula arguments
join.left	concatenation string for elements of character vector specified in left
join.right	concatenation string for elements of character vector specified in right

Examples

```
fml("hp", c("am", "cyl"))    # "hp ~ am + cyl"
```

htest *Hypothesis Tests*

Description

This function uses htest.short, to extract statistic and p-value from htest-classed object. Main advantage of using htest is that it's vectorised, and can accept multiple methods.

Usage

```
htest(x, ..., use.labels = getOption("rapport.use.labels"),
  use.method.names = TRUE, colnames = c("Method", "Statistic", "p-value"))
```

Arguments

x	arguments to be passed to function specified in test
...	additional arguments for function specified in test
use.labels	a logical value indicating whether variable labels should be placed in row names. If set to FALSE, output of deparse(substitute(x)) will be used.
use.method.names	use the string provided in method attribute of htest object
colnames	a character string containing column names

Details

Default parameters are read from `options`:

- 'rapport.use.labels'.

Value

a `data.frame` with applied tests in rows, and their results (statistic and p-value) in columns

Examples

```
## Not run:
library(nortest)
htest(rnorm(100), shapiro.test)
htest(rnorm(100), lillie.test, ad.test, shapiro.test)
htest(mtcars, lillie.test)
htest(mtcars, lillie.test, ad.test, shapiro.test)

## End(Not run)
```

`htest.short` *Extract Values from* `htest` *Objects*

Description

Extract value of statistic and its p-value from `htest` object.

Usage

```
htest.short(x)
```

Arguments

`x`	`htest`-class object

Value

named numeric vector with the value of statistic and its p-value

Examples

```
## Not run:
htest.short(shapiro.test(rnorm(100)))

## End(Not run)
```

iqr *Interquartile Range*

Description

Calculates interquartile range of given variable. See `univar` for details.

Usage

```
iqr(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with variable's interquartile range

is.boolean *Boolean*

Description

Checks if provided object is a boolean i.e. a length-one logical vector.

Usage

```
is.boolean(x)
```

Arguments

`x`	an object to check

Value

a logical value indicating whether provided object is a boolean

Examples

```
## Not run:
    is.boolean(TRUE)                # [1] TRUE
    # the following will work on most systems, unless you have tweaked global Rprofile
    is.boolean(T)                   # [1] TRUE
    is.boolean(1)                   # [1] FALSE
    is.string(c("foo", "bar"))      # [1] FALSE

## End(Not run)
```

is.empty *Empty Value*

Description

Rails-inspired helper that checks if vector values are "empty", i.e. if it's: NULL, zero-length, NA, NaN, FALSE, an empty string or 0. Note that unlike its native R is.<something> sibling functions, is.empty is vectorised (hence the "values").

Usage

```
is.empty(x, trim = TRUE, ...)
```

Arguments

x	an object to check its emptiness
trim	trim whitespace? (TRUE by default)
...	additional arguments for sapply

Examples

```
## Not run:
is.empty(NULL)     # [1] TRUE
is.empty(c())      # [1] TRUE
is.empty(NA)       # [1] TRUE
is.empty(NaN)      # [1] TRUE
is.empty("")       # [1] TRUE
is.empty(0)        # [1] TRUE
is.empty(0.00)     # [1] TRUE
is.empty("    ")   # [1] TRUE
is.empty("foobar") # [1] FALSE
is.empty("    ", trim = FALSE)    # [1] FALSE
# is.empty is vectorised!
all(is.empty(rep("", 10)))        # [1] TRUE
all(is.empty(matrix(NA, 10, 10))) # [1] TRUE

## End(Not run)
```

is.number *Numbers*

Description

Checks if provided object is a number, i.e. a length-one numeric vector.

Usage

```
is.number(x, integer = FALSE)
```

Arguments

x	an object to check
integer	logical: check if number is integer

Value

a logical value indicating whether provided object is a string

Examples

```
is.number(3)              # [1] TRUE
is.number(3:4)            # [1] FALSE
is.number("3")            # [1] FALSE
is.number(NaN)            # [1] TRUE
is.number(NA_integer_)    # [1] TRUE
```

---

is.string *Strings*

Description

Checks if provided object is a string i.e. a length-one character vector.

Usage

```
is.string(x)
```

Arguments

x	an object to check

Value

a logical value indicating whether provided object is a string

Examples

```
is.string("foobar")          # [1] TRUE
    is.string(1)                 # [1] FALSE
    is.string(c("foo", "bar"))   # [1] FALSE
```

is.tabular *Tabular Structure*

Description

Checks if object has "tabular" structure (not to confuse with `table`) - in this particular case, that means `matrix` and `data.frame` objects only.

Usage

```
is.tabular(x)
```

Arguments

x	an object to be checked for "tabular" format

Value

a logical value indicating that provided object has tabular structure

Examples

```
is.tabular(HairEyeColor[, , 1])  # [1] TRUE
is.tabular(mtcars)               # [1] TRUE
is.tabular(table(mtcars$cyl))    # [1] FALSE
is.tabular(rnorm(100))           # [1] FALSE
is.tabular(LETTERS)              # [1] FALSE
is.tabular(pi)                   # [1] FALSE
```

is.variable *Variables*

Description

From *rapport*'s point of view, a `variable` is a non-`NULL` atomic vector that has no dimension attribute (see `dim` for details). This approach bypasses `factor` issues with `is.vector`, and also eliminates multidimensional vectors, such as matrices and arrays.

Usage

```
is.variable(x)
```

Arguments

x	an object to be checked for "variable" format

Value

a logical value indicating that provided object is a "variable"

Examples

```
is.variable(rnorm(100))  # [1] TRUE
is.variable(LETTERS)     # [1] TRUE
is.variable(NULL)        # [1] FALSE
is.variable(mtcars)      # [1] FALSE
is.variable(HairEyeColor[, , 1])  # [1] FALSE
is.variable(list())      # [1] FALSE
```

`kurtosis` *Kurtosis*

Description

Calculates kurtosis coefficient for given variable (see `is.variable`), `matrix` or a `data.frame`.

Usage

```
kurtosis(x, na.rm = TRUE)
```

Arguments

`x`	a `variable`, `matrix` or a `data.frame`
`na.rm`	should `NA`s be removed before computation?

References

Tenjovic, L. (2000). Statistika u psihologiji - prirucnik. Centar za primenjenu psihologiju.

Examples

```
set.seed(0)
x <- rnorm(100)
kurtosis(x)
kurtosis(matrix(x, 10))
kurtosis(mtcars)
rm(x)
```

label *Get Variable Label*

Description

This function returns character value previously stored in variable's `label` attribute. If none found, and `fallback` argument is set to `TRUE` (default), the function returns object's name (retrieved by `deparse(substitute(x))`), otherwise `NA` is returned with a warning notice.

Usage

```
label(x, fallback = TRUE, simplify = TRUE)
```

Arguments

`x`	an R object to extract labels from
`fallback`	a logical value indicating if labels should fallback to object name(s)
`simplify`	coerce results to a vector (`TRUE` by default), otherwise, a `list` is returned

Value

a character vector with variable's label(s)

Examples

```
## Not run:
x <- rnorm(100)
label(x)         # returns "x"
label(x, FALSE)  # returns NA and issues a warning

label(mtcars$hp) <- "Horsepower"
label(mtcars)         # returns "Horsepower" instead of "hp"
label(mtcars, FALSE)  # returns NA where no labels are found
label(sleep, FALSE)   # returns NA for each variable and issues a warning

## End(Not run)
```

label<- *Set Variable Label*

Description

This function sets a label to a variable, by storing a character string to its `label` attribute.

Usage

```
label(var) <- value
```

Arguments

var	a variable (see is.variable for details)
value	a character value that is to be set as variable label

See Also

label

Examples

```
## Not run:
label(mtcars$mpg) <- "fuel consumption"
x <- rnorm(100)
(label(x) <- "pseudo-random normal variable")

## End(Not run)
```

---

lambda.test *Goodman and Kruskal's lambda*

Description

Computes Goodman and Kruskal's lambda for given table.

Usage

```
lambda.test(table, direction = 0)
```

Arguments

table	a table of two variables or a data.frame representation of the cross-table of the two variables without marginals
direction	numeric value of c(0, 1, 2) where 1 means the lambda value computed for row, 2 for columns and 0 for both

Value

computed lambda value(s) for row/col of given table

References

- Goodman, L.A., Kruskal, W.H. (1954) Measures of association for cross classifications. Part I. *Journal of the American Statistical Association* **49**, 732–764

Examples

```
## Not run:
## quick example
x <- data.frame(x = c(5, 4, 3), y = c(9, 8, 7), z = c(7, 11, 22), zz = c(1, 15, 8))
lambda.test(x)    # 0.1 and 0.18333
lambda.test(t(x)) # 0.18333 and 0.1

## historical data (see the references above: p. 744)
men.hair.color <- data.frame(
b1 = c(1768, 946, 115),
b2 = c(807, 1387, 438),
b3 = c(189, 746, 288),
b4 = c(47, 53, 16)
)
row.names(men.hair.color) <- paste0('a', 1:3)
lambda.test(men.hair.color)
lambda.test(t(men.hair.color))

## some examples on mtcars
lambda.test(table(mtcars$am, mtcars$gear))
lambda.test(table(mtcars$gear, mtcars$am))
lambda.test(table(mtcars$am, mtcars$gear), 1)
lambda.test(table(mtcars$am, mtcars$gear), 2)

## End(Not run)
```

`max` *Maximum*

Description

Returns the maximum of all values in a vector by passing {codemax as `fn` argument to `univar` function.

Usage

```
max(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with maximum value

mean *Mean*

Description

Calculates mean of given variable by passing `sum` as `fn` argument to `univar` function.

Usage

```
mean(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with variable's mean

median *Median*

Description

Calculates median of given variable. See `univar` for details.

Usage

```
median(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with variable's median

messagef *Send Message with String Interpolated Messages*

Description

Combines warning with sprintf thus allowing string interpolated diagnostic messages.

Usage

```
messagef(s, ...)
```

Arguments

s	a character vector of format strings
...	values to be interpolated

Examples

```
## Not run:
messagef("%.3f is not larger than %d and/or smaller than %d", pi, 10, 40)

## End(Not run)
```

min *Minimum*

Description

Returns the minimum of all values in a vector by passing {codemin as fn argument to univar function.

Usage

```
min(...)
```

Arguments

...	parameters to be passed to univar function

Value

a numeric value with minimum value

n *Number of Cases*

Description

Returns the number of valid (non-NA) values in a variable. This is a wrapper around univar function with length function passed in fn argument, but with missing values previously removed. However, it's not possible to cancel NA omission with this function (doing so will yield error).

Usage

```
n(...)
```

Arguments

...	parameters to be passed to univar function

Value

a numeric value with number of valid (non-NA) vector elements

name *Variable Name*

Description

This function returns character value previously stored in variable's name attribute. If none found, the function defaults to object's name.

Usage

```
name(x)
```

Arguments

x	an R (atomic or data.frame/list) object to extract names from

Value

a character value with variable's label

Examples

```
## Not run:
name(mtcars$am)
x <- 1:10
name(x)

## End(Not run)
```

nmissing *Number of Missing Cases*

Description

Returns a number of missing (NA) values in a variable. This is a wrapper around univar function with anonymous function passed to count number of NA elements in a variable.

Usage

```
nmissing(...)
```

Arguments

...	parameters to be passed to univar function

Value

a numeric value with number of missing vector elements

nvalid *Number of Valid Cases*

Description

Returns the number of valid (non-NA) values in a variable. This is a wrapper around univar function with length function passed in fn argument, but with missing values previously removed. However, it's not possible to cancel NA omission with this function (doing so will yield error).

Usage

```
nvalid(...)
```

Arguments

...	parameters to be passed to univar function

Value

a numeric value with number of valid (non-NA) vector elements

pct *Percent*

Description

Appends a percent sign to provided numerical value. Rounding is carried out according to value passed in `decimals` formal argument (defaults to value specified in `panderOptions('digits')`).

Usage

```
pct(x, digits = panderOptions("digits"), type = c("percent", "%",
  "proportion"), check.value = TRUE)
```

Arguments

`x`	a numeric value that is to be rendered to percent
`digits`	an integer value indicating number of decimal places
`type`	a character value indicating whether percent or proportion value was provided (partial match is allowed)
`check.value`	perform a sanity check to see if provided numeric value is correct (defaults to `TRUE`)

Value

a character value with formatted percent

percent *Percent*

Description

Calculates percentage of cases for provided variable and criteria specified in `subset` argument. Function accepts numeric, factor and logical variables for `x` parameter. If numeric and/or factor is provided, subsetting can be achieved via `subset` argument. Depending on value of `na.rm` argument, either valid (`na.rm = TRUE`) or all cases (`na.rm = FALSE`) are taken into account. By passing logical variable to `x`, a sum of (`TRUE`) elements is calculated instead, and valid percents are used (`NA` are excluded).

Usage

```
percent(x, subset = NULL, na.rm = TRUE, pct = FALSE, ...)
```

Arguments

x	a numeric variable to be summarised
subset	an expression that evaluates to logical vector (defaults to NULL)
na.rm	should missing values be
pct	print percent string too?
...	additional arguments for pct function

Value

a numeric or string depending on the value of pct

Examples

```
## Not run:
set.seed(0)
x <- sample(5, 100, replace = TRUE)
percent(x > 2)

## End(Not run)
```

---

range *Range*

Description

Calculates difference between the largest and the smallest value in a vector. See univar for details.

Usage

```
range(...)
```

Arguments

...	parameters to be passed to univar function

Value

a numeric value with calculated range

rp.desc *Descriptive Statistics*

Description

Aggregate table of descriptives according to functions provided in fn argument. This function follows melt/cast approach used in reshape package. Variable names specified in measure.vars argument are treated as measure.vars, while the ones in id.vars are treated as id.vars (see melt.data.frame for details). Other its formal arguments match with corresponding arguments for cast function. Some post-processing is done after reshaping, in order to get pretty row and column labels.

Usage

```
rp.desc(measure.vars, id.vars = NULL, fn, data = NULL, na.rm = TRUE,
  margins = NULL, subset = TRUE, fill = NA, add.missing = FALSE,
  total.name = "Total", varcol.name = "Variable",
  use.labels = getOption("rapport.use.labels"), remove.duplicate = TRUE)
```

Arguments

measure.vars	either a character vector with variable names from data, a numeric vector, or a data.frame
id.vars	same rules apply as in measure.vars, but defaults to NULL
fn	a list with functions or a character vector with function names
data	a data.frame holding variables specified in id.vars and measure.vars
na.rm	a logical value indicating whether NA values should be removed
margins	should margins be included? (see documentation for eponymous argument in melt.data.frame)
subset	a logical vector to subset the data before aggregating
fill	value to replace missing level combinations (see documentation for eponymous argument in melt.data.frame)
add.missing	show missing level combinations
total.name	a character string with name for "grand" margin (defaults to "Total")
varcol.name	character string for column that contains summarised variables (defaults to "Variable")
use.labels	use labels instead of variable names in table header (handle with care, especially if you have lengthy labels). Defaults to value specified in rapport.use.labels option.
remove.duplicate	should name/label of the variable provided in measure.vars be removed from each column if only one measure.var is provided (defaults to TRUE)

Value

a data.frame with aggregated data

Examples

```
rp.desc("cyl", "am", c(mean, sd), mtcars, margins = TRUE)
## c
rp.desc("hp", c("am", "gear"), c("Average" = mean, "Deviation" = sd),
    mtcars, remove.duplicate = FALSE)
```

---

rp.freq *Frequency Table*

Description

Display frequency table with counts, percentage, and cumulatives.

Usage

```
rp.freq(f.vars, data, na.rm = TRUE, include.na = FALSE,
  drop.unused.levels = FALSE, count = TRUE, pct = TRUE,
  cumul.count = TRUE, cumul.pct = TRUE, total.name = "Total",
  reorder = FALSE)
```

Arguments

f.vars	a character vector with variable names
data	a data.frame
na.rm	should missing values be removed?
include.na	should missing values be included in frequency table?
drop.unused.levels	should empty level combinations be left out
count	show frequencies?
pct	show percentage?
cumul.count	show cumulative frequencies?
cumul.pct	show cumulative percentage?
total.name	a sting containing footer label (defaults to "Total")
reorder	reorder the table based on frequencies?

Value

a data.frame with a frequency table

Examples

```
## Not run:
rp.freq(c("am", "cyl", "vs"), mtcars)

## End(Not run)
```

`rp.outlier` *Outlier test*

Description

A simple test for outliers. This functions returns all extreme values (if any) found in the specified vector.

Usage

```
rp.outlier(x)
```

Arguments

x	a numeric vector of values

Value

vector of outlier values

References

Credit goes to PaulHurleyuk: http://stackoverflow.com/a/1444548/564164

- Lund, R. E. 1975, "Tables for An Approximate Test for Outliers in Linear Models", Technometrics, vol. 17, no. 4, pp. 473-476.
- Prescott, P. 1975, "An Approximate Test for Outliers in Linear Models", Technometrics, vol. 17, no. 1, pp. 129-132.

Examples

```
## Not run:
rp.outlier(mtcars$hp)
rp.outlier(c(rep(1,100), 200))
rp.outlier(c(rep(1,100), 200,201))

## End(Not run)
```

sd *Standard Deviation*

Description

Calculates standard deviation of given variable. See `univar` for details.

Usage

```
sd(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with variable's standard deviation

se.mean *Standard Error of Mean*

Description

Calculates standard error of mean for given variable. See `univar` for details.

Usage

```
se.mean(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with standard error of mean

skewness *Skewness*

Description

Calculates skewness coefficient for given variable (see `is.variable`), `matrix` or a `data.frame`.

Usage

```
skewness(x, na.rm = TRUE)
```

Arguments

`x`	a `variable`, `matrix` or a `data.frame`
`na.rm`	should `NA`s be removed before computation?

References

Tenjovic, L. (2000). Statistika u psihologiji - prirucnik. Centar za primenjenu psihologiju.

Examples

```
set.seed(0)
x <- rnorm(100)
skewness(x)
skewness(matrix(x, 10))
skewness(mtcars)
rm(x)
```

stopf *Stop Execution with String Interpolated Messages*

Description

This helper combines `stop` function with `sprintf` thus allowing string interpolated messages when execution is halted.

Usage

```
stopf(s, ...)
```

Arguments

`s`	a character vector of format strings
`...`	values to be interpolated

Value

a string containing message that follows execution termination

Examples

```
## Not run:
stopf("%.3f is not larger than %d and/or smaller than %d", pi, 10, 40)

## End(Not run)
```

`sum` *Sum*

Description

Returns the sum of variable's elements, by passing `sum` as `fn` argument to `univar` function.

Usage

```
sum(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with sum of vector elements

`tocamel` *CamelCase*

Description

Convert character vector to camelcase - capitalise first letter of each word.

Usage

```
tocamel(x, delim = "[^[:alnum:]]", upper = FALSE, sep = "", ...)
```

Arguments

`x`	a character vector to be converted to camelcase
`delim`	a string containing regular expression word delimiter
`upper`	a logical value indicating if the first letter of the first word should be capitalised (defaults to `FALSE`)
`sep`	a string to separate words
`...`	additional arguments to be passed to `strsplit`

Value

a character vector with strings put in camelcase

Examples

```
tocamel("foo.bar")
    ## [1] "fooBar"

    tocamel("foo.bar", upper = TRUE)
    ## [1] "FooBar"

    tocamel(c("foobar", "foo.bar", "camel_case", "a.b.c.d"))
    ## [1] "foobar"    "fooBar"    "camelCase" "aBCD"
```

`trim.space` *Trim Spaces*

Description

Removes leading and/or trailing space(s) from a character vector. By default, it removes both leading and trailing spaces.

Usage

```
trim.space(x, what = c("both", "leading", "trailing", "none"),
  space.regex = "[:space:]", ...)
```

Arguments

`x`	a character vector which values need whitespace trimming
`what`	which part of the string should be trimmed. Defaults to `both` which removes trailing and leading spaces. If `none`, no trimming will be performed.
`space.regex`	a character value containing a regex that defines a space character
`...`	additional arguments for `gsub` function

Value

a character vector with (hopefully) trimmed spaces

univar *Descriptive Statistics*

Description

This function operates only on vectors or their subsets, by calculating a descriptive statistic specified in `fn` argument.

Usage

```
univar(x, subset = NULL, fn, na.rm = TRUE, ...)
```

Arguments

`x`	a numeric variable to be summarised
`subset`	an expression that evaluates to logical vector (defaults to `NULL`, in which case the function specified in `fun` is applied on a vector)
`fn`	a function or a function name to be applied on a variable or it's subset
`na.rm`	a logical value indicating whether `NA`'s should be removed (defaults to `TRUE`)
`...`	additional arguments for function specified in `fn`

Value

a numeric

var *Variance*

Description

Calculates variance of given variable. See `univar` for details.

Usage

```
var(...)
```

Arguments

`...`	parameters to be passed to `univar` function

Value

a numeric value with variable's variance

vgsub *Vectorised String Replacement*

Description

A simple wrapper for gsub that replaces all patterns from `pattern` argument with ones in `replacement` over vector provided in argument `x`.

Usage

```
vgsub(pattern, replacement, x, ...)
```

Arguments

`pattern`	see eponymous argument for gsub function
`replacement`	see eponymous argument for gsub function
`x`	see eponymous argument for gsub function
`...`	additional arguments for gsub function

Value

a character vector with string replacements

References

See original thread for more details http://stackoverflow.com/a/6954308/457898. Special thanks to user Jean-Robert for this one!

warningf *Send Warning with String Interpolated Messages*

Description

Combines `warning` with `sprintf` thus allowing string interpolated warnings.

Usage

```
warningf(s, ...)
```

Arguments

`s`	a character vector of format strings
`...`	values to be interpolated

Examples

```
## Not run:
warningf("%.3f is not larger than %d and/or smaller than %d", pi, 10, 40)

## End(Not run)
```

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