Package ‘hutils’

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hutils-package

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Description

Provides utility functions for, and drawing on, the 'data.table' package. The package also collates useful miscellaneous functions extending base R not available elsewhere. The name is a portmanteau of 'utils' and the author.

Details

The package attempts to provide lightweight, fast, and stable functions for common operations.

By **lightweight**, I mean in terms of dependencies: we import package: data.table and package: fastmatch which do require compilation, but in C. Otherwise, all dependencies do not require compilation.

By **fast**, I mean essentially as fast as possible without using compilation.

By **stable**, I mean that unit tests _should not change_ unless the major version also changes. To make this completely transparent, tests include the version of their introduction and are guaranteed to not be modified (not even in the sense of adding extra, independent tests) while the major version is 1. Tests that do not include the version in their filename may be modified from version to version (though this will be avoided).

ahull

Maximum area given x and y coordinates

Description

Present since hutils 1.2.0.
Usage

\begin{verbatim}
ahull(
  DT,
  x = DT$x,
  y = DT$y,
  minH = 0,
  minW = 0,
  maximize = "area",
  incl_negative = FALSE
)
\end{verbatim}

Arguments

- \texttt{DT, x, y} Coordinates of a curve containing a rectangle. Either as a list, \texttt{DT}, containing columns \texttt{x} and \texttt{y}.
- \texttt{minH} The minimum height of the rectangles.
- \texttt{minW} The minimum width of the rectangles.
- \texttt{maximize} How the rectangle should be selected. Currently, only "area" supported.
- \texttt{incl_negative} Should areas below the x-axis be considered?

Value

A \texttt{data.table}: The coordinates of a rectangle, from (0, 0), (1, 0), (1, 1), (0, 1), south-west clockwise, that is contained within the area of the chart for positive values only.

Examples

\begin{verbatim}
ahull(c(0, 1, 2, 3, 4), c(0, 1, 2, 0, 0))
\end{verbatim}

Description

These simple aliases can be useful to avoid operator precedence ambiguity, or to make use of indents from commas within your text editor. The all-caps versions accept single-length (capable of 'short-circuits') logical conditions only.

\texttt{Neithers} and \texttt{nors} are identical except have slightly different short-circuits. \texttt{NOR} uses negation once so may be quicker if the first argument is very, very prompt.
**all_same_sign**

**Usage**

- AND(x, y)
- OR(x, y)
- nor(x, y)
- neither(x, y)
- NOR(x, y)
- NEITHER(x, y)
- pow()
- XOR(x, y)

**Arguments**

- x, y Logical conditions.

---

**Description**

Present since hutils 1.2.0.

**Usage**

- all_same_sign(x)

**Arguments**

- x A numeric vector.

**Value**

TRUE if all elements of x have the same sign. Zero is a separate sign from positive and negative. All vectors of length-1 or length-0 return TRUE, even if x = NA, (since although the value is unknown, it must have a unique sign), and non-numeric x.
Examples

```r
all_same_sign(1:10)
all_same_sign(1:10 - 1)
all_same_sign(0)
all_same_sign(NA)
all_same_sign(c(NA, 1))
all_same_sign("surprise?")
all_same_sign(c(0, 0.1 + 0.2 - 0.3))
```

```r
if (requireNamespace("microbenchmark", quietly = TRUE)) {
  library(microbenchmark)
  microbenchmark(base = length(unique(sign(1:1e5), nmax = 3)) == 1L,
                  all_same_sign(1:1e5))
}
```

# Unit: microseconds
# expr  min  lq mean median  uq  max neval cld
# base 2012 2040 2322 2047 2063 9324 100  b
# all_same_sign(1:1e+05) 86 86 94 89 93 290 100  a

---

**any_grepl**

Does the pattern appear anywhere?

Description

Shortcut for `any(grepl(...))`, mostly for consistency.

Usage

```r
any_grepl(
  x,
  pattern,
  perl = TRUE,
  ignore.case = FALSE,
  fixed = FALSE,
  quiet = FALSE
)
```

Arguments

- `x` A character vector.
- `pattern`, `perl`, `ignore.case`, `fixed` As in `grep`.
- `quiet` (logical, default: FALSE) If TRUE, silences any messages.

Details

From version v 1.4.0, `any_grepl(a, bb)` will be internally reversed to `any_grepl(bb, a)` if `length(bb) > 1` and `length(a) == 1`. 
Examples

```r
any_grepl(c("A_D_E", "K0j"), "[a-z]")
```

---

table

<table>
<thead>
<tr>
<th>auc</th>
<th>AUC</th>
</tr>
</thead>
</table>

Description

Returns the area under the curve ("AUC") of a receiver-operating characteristic curve for the given predicted and actual values.

Usage

```r
auc(actual, pred)
```

Arguments

- `actual`: Logical vector: TRUE for positive class. If not a logical vector, the result is interpreted as one if safe to do so, viz. if `actual` contains precisely two unique values and is either a numeric vector, an ordered factor, or the unique values are FALSE and TRUE (case-insensitively). Anything else is an error.
- `pred`: Numeric (double) vector the same length as `actual` giving the predicted probability of TRUE. Must be a numeric vector the same length as `actual`.

Author(s)

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average_bearing

Source

Source code based on Metrics::auc from Ben Hamner and Michael Frasco and Erin LeDell from the Metrics package.

---

average_bearing Average of bearings

Description

Average of bearings

Usage

average_bearing(theta1, theta2, average_of_opposite = NULL)

average_bearing_n(thetas)

Arguments

theta1, theta2  Bearings, expressed in degrees.
average_of_opposite  The average of opposing bearings (e.g. average of north and south) is not well-defined. If NULL, the result for opposing vectors is undefined; if "right", returns theta1 + 90; if "left" then theta2 + 90. Can also be a single numeric to provide a specific value when the vectors point in opposite directions.

thetas  A vector of bearings.

Value

For ‘average_bearing’, the bearing bisecting the two bearings.
For ‘average_bearing_n’, the average bearing of the bearing.

Examples

average_bearing(0, 90)
average_bearing(0, 270)
average_bearing(90, 180)

average_bearing(0, 180)
average_bearing(0, 180, average_of_opposite = 3)
average_bearing(0, 180, average_of_opposite = "left")

average_bearing_n(1:179)
bearing

Bearing calculations

Description

Bearing calculations

Usage

bearing(lat_orig, lon_orig, lat_dest, lon_dest)

compass2bearing(compass)
easterly_component(compass)
northerly_component(compass)

Arguments

lat_orig, lon_orig, lat_dest, lon_dest
Latitude and longitude of origin and destination.

compass A character vector of compass rose points, such as c("NW", "E", "SSW").

Value

bearing An approximate bearing from _orig and _dest.
compass2bearing The bearing encoded by the compass input.
easterly_component The easterly component of a unit vector pointing in the direction provided.

Examples

bearing(0, 0, 90, 0)
bearing(-35, 151, 51, 0)

compass2bearing("NW")
easterly_component("E")
easterly_component("NW")
coalesce  \hspace{1cm} \textit{Find first non-missing element}

Description
Lightweight version of dplyr::coalesce, with all the vices and virtues that come from such an approach. Very similar logic (and timings to dplyr::coalesce), though no ability to use quosures etc. One exception is that if \( x \) does not contain any missing values, it is returned immediately, and ignores \ldots. For example, dplyr::coalesce(1:2, 1:3) is an error, but hutils::coalesce(1:2, 1:3) is not.

Usage
\begin{verbatim}
coalesce(x, ...)
\end{verbatim}

Arguments
\begin{itemize}
  \item \textbf{x} \hspace{1cm} \text{A vector}
  \item \textbf{...} \hspace{1cm} \text{Successive vectors whose values will replace the corresponding values in \( x \) if the value is (still) missing.}
\end{itemize}

Value
\begin{verbatim}
x with missing values replaced by the first non-missing corresponding elements in \ldots. That is, if \ldots = A, B, C and \( x[i] \) is missing, then \( x[i] \) is replaced by \( A[i] \). If \( x[i] \) is still missing (i.e. \( A[i] \) was itself NA), then it is replaced by \( B[i], C[i] \) until it is no longer missing or the list has been exhausted.
\end{verbatim}

Source
Original source code but obviously inspired by dplyr::coalesce.

Examples
\begin{verbatim}
coalesce(c(1, NA, NA, 4), c(1, 2, NA, NA), c(3, 4, 5, NA))
\end{verbatim}

---

dev_copy2a4  \hspace{1cm} \textit{Copy device to an A4 PDF}

Description
Simply a wrapper around dev.copy2pdf, but without the need to remember that an A4 sheet of paper is 8.27 in by 11.69 in.
Usage

dev_copy2a4(filename, ...)

Arguments

filename A string giving the name of the PDF file to write to, must end in .pdf.
...

Other parameters passed to pdf.

Value

As in dev2.

Description

(Windows only) Same as list.files but much faster.

Present since v1.4.0.

Usage

dir2(
  path = ".",
  file_ext = NULL,
  full.names = TRUE,
  recursive = TRUE,
  pattern = NULL,
  fixed = FALSE,
  perl = TRUE && missing(fixed) && !fixed,
  ignore.case = FALSE,
  invert = FALSE,
  .dont_use = FALSE
)

Arguments

path A string representing the trunk path to search within.
file_ext A string like '*.txt' or '*.csv' to limit the result to files with that extension.
full.names TRUE by default.
recursive TRUE by default.
pattern, perl, ignore.case, fixed, invert

As in grep but with different defaults. Used to filter files with extension file_ext.
.dont_use Only used for tests to simulate non-Windows systems.
### drop_col

**Drop column or columns**

**Description**

Drop column or columns

**Usage**

```r
drop_col(DT, var, checkDT = TRUE)
drop_cols(DT, vars, checkDT = TRUE)
```

**Arguments**

- `DT`: A `data.table`.
- `var`: Quoted column to drop.
- `checkDT`: Should the function check `DT` is a `data.table`?
- `vars`: Character vector of columns to drop. Only the intersection is dropped; if any `vars` are not in `names(DT)`, no warning is emitted.

**Value**

`DT` with specified columns removed.

**Examples**

```r
if (requireNamespace("data.table", quietly = TRUE)) {
  library(data.table)
  DT <- data.table(x = 1, y = 2, z = 3)
  drop_col(DT, "x")
}
```
### drop_colr

*Drop columns whose names match a pattern*

**Description**

- `drop_colr` present since hutils 1.0.0.
- `drop_grep` is identical but only present since hutils 1.2.0.

**Usage**

```r
drop_colr(DT, pattern, ..., checkDT = TRUE)
```

**Arguments**

- **DT**: A `data.table`.
- **pattern**: A regular expression as in `grep`.
- **...**: Arguments passed to `grep`.
- **checkDT**: If `TRUE` (the default), will error if `DT` is not a `data.table`.

**Examples**

```r
count <- 0
library(data.table)
dt <- data.table(x1 = rnorm(10), x2 = rnorm(10))
drop_colr(dt, p = 'x')
```

---

### drop_constant_cols

*Drop constant columns*

**Description**

Drops columns that have only one value in a `data.table`.

**Usage**

```r
drop_constant_cols(DT, copy = FALSE)
```

**Arguments**

- **DT**: A `data.table`.
- **copy** (logical, default: `FALSE`): Whether the `data.table` should be copied before any columns are dropped. If `FALSE`, the default, columns are dropped from `DT` by reference.
Details

If DT is a data.frame that is not a data.table, constant columns are still dropped, but since DT will be copied, copy should be set to TRUE to avoid a warning. If DT is a data.frame and all but one of the columns are constant, a data.frame will still be returned, as opposed to the values of the sole remaining column, which is the default behaviour of base data.frame.

If all columns are constant, drop_constant_cols returns a Null data table if DT is a data.table, but a data frame with 0 columns and nrow(DT) otherwise.

Examples

library(data.table)
X <- data.table(x = c(1, 1), y = c(1, 2))
drop_constant_cols(X)

-----------------------------

drop_empty_cols  Drop empty columns
-----------------------------

Description

Removes columns from a data.table where all the values are missing.

Usage

drop_empty_cols(DT, copy = FALSE)

Arguments

DT  A data.table.
copy  Copies the data.table so the original can be retained. Not applicable if DT is not a data.table. If FALSE, the default, DT itself will be modified.

-----------------------------

duplicated_rows  Return duplicated rows of data.table
-----------------------------

Description

This function differs from duplicated in that it returns both the duplicate row and the row which has been duplicated. This may prove useful in combination with the by argument for determining whether two observations are identical across more than just the specified columns.
Usage

duplicated_rows(
    DT,
    by = names(DT),
    na.rm = FALSE,
    order = TRUE,
    copyDT = TRUE,
    na.last = FALSE
)

Arguments

DT          A data.table.
by          Character vector of columns to evaluate duplicates over.
n.a.r.m     (logical) Should NAs in by be removed before returning duplicates? (Default FALSE.)
order       (logical) Should the result be ordered so that duplicate rows are adjacent? (Default TRUE.)
copyDT      (logical) Should DT be copied prior to detecting duplicates. If FALSE, the ordering of DT will be changed by reference.
n.a.last    (logical) If order is TRUE, should NAs be ordered first or last?. Passed to data.table:::setorderv.

Value

Duplicate rows of DT by by. For interactive use.

Examples

if (requireNamespace("data.table", quietly = TRUE)) {
  library(data.table)

  DT <- data.table(x = rep(1:4, 3),
                   y = rep(1:2, 6),
                   z = rep(1:3, 4))

  # No duplicates
  duplicated_rows(DT)

  # x and y have duplicates
  duplicated_rows(DT, by = c("x", "y"), order = FALSE)

  # By default, the duplicate rows are presented adjacent to each other.
  duplicated_rows(DT, by = c("x", "y"))
}
find_pattern_in  

Find string pattern in (text) file

Description

goto_pattern_in present from 1.6.0

Usage

```r
find_pattern_in(
  file_contents,
  basedir = ".",
  dir_recursive = TRUE,
  reader = readLines,
  include.comments = FALSE,
  comment.char = NULL,
  use.OS = FALSE,
  file_pattern = "\.(R|r)(nw|md)?$",
  file_contents_perl = TRUE,
  file_contents_fixed = FALSE,
  file_contents_ignore_case = FALSE,
  file.ext = NULL,
  which_lines = c("first", "all")
)
```

goto_pattern_in(file_contents, ...)

Arguments

- **file_contents**: A perl-regular expression as a search query.
- **basedir**: The root of the directory tree in which files will be searched recursively.
- **dir_recursive**: (logical, default: TRUE) Search within subdirectories of basedir?
- **reader**: A function, akin to `base::readLines`, the default, that accepts a filename and returns a character vector.
- **include.comments**: If FALSE, the default, comments (i.e. anything after a \#) are not searched.
- **comment.char**: If include.comments is FALSE, what character marks a comment character? By default, NULL, which sets the correct comment symbol for R and TeX files.
- **use.OS**: Use the operating system to determine file list. Only available on Windows. If it fails, a fall-back option (using dir) is used.
- **file_pattern**: A regular expression passed to `list.files(pattern = file.ext)`. By default, "\.(R|r)(nw|md)?$", i.e. all R and Sweave files. (Does not have to be a file extension.)
- **file_contents_perl**: (logical, default: TRUE) Should file_contents be interpreted as a perl regex?
**file_contents_fixed**
(logical, default: FALSE) Should `file_contents` be interpreted as a fixed regex?

**file_contents_ignore_case**
(logical, default: FALSE) As in `grep`.

**file.ext** A file extension passed to the operating system if `use.OS` is used.

**which_lines** One of "first" and "all". If "first" only the first match in any file is returned in the result; if "all", all matches are.

... Arguments passed to `find_pattern_in`.

**Details**
For convenience, if `file_contents` appears to be a directory and `basedir` does not, the arguments are swapped, but with a warning.

**Value**
A `data.table`, showing the matches per file.
`goto_pattern_in` additionally prompts for a row of the returned results. Using the `rstudioapi`, if available, RStudio will jump to the file and line number.

---

**fst_columns**
Utilities for ‘fst’ files

**Description**
Utilities for ‘fst’ files

**Usage**
fst_columns(file.fst)
fst_nrow(file.fst)

**Arguments**
file.fst Path to file.

**Value**
Various outputs:

fst_columns Returns the names of the columns in `file.fst`.
fst_nrow Returns the number of rows in `file.fst`. 
generate_LaTeX_manual  Generate LaTeX manual of installed package

Description
Generate LaTeX manual of installed package

Usage
generate_LaTeX_manual(pkg, launch = TRUE)

Arguments
pkg Quoted package name (must be installed).
launch Should the PDF created be launched using the viewer (TRUE by default)?

Value
See system. Called for its side-effect: creates a PDF in the current working directory. Requires a TeX distribution.

Source
https://stackoverflow.com/a/30608000/1664978

haversine_distance  Distance between two points on the Earth

Description
Distance between two points on the Earth

Usage
haversine_distance(lat1, lon1, lat2, lon2)

Arguments
lat1, lon1, lat2, lon2
That latitudes and longitudes of the two points.

Details
This is reasonably accurate for distances in the order of 1 to 1000 km.
**if_else**

**Value**

The distance in kilometres between the two points.

**Examples**

```r
# Distance from YMEL to YSSY
haversine_distance(-37 - 40/60, 144 + 50/60, -33 - 56/60, 151 + 10/60)

```

**Description**

Lightweight `dplyr::if_else` with the virtues and vices that come from such an approach. Attempts to replicate `dplyr::if_else` but written in base R for faster compile time. `hutils::if_else` should be faster than `dplyr::if_else`... when it works, but will not work on lists or on factors. Additional attributes may be dropped.

**Usage**

```r
if_else(condition, true, false, missing = NULL)
```

**Arguments**

- `condition` Logical vector.
- `true, false` Where condition is TRUE/FALSE, use the corresponding true/no value. They must have the same `typeof` as each other and be the same length as condition or length-one.
- `missing` If condition is NA, use the corresponding na value. Likewise true and false, must be of the same type and have the same length as condition, unless it has length one.

**Details**

If the result is expected to be a factor then the conditions for type safety are strict and may be made stricter in future.

**Value**

Where condition is TRUE, the corresponding value in true; where condition is FALSE, the corresponding value in false. Where condition is NA, then the corresponding value in na – unless na is NULL (the default) in which case the value will be NA (with the same type as true.)

**Source**

Original code but obviously heavily inspired by [https://CRAN.R-project.org/package=dplyr](https://CRAN.R-project.org/package=dplyr).
implies  

#' Logical implies

Description

Returns the result of \( x \implies y \).

Usage

\[ \text{implies}(x, y) \]

\[ x \%\text{implies}\% y \]

Arguments

\( x, y \)  
Logical vectors of the same length.

Value

Logical implies: TRUE unless \( x \) is TRUE and \( y \) is FALSE.

NA in either \( x \) or \( y \) results in NA if and only if the result is unknown. In particular \( \text{NA} \%\text{implies}\% \text{TRUE} \) is TRUE and \( \text{FALSE} \%\text{implies}\% \text{NA} \) is TRUE.

If \( x \) or \( y \) are length-one, the function proceeds as if the length-one vector were recycled to the length of the other.

Examples

\[ \text{library(data.table)} \]
\[ \text{CJ(x = c(TRUE, FALSE),}
\]
\[ \text{y = c(TRUE, FALSE))[, `x => y` := x %implies% y][]} \]

\[ #> \begin{array}{ccc}
\text{ x } & \text{ y } & \text{x => y} \\
\hline
\text{ 1: FALSE FALSE TRUE} \\
\text{ 2: FALSE TRUE TRUE} \\
\text{ 3: TRUE FALSE FALSE} \\
\text{ 4: TRUE TRUE TRUE} \\
\text{ 5: NA NA NA} \\
\text{ 6: NA FALSE NA} \\
\text{ 7: NA TRUE TRUE} \\
\text{ 8: FALSE NA TRUE} \\
\text{ 9: TRUE NA NA} \\
\end{array} \]

# NA results:

\[ #> 5: \text{ NA NA NA} \]
\[ #> 6: \text{ NA FALSE NA} \]
\[ #> 7: \text{ NA TRUE TRUE} \]
\[ #> 8: \text{ FALSE NA TRUE} \]
\[ #> 9: \text{ TRUE NA NA} \]
**isAttached**

Is a package attached?

**Usage**

isAttached(pkg)

**Arguments**

pkg Either character or unquoted.

**Value**

TRUE if pkg is attached.

---

**isTrueFalse**

Logical assertions

**Description**

Logical assertions

**Usage**

isTrueFalse(x)

**Arguments**

x An object whose values are to be checked.

**Value**

For isTrueFalse, TRUE if and only if x is TRUE or FALSE identically (perhaps with attributes).
Description

Longest common prefix/suffix

Usage

trim_common_affixes(
  x,
  .x = NULL,
  na.rm = TRUE,
  prefixes = TRUE,
  suffixes = TRUE,
  warn_if_no_prefix = TRUE,
  warn_if_no_suffix = TRUE
)

longest_suffix(x, .x = NULL, na.rm = TRUE, warn_if_no_suffix = TRUE)

longest_prefix(x, .x = NULL, na.rm = TRUE, warn_if_no_prefix = TRUE)

Arguments

x A character vector.
.x If NULL, the default, ignored. May be used if x is known to be free of NAs.
na.rm (logical, default: TRUE) If FALSE, an NA in x means "" is the only common affix. If NA, the longest prefix/suffix is NA_character_ (provided anyNA(x)). If anyNA(x) == FALSE na.rm has no effect.
prefixes (logical, default: TRUE) If TRUE, trim prefixes.
suffixes (logical, default: TRUE) If TRUE, trim suffixes.
warn_if_no_prefix, warn_if_no_suffix (logical, default: TRUE) If FALSE, if x has no common affixes the warning is suppressed. (If no common prefix/suffix then the common affix returned will be "" (the empty string).)

Value

The longest common substring in x either at the start or end of each string. For trim_common_affixes x with common prefix and common suffix removed.

Examples

longest_prefix(c("totalx", "totaly", "totalz"))
longest_suffix(c("ztotal", "ytotal", "xtotal"))
**mean_na**  

*Proportion of values that are NA.*

**Description**

Proportion of values that are NA.

**Usage**

`mean_na(v)`

**Arguments**

`v`  
A vector.

**Value**

A double, `mean(is.na(v))`.

---

**Mode**  

*Statistical mode*

**Description**

Present since `hutils` 1.4.0. The most common element.

**Usage**

`Mode(x)`

**Arguments**

`x`  
A vector for which the mode is desired.

**Value**

The most common element of `x`.

If the mode is not unique, only one of these values is returned, for simplicity.

If `x` has length zero, `Mode(x) = x`. 
mutate_ntile  

Add a column of ntiles to a data table

Description

Add a column of ntiles to a data table

Usage

mutate_ntile(
  DT,
  col,
  n,
  weights = NULL,
  by = NULL,
  keyby = NULL,
  new.col = NULL,
  character.only = FALSE,
  overwrite = TRUE,
  check.na = FALSE
)

Arguments

DT  A data.table.

col  The column name (quoted or unquoted) for which quantiles are desired.

n  A positive integer, the number of groups to split col.

weights  If NULL, the default, use unweighted quantiles. Otherwise, a string designating the column that is passed to weighted_ntile.

by, keyby  Produce a grouped quantile column, as in data.table. keyby will set a key on the result (i.e. order by keyby).

new.col  If not NULL, the name of the column to be added. If NULL (the default) a name will be inferred from n. (For example, n = 100 will be <col>Percentile).

character.only (logical, default: FALSE) Do not contemplate col to be an unquoted column name.

overwrite (logical, default: TRUE) If TRUE and new.col already exists in DT, the column will be overwritten. If FALSE, attempting to overwrite an existing column is an error.

check.na (logical, default: FALSE) If TRUE, NAs in DT[[col]] will throw an error. If NA’s are present, the corresponding n-tile may take any value.

Value

DT with a new integer column new.col containing the quantiles. If DT is not a data.table its class may be preserved unless keyby is used, where it will always be a data.table.
mutate_other

Examples

```r
library(data.table)
DT <- data.table(x = 1:20, y = 2:1)
mutate_ntile(DT, "x", n = 10)
mutate_ntile(DT, "x", n = 5)
mutate_ntile(DT, "x", n = 10, by = "y")
mutate_ntile(DT, "x", n = 10, keyby = "y")

y <- "x"
DT <- data.table(x = 1:20, y = 2:1)
mutate_ntile(DT, y, n = 5) # Use DT$y
mutate_ntile(DT, y, n = 5, character.only = TRUE) # Use DT$x
```

mutate_other  

Group infrequent entries into 'Other category'

Description

Useful when you want to constrain the number of unique values in a column by keeping only the most common values.

Usage

```r
mutate_other(
  .data,
  var,
  n = 5,
  count,
  by = NULL,
  var.weight = NULL,
  mass = NULL,
  copy = TRUE,
  other.category = "Other"
)
```

Arguments

- `.data`: Data containing variable.
- `var`: Variable containing infrequent entries, to be collapsed into "Other".
- `n`: Threshold for total number of categories above "Other".
- `count`: Threshold for total count of observations before "Other".
- `by`: Extra variables to group by when calculating n or count.
- `var.weight`: Variable to act as a weight: var’s where the sum of this variable exceeds mass will be kept, others set to `other.category`.
mass

Threshold for sum of var.weight: any var where the aggregated sum of var.weight exceeds mass will be kept and other var will be set to other.category. By default (mass = NULL), the value of mass is \(-\infty\), with a warning. You may set it explicitly to \(-\text{Inf}\) if you really want to avoid a warning that this function will have no effect.

copy

Should .data be copied? Currently only TRUE is supported.

other.category

Value that infrequent entries are to be collapsed into. Defaults to "Other".

Value

.data but with var changed so that infrequent values have the same value (other.category).

Examples

```r
library(data.table)
library(magrittr)

DT <- data.table(City = c("A", "A", "B", "B", "C", "D"),
                 value = c(1, 9, 4, 4, 5, 11))

DT %>%
      mutate_other("City", var.weight = "value", mass = 10) %>%
      .[]
```

ngrep

Anti-grep

Description

It is not simple to negate a regular expression. This obviates the need takes the long way round: negating the corresponding grepl call.

Usage

```r
ngrep(pattern, x, value = FALSE, ...)
```

Arguments

x, value, pattern

As in grep.

... Arguments passed to grepl.

Value

If value is FALSE (the default), indices of x which do not match the pattern; if TRUE, the values of x themselves.
Examples

```r
grep("[a-h]", letters)
ngrep("[a-h]", letters)

txt <- c("The", "licenses", "for", "most", "software", "are",
"designed", "to", "take", "away", "your", "freedom",
"to", "share", "and", "change", "it.",
"", "By", "contrast," "the", "GNU", "General", "Public", "License",
"is", "intended", "to", "guarantee", "your", "freedom", "to",
"share", "and", "change", "free", "software", "--",
"to", "make", "sure", "the", "software", "is",
"free", "for", "all", "its", "users")

grep("[gu]", txt, value = TRUE)
ngrep("[gu]", txt, value = TRUE)
```

---

**prohibit_unequal_length_vectors**

*Prohibit unequal length vectors*

**Description**

Tests whether all vectors have the same length.

**Usage**

```r
prohibit_unequal_length_vectors(...)```

**Arguments**

```r
...  Vectors to test.
```

**Value**

An error message unless all of ... have the same length in which case NULL, invisibly.

---

**prohibit_vector_recycling**

*Prohibit vector recycling*

**Description**

Tests (harshly) whether the vectors can be recycled safely.
provide.dir

Usage
provide_dir(...)
**provide.file**

*Provide a file*

**Description**

Present since hutils v1.5.0.

**Usage**

```r
provide.file(path, on_failure = "")
```

**Arguments**

- **path**: A string. The path to a filename that requires existence.
- **on_failure**: The return value on failure. By default, an empty string.

**Value**

`path` for success. Or `on_failure` if the path cannot be provided.

---

**replace_pattern_in**

*Replace string pattern in text file*

**Description**

Replace string pattern in text file

**Usage**

```r
replace_pattern_in(file_contents, replace, basedir = ".", dir_recursive = TRUE, reader = readLines, file_pattern = "\.(R|r)(nw|md)?$", file_contents_perl = TRUE, file_contents_fixed = FALSE, file_contents_ignore_case = FALSE, writer = writeLines)
```
Arguments

- **file_contents**: Character string containing a regular expression to be matched in the given character vector. Passed to `pattern` in `gsub`.
- **replace**: The replacement, passed to `replacement` in `gsub`.
- **basedir**: The root of the directory tree in which files will be searched recursively.
- **dir_recursive**: (logical, default: `TRUE`) Search within subdirectories of `basedir`?
- **reader**: A function, akin to `base::readLines`, the default, that accepts a filename and returns a character vector.
- **file_pattern**: A regular expression passed to `list.files(pattern = file.ext)`. By default, `"\.(R|r)(nw|md)\$"`, i.e. all R and Sweave files. (Does not have to be a file extension.)
- **file_contents_perl**: (logical, default: `TRUE`) Should `file_contents` be interpreted as a perl regex?
- **file_contents_fixed**: (logical, default: `FALSE`) Should `file_contents` be interpreted as a fixed regex?
- **file_contents_ignore_case**: (logical, default: `FALSE`) As in `grep`.
- **writer**: A function that will rewrite the file from the character vector read in.

---

**report_error**

Report errors and warnings

Description

Provides a consistent style for errors and warnings.

Usage

```r
report_error(
  faulty_input,  # Required argument
  error_condition,  # Required argument
  requirement,  # Required argument
  context = NULL,  # Optional argument
  advice,  # Optional argument
  hint = NULL,  # Optional argument
  halt = TRUE  # Optional argument
)
```
Arguments

faulty_input  Unquoted function argument that is the cause of the error condition.
error_condition  A sentence explaining the condition that invoked the error.
requirement  A sentence that explains what is required.
context  (Optional) A sentence that contextualizes the error
advice  Advice for the user to avoid the error.
hint  If the input can be guessed.
halt  (logical, default: TRUE) Should the function signal an error and halt?

RQ  Shorthand for requireNamespace

Description

Present since hutils v1.2.0. Alias for if (!requireNamespace(pkg, quietly = TRUE)) yes else no. Typical use-case would be RQ(pkg, install.packages("pkg"))].

Default values for yes and no from hutils v1.5.0.

This function is not recommended for use in scripts as it is a bit cryptic; its use-case is for bash scripts and the like where calls like this would otherwise be frequent and cloud the message.

Usage

RQ(pkg, yes = NULL, no = NULL)

Arguments

pkg  Package to test whether the package is not yet installed.
yes  Response if pkg is not installed.
no  (optional) Response if pkg is installed.

Examples

## Not run:
RQ("dplyr", "dplyr needs installing")

## End(Not run)
**samp**  
*Safer sampler*

**Description**

Present since hutils v1.4.0. Same as `sample`, but avoiding the behaviour when `length(x) == 1L`.

**Usage**

```r
samp(x, size = length(x), replace = size > length(x), loud = TRUE, prob = NULL)
```

**Arguments**

- `x`  
  A vector.
- `size`  
  A non-negative integer, the number of items to return.
- `replace`  
  Should the sampling be done with replacement? Defaults to `TRUE` if `size > length(x)`, with a message.
- `loud`  
  If `TRUE`, the default, any behaviour known to be different from `sample` is flagged with a message.
- `prob`  
  As in `sample`.

**Examples**

```r
samp(1:5)
sample(1:5)

samp(1:5, size = 10)  # no error
tryCatch(sample(1:5, size = 10),
  error = function(e) print(e$m))

samp(5, size = 3)
sample(5, size = 3)
```

---

**selector**  
*Fast selection of data.table columns*

**Description**

Present since hutils 1.2.0.

**Usage**

```r
selector(DT, ..., cols = NULL, preserve.key = TRUE, shallow = FALSE)
```
select_grep

Arguments

- **DT**  
  A data.table.

- **cols**  
  Character vector of column names.

- **preserve.key**  
  (logical, default: TRUE) Reapply the key (if DT has one)?

- **shallow**  
  (logical, default: FALSE) Should the result be a shallow copy of DT’s columns or should the columns be assigned by reference? If TRUE, any modification to the result also modifies the selected columns in DT.

Value

DT with the selected columns.

Examples

```r
RQ("nycflights13", no = {
  library(nycflights13)
  library(data.table)
  fs <- as.data.table(flights)
  fs1 <- selector(fs, year, month, day, arr_delay)
  fs1[, arr_delay := NA]
})
```

select_grep  
Select names matching a pattern

Description

Select names matching a pattern

Usage

```r
select_grep(
  DT,
  patterns,
  .and = NULL,
  .but.not = NULL,
  ignore.case = FALSE,
  perl = TRUE,
  fixed = FALSE,
  useBytes = FALSE,
  invert = FALSE,
  .warn.fixed.mismatch = TRUE
)
```
Arguments

**DT**
A data.frame.

**patterns**
Regular expressions to be matched against the names of DT. If length(patterns) > 1 the patterns are concatenated using alternation.

**.and**
Character or integer positions of names to select, regardless of whether or not they are matched by patterns.

**.but.not**
Character or integer positions of names to drop, regardless of whether or not they are matched by patterns or whether they are explicitly added by .and.

**ignore.case, perl, fixed, useBytes, invert**
Arguments passed to grep. Note that perl = TRUE by default (unlike grep) unless fixed = TRUE (and perl is missing).

**.warn.fixed.mismatch**
(logical, default: TRUE) If TRUE, the default, selecting fixed = TRUE with perl = TRUE or ignore.case = TRUE results in perl and ignore.case being reset to FALSE with a warning (as in grep), even if it makes no difference to the columns eventually selected. If FALSE unambiguous results are allowed; if ignore.case = TRUE and fixed = TRUE, the result is **unambiguous** if select_grep(DT, tolower(patterns), fixed = TRUE) and select_grep(DT, toupper(patterns), fixed = TRUE) are identical.

Value

DT with the selected names.

integer vector of positions

Examples

```r
library(data.table)
dt <- data.table(x1 = 1, x2 = 2, y = 0)
select_grep(dt, "x")
select_grep(dt, "x", .and = "y")
select_grep(dt, "x", .and = "y", .but.not = "x2")
```

---

**select_which**

Select columns satisfying a condition

Description

Select columns satisfying a condition

Usage

```r
select_which(DT, Which, .and.dots = NULL, checkDT = TRUE, .and.grep = NULL)
```
Arguments

DT
    A data.table.
Which
    A function that takes a vector and returns TRUE or FALSE. TRUE columns are
    selected.
.and.dots
    Optional extra columns to include. May be a character vector of names(DT) or
    numeric (positions) or logical. If provided, the columns so added (if they do not
    satisfy Which) will be after all the columns Which do so satisfy.
checkDT
    If TRUE (the default), an informative error message is provided if DT is not a
    data.table.
.and.grep
    A character vector of regular expressions to match to the names of DT. The cor-
    responding columns will be included in the result.

Value

DT with the selected variables.

Examples

library(data.table)
DT <- data.table(x = 1:5,
    y = letters[1:5],
    AB = c(NA, TRUE, FALSE))
select_which(DT, anyNA, .and.dots = "y")

---

seq_nrow

Generate sequence of row numbers

Description

Generate sequence of row numbers

Usage

seq_nrow(x)

Arguments

x
    An object that admits an nrow.

Value

Equivalent to seq_len(nrow(x))
Description

Reorder columns of a data.table (via setcolorder) so that particular columns appear first (or last), or in a particular order.

Usage

\begin{verbatim}
set_cols_first(DT, cols, intersection = TRUE)
set_cols_last(DT, cols, intersection = TRUE)
set_colsuborder(DT, cols, intersection = TRUE)
\end{verbatim}

Arguments

- **DT**: A data.table.
- **cols**: Character vector of columns to put before (after) all others or, in the case of set_colsuborder, a vector of columns in the order requested.
- **intersection**: Use the intersection of the names of DT and cols. If FALSE any cols are not the names of DT, the function may error on behalf of data.table. Not available for set_colsuborder.

Details

In the case of set_colsuborder the group of columns cols occupy the same positions in DT but in a different order. See examples.

Examples

\begin{verbatim}
library(data.table)
DT <- data.table(y = 1:5, z = 11:15, x = letters[1:5])
set_cols_first(DT, "x")[]
set_cols_last(DT, "x")[]
set_colsuborder(DT, c("x", "y"))[]
\end{verbatim}
Description

Swap values simultaneously. Present since hutils 1.4.0.

Usage

x %<->% value

Arguments

x, value  
Objects whose values are to be reassigned by swapping.

Value

NULL invisibly. Called for its side-effect: the values of x and value are swapped. So

x %<->% value

is equivalent to

temp <- x  
x <- value  
value <- temp  
rm(temp)

Examples

a <- 1  
b <- 2  
a %<->% b  
a  
b
### Switch

**Vectorized switch**

**Description**

Present since hutils 1.2.0. Vectorized version of switch. Used to avoid or make clearer the result of `if_else(Expr == , ..1, if_else(Expr == , ..2, ...))`

**Usage**

```
Switch(Expr, ..., DEFAULT, IF_NA = NULL, MUST_MATCH = FALSE)
```

**Arguments**

- **Expr**
  - A character vector.
- **...**
  - As in `switch`, a list of named alternatives. Unlike `switch`, unnamed vectors are taken to match "". Likewise, NA values in `Expr` must be assigned via `IF_NA`.
- **DEFAULT**
  - A mandatory default value should any name of ... be left unmatched.
- **IF_NA**
  - Optional value to replace missing (NA_character_) values in `Expr`.
- **MUST_MATCH**
  - (logical, default: FALSE) Must every value in `Expr` be matched by a conversion in ...? If TRUE any output equal to the value of `DEFAULT` is an error.

**Value**

For every element of ... whose name matches an element of `Expr`, that element’s value.

**Examples**

```
Switch(c("a", "b", "c", "a"),
   "a" = 1,
   "b" = 2,
   "c" = 3,
   "4" = 4,
   DEFAULT = 0)
```

### unique-keys

**Unique keys**

**Description**

A data.table’s key need not be unique, but there are frequently circumstances where non-unique keys can wreak havoc. has_unique_key reports the existence of a unique key, and set_unique_key both sets and ensures the uniqueness of keys.
**Usage**

has_unique_key(DT)

set_unique_key(DT, ...)

**Arguments**

<table>
<thead>
<tr>
<th>DT</th>
<th>A data.table</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>keys to set</td>
</tr>
</tbody>
</table>

**Value**

has_unique_key returns TRUE if DT has a unique key, FALSE otherwise. set_unique_key runs setkey(DT, ...) then checks whether the key is unique, returning the keyed data.table if the key is unique, or an error message otherwise.

---

**weight2rows**

Expand a weighted data frame to an equivalent unweighted

**Description**

Present since v1.0.0. Argument rows.out available since v1.3.0; rows.out < 1 supported since v1.4.0. Argument discard_weight.var available since v1.3.0.

weight2rows(DT, weight.var, rows.out = NULL, discard_weight.var = FALSE)

**Arguments**

<table>
<thead>
<tr>
<th>DT</th>
<th>A data.table. Will be converted to one if possible.</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight.var</td>
<td>Variable in DT to be used as weights.</td>
</tr>
<tr>
<td>rows.out</td>
<td>If not NULL (the default) specifies the number of rows in the result; otherwise the number of rows will be sum(DT[[weight.var]]). (Due to rounding, this figures are inexact.) Since v1.4.0, if 0 &lt; rows.out &lt; 1 then taken to be a sample of the unweighted table. (So rows.out = 0.1 would give a 10% sample.)</td>
</tr>
<tr>
<td>discard_weight.var</td>
<td>If FALSE, the default, weight.var in DT will be 1 for each row in the result or a new weight if rows.out is given. Otherwise, TRUE drops the column entirely.</td>
</tr>
</tbody>
</table>

**Value**

DT but with the number of rows expanded to sum(DT[[weight.var]]) to reflect the weighting.
Examples

```r
library(data.table)
DT <- data.table(x = 1:5, y = c(1, 1, 1, 1, 2))
weight2rows(DT, "y")
weight2rows(DT, "y", rows.out = 5)
```

weighted_ntile
Weighted (ranked) quantiles

Description
Weighted (ranked) quantiles

Usage

```r
weighted_ntile(vector, weights = rep(1, times = length(vector)), n)
```

Arguments

- **vector**: The vector for which quantiles are desired.
- **weights**: The weights associated with the vector. None should be NA or zero.
- **n**: The number of quantiles desired.

Details
With a short-length vector, or with weights of a high variance, the results may be unexpected.

Value
A vector of integers corresponding to the ntiles. (As in dplyr::ntile.)

Examples

```r
weighted_ntile(1:10, n = 5)
weighted_ntile(1:10, weights = c(rep(4, 5), rep(1, 5)), n = 5)
```
### weighted_quantile

**Description**

Quantile when the values are weighted

**Usage**

```r
weighted_quantile(v, w = NULL, p = (0:4)/4, v_is_sorted = FALSE)
```

**Arguments**

- `v`: A vector from which sample quantiles are desired.
- `w`: Weights corresponding to each `v`.
- `p`: Numeric vector of probabilities. Missing values or values outside [0, 1] raise an error.
- `v_is_sorted`: (logical, default: FALSE) If TRUE, ordering `v` is assumed to be sorted. Only set to TRUE when it is certain that `v` is sorted (as within groups of tables).

**Value**

A vector the same length as `p`, the quantiles corresponding to each element of `p`.

### %ein%

**Description**

A common blunder in R programming is to mistype one of a set of filters without realizing. This function will error if any member of the values to be matched against is not present.

**Usage**

```r
lhs %ein% rhs
```

- `lhs`: Values to be matched
- `rhs`: Values to be matched against.
Value

Same as `%in%` and `%notin%`, unless an element of rhs is not present in lhs, in which case, an error.

Examples

```r
# Incorrectly assumed to include two Species
iris[iris$Species %in% c("setosa", "versicolour"), ]
## Not run:
# Error:
iris[iris$Species %ein% c("setosa", "versicolour"), ]
## End(Not run)
```

%notchin%

Negation of in (character)

Description

Negation of in (character)

Usage

```r
x %notchin% y
```

Arguments

- `x` Values to be matched.
- `y` Values to be matched against.

Details

If `y` is `NULL`, then `x` is `TRUE` for consistency with `%in%`. If `x` and `y` are not both character, the function simply falls back to `%in%` rather than erroring.

%notin%

Negation of in

Description

Negation of in

Usage

```r
x %notin% y
```
Arguments

x  Values to be matched
y  Values to be matched against.

Details

If y is NULL, then x is TRUE for consistency with %in%. Note that the function uses fmatch internally for performance on large y. Accordingly, y will be modified by adding a .match.hash attribute and thus must not be used in packages where y is a constant, or for things like names of data.table.

%pin%

Description

Analogue of %in% but indicating partial match of the left operand.

Usage

x %pin% Y

Arguments

x  The values to be matched. Same as %in%.
Y  A vector of values (perl regular expressions) to be matched against.

Value

TRUE for every x for which any grepl is TRUE.

Examples

x <- c("Sydney Airport", "Melbourne Airport")
x %pin% c("Syd", "Melb")
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