

# Package ‘statnet.common’

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**Title** Common R Scripts and Utilities Used by the Statnet Project Software

**Description** Non-statistical utilities used by the software developed by the Statnet Project. They may also be of use to others.

**Imports** utils, methods, coda

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all_identical	<i>Test if all items in a vector or a list are identical.</i>
---------------	---

---

## Description

Test if all items in a vector or a list are identical.

## Usage

```
all_identical(x)
```

## Arguments

x	a vector or a list
---	--------------------

## Value

TRUE if all elements of x are identical to each other.

## See Also

[identical](#)

## Examples

```
stopifnot(!all_identical(1:3))

stopifnot(all_identical(list("a", "a", "a")))
```

---

as.rle	<i>Coerce to <b>rle</b> if not already an <b>rle</b> object.</i>
--------	--

---

### Description

Coerce to **rle** if not already an **rle** object.

### Usage

```
as.rle(x)

## S3 method for class 'rle'
as.rle(x)

## Default S3 method:
as.rle(x)
```

### Arguments

x	the object to be coerced.
---	---------------------------

---

check.control.class	<i>Check if the class of the control list is one of those that can be used by the calling function</i>
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---

### Description

This function can be called to check that the control list passed is appropriate for the function to be controlled. It does so by looking up the class of the control argument (defaulting to the control variable in the calling function) and checking if it matches a list of acceptable classes.

### Usage

```
check.control.class(OKnames = {      sc <- sys.calls()
  as.character(sc[[length(sc) - 1]][[1]]) }, myname = {      sc <- sys.calls()
  as.character(sc[[length(sc) - 1]][[1]]) }, control = get("control", pos =
parent.frame()))
```

### Arguments

OKnames	List of control function names which are acceptable.
myname	Name of the calling function (used in the error message).
control	The control list. Defaults to the control variable in the calling function.

### Note

In earlier versions, OKnames and myname were autodetected. This capability has been deprecated and results in a warning issued once per session. They now need to be set explicitly.

**See Also**

set.control.class, print.control.list

---

compress.data.frame     *"Compress" a data frame.*

---

**Description**

compress.data.frame "compresses" a data frame, returning unique rows and a tally of the number of times each row is repeated, as well as a permutation vector that can reconstruct the original data frame. decompress.data.frame reconstructs the original data frame.

**Usage**

```
compress.data.frame(x)
```

```
decompress.data.frame(x)
```

**Arguments**

x                      For compress.data.frame a [data.frame](#) to be compressed. For decompress.data.frame a [list](#) as returned by compress.data.frame.

**Value**

For compress.data.frame, a [list](#) with three elements:

rows	Unique rows of x
frequencies	A vector of the same length as the number of rows, giving the number of times the corresponding row is repeated
ordering	A vector such that if c is the compressed data frame, c\$rows[c\$ordering,,drop=FALSE] equals the original data frame, except for row names
rownames	Row names of x

For decompress.data.frame, the original data frame.

**See Also**

[data.frame](#)

**Examples**

```
(x <- data.frame(V1=sample.int(3,30,replace=TRUE),
                 V2=sample.int(2,30,replace=TRUE),
                 V3=sample.int(4,30,replace=TRUE)))

(c <- compress.data.frame(x))

stopifnot(all(decompress.data.frame(c)==x))
```

---

compress_rows	<i>A generic function to compress a row-weighted table</i>
---------------	--

---

### Description

Compress a matrix or a data frame with duplicated rows, updating row weights to reflect frequencies, or reverse the process, reconstructing a matrix like the one compressed (subject to permutation of rows and weights not adding up to an integer).

### Usage

```
compress_rows(x, ...)
```

```
decompress_rows(x, target.nrows = NULL, ...)
```

### Arguments

x	a weighted matrix or data frame.
...	extra arguments for methods.
target.nrows	the approximate number of rows the uncompressed matrix should have; if not achievable exactly while respecting proportionality, a matrix with a slightly different number of rows will be constructed.

### Value

For `compress_rows` A weighted matrix or data frame of the same type with duplicated rows removed and weights updated appropriately.

---

control.list.accessor	<i>Named element accessor for ergm control lists</i>
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---

### Description

Utility method that overrides the standard '\$' list accessor to disable partial matching for ergm `control.list` objects

### Usage

```
## S3 method for class 'control.list'
object$name
```

### Arguments

object	list-coerceable object with elements to be searched
name	literal character name of list element to search for and return

### Details

Executes `getElement` instead of `$` so that element names must match exactly to be returned and partially matching names will not return the wrong object.

**Value**

Returns the named list element exactly matching name, or NULL if no matching elements found

**Author(s)**

Pavel N. Krivitsky

**See Also**

see [getElement](#)

---

control.remap	<i>Overwrite control parameters of one configuration with another.</i>
---------------	--

---

**Description**

Given a `control.list`, and two prefixes, `from` and `to`, overwrite the elements starting with `to` with the corresponding elements starting with `from`.

**Usage**

```
control.remap(control, from, to)
```

**Arguments**

<code>control</code>	An object of class <code>control.list</code> .
<code>from</code>	Prefix of the source of control parameters.
<code>to</code>	Prefix of the destination of control parameters.

**Value**

An `control.list` object.

**Author(s)**

Pavel N. Krivitsky

**See Also**

[print.control.list](#)

**Examples**

```
(l <- set.control.class("test", list(a.x=1, a.y=2)))
control.remap(l, "a", "b")
```

---

despace	<i>A one-line function to strip whitespace from its argument.</i>
---------	---

---

**Description**

A one-line function to strip whitespace from its argument.

**Usage**

despace(s)

**Arguments**

s                      a character vector.

**Examples**

```
stopifnot(despace("\n \t ")=="")
```

---

ERRVL	<i>Return the first argument passed (out of any number) that is not a try-error (result of <a href="#">try</a> encountering an error).</i>
-------	--

---

**Description**

This function is inspired by [NVL](#), and simply returns the first argument that is not a try-error, raising an error if all arguments are try-errors.

**Usage**

ERRVL(...)

**Arguments**

...                      Expressions to be tested; usually outputs of [try](#).

**Value**

The first argument that is not a try-error. Stops with an error if all are.

**Note**

This function uses lazy evaluation, so, for example `ERRVL(1, stop("Error!"))` will never evaluate the `stop` call and will not produce an error, whereas `ERRVL(try(solve(0)), stop("Error!"))` would.

In addition, all expressions after the first may contain a `.`, which is substituted with the try-error object returned by the previous expression.

**See Also**

[try](#), [inherits](#)

## Examples

```

print(ERRVL(1,2,3)) # 1
print(ERRVL(try(solve(0)),2,3)) # 2
print(ERRVL(1, stop("Error!"))) # No error

## Not run:
# Error:
print(ERRVL(try(solve(0), silent=TRUE),
            stop("Error!")))

# Error with an elaborate message:
print(ERRVL(try(solve(0), silent=TRUE),
            stop("Stopped with an error: ", .)))

## End(Not run)

```

---

formula.utilities	<i>Functions for Querying, Validating and Extracting from Formulas A suite of utilities for handling model formulas of the style used in Statnet packages.</i>
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---

## Description

Functions for Querying, Validating and Extracting from Formulas

A suite of utilities for handling model formulas of the style used in Statnet packages.

## Usage

```

append_rhs.formula(object, newterms, keep.onesided = FALSE)

append_rhs.formula(object, newterms, keep.onesided = FALSE)

filter_rhs.formula(object, f, ...)

nonsimp_update.formula(object, new, ..., from.new = FALSE)

nonsimp.update.formula(object, new, ..., from.new = FALSE)

term.list.formula(rhs, sign = +1)

list_summands.call(object)

list_rhs.formula(object)

eval_lhs.formula(object)

```

## Arguments

object	formula object to be updated or evaluated
--------	---



<code>newterms</code>	list of terms (names) to append to the formula, or a formula whose RHS terms will be used; either may have a "sign" attribute vector of the same length as the list, giving the sign of each term (+1 or -1).
<code>keep.onesided</code>	if the initial formula is one-sided, keep it whether to keep it one-sided or whether to make the initial formula the new LHS
<code>f</code>	a function whose first argument is the term and whose additional arguments are forwarded from ... that returns either TRUE or FALSE, for whether that term should be kept.
<code>...</code>	Additional arguments. Currently unused.
<code>new</code>	new formula to be used in updating
<code>from.new</code>	logical or character vector of variable names. controls how environment of formula gets updated.
<code>rhs, sign</code>	Arguments to the deprecated <code>term.list.formula</code> .

## Value

`append_rhs.formula` each return an updated formula object

`nonsimp_update.formula` each return an updated formula object

`list_summands.call` returns a list of unevaluated calls, with an additional numerical vector attribute "sign" with of the same length, giving the corresponding term's sign as +1 or -1.

`list_rhs.formula` returns a list of formula terms, with an additional numerical vector attribute "sign" with of the same length, giving the corresponding term's sign as +1 or -1.

`eval_lhs.formula` an object of whatever type the LHS evaluates to.

## Functions

- `append_rhs.formula`: `append_rhs.formula` appends a list of terms to the RHS of a formula. If the formula is one-sided, the RHS becomes the LHS, if `keep.onesided==FALSE` (the default).
- `append_rhs.formula`: `append_rhs.formula` has been renamed to `append_rhs.formula`.
- `filter_rhs.formula`: `filter_rhs.formula` filters through the terms in the RHS of a formula, returning a formula without the terms for which function `f(term, ...)` is FALSE. Terms inside another term (e.g., parentheses or an operator other than + or -) will be unaffected.
- `nonsimp_update.formula`: `nonsimp_update.formula` is a reimplement of [update.formula](#) that does not simplify. Note that the resulting formula's environment is set as follows. If `from.new==FALSE`, it is set to that of object. Otherwise, a new sub-environment of object, containing, in addition, variables in `new` listed in `from.new` (if a character vector) or all of `new` (if TRUE).
- `nonsimp_update.formula`: `nonsimp_update.formula` has been renamed to `nonsimp_update.formula`.
- `term.list.formula`: `term.list.formula` is an older version of `list_rhs.formula` that required the RHS call, rather than the formula itself.
- `list_summands.call`: `list_summands.call`, given an unevaluated call or expression containing the sum of one or more terms, returns a list of the terms being summed, handling + and - operators and parentheses, and keeping track of whether a term has a plus or a minus sign.
- `list_rhs.formula`: `list_rhs.formula` returns a list containing terms in a given formula, handling + and - operators and parentheses, and keeping track of whether a term has a plus or a minus sign.
- `eval_lhs.formula`: `eval_lhs.formula` extracts the LHS of a formula, evaluates it in the formula's environment, and returns the result.

## Examples

```
## append_rhs.formula

(f1 <- append_rhs.formula(y~x,list(as.name("z1"),as.name("z2"))))
(f2 <- append_rhs.formula(~y,list(as.name("z"))))
(f3 <- append_rhs.formula(~y+x,structure(list(as.name("z")),sign=-1))
(f4 <- append_rhs.formula(~y,list(as.name("z")),TRUE))
(f5 <- append_rhs.formula(y~x,~z1~z2))

## filter_rhs.formula
(f1 <- filter_rhs.formula(~a-b+c, `!=`, "a"))
(f2 <- filter_rhs.formula(~-a+b-c, `!=`, "a"))
(f3 <- filter_rhs.formula(~a-b+c, `!=`, "b"))
(f4 <- filter_rhs.formula(~-a+b-c, `!=`, "b"))
(f5 <- filter_rhs.formula(~a-b+c, `!=`, "c"))
(f6 <- filter_rhs.formula(~-a+b-c, `!=`, "c"))
(f7 <- filter_rhs.formula(~c-a+b-c(a),
                        function(x) (if(is.call(x)) x[[1]] else x)!="c"))

## eval_lhs.formula

(result <- eval_lhs.formula((2+2)~1))

stopifnot(identical(result,4))
```

---

logspace.utils

*Utilities for performing calculations on logarithmic scale.*


---

## Description

A small suite of functions to compute sums, means, and weighted means on logarithmic scale, minimizing loss of precision.

## Usage

```
log_sum_exp(logx, use_ldouble = FALSE)

log_mean_exp(logx, use_ldouble = FALSE)

lweighted.mean(x, logw)

lweighted.var(x, logw)
```

## Arguments

logx	Numeric vector of $\log(x)$ , the natural logarithms of the values to be summed or averaged.
------	--

use_ldouble	Whether to use long double precision in the calculation. If TRUE, 's C built-in <code>logspace_sum()</code> is used. If FALSE, the package's own implementation based on it is used, using double precision, which is (on most systems) several times faster, at the cost of precision.
x	Numeric vector of $x$ , the (raw) values to be summed or averaged. For <code>lweighted.mean</code> , $x$ may also be a matrix, in which case the weighted mean will be computed for each column of $x$ .
logw	Numeric vector of $\log(w)$ , the natural logarithms of the weights.

**Value**

The functions return the equivalents of the following R expressions, but faster and with less loss of precision:

```
log_sum_exp(logx) log(sum(exp(logx)))
```

```
log_mean_exp(logx) log(mean(exp(logx)))
```

```
lweighted.mean(x, logw) sum(x*exp(logw))/sum(exp(logw)) for x scalar and colSums(x*exp(logw))/sum(exp(logw)) for x matrix
```

```
lweighted.var(x, logw) crossprod(x*exp(logw/2))/sum(exp(logw))
```

**Author(s)**

Pavel N. Krivitsky

**Examples**

```
logx <- rnorm(1000)
stopifnot(all.equal(log(sum(exp(logx))), log_sum_exp(logx)))
stopifnot(all.equal(log(mean(exp(logx))), log_mean_exp(logx)))

x <- rnorm(1000)
logw <- rnorm(1000)
stopifnot(all.equal(m <- sum(x*exp(logw))/sum(exp(logw)), lweighted.mean(x, logw)))
stopifnot(all.equal(sum((x-m)^2*exp(logw))/sum(exp(logw)),
  lweighted.var(x, logw), check.attributes=FALSE))

x <- cbind(x, rnorm(1000))
stopifnot(all.equal(m <- colSums(x*exp(logw))/sum(exp(logw)),
  lweighted.mean(x, logw), check.attributes=FALSE))
stopifnot(all.equal(crossprod(t(t(x)-m)*exp(logw/2))/sum(exp(logw)),
  lweighted.var(x, logw), check.attributes=FALSE))
```

---

mcmc-utilities

*Utility operations for `mcmc.list` objects*


---

**Description**

`colMeans.mcmc.list` is a "method" for (non-generic) `colMeans` applicable to `mcmc.list` objects.

`sweep.mcmc.list` is a "method" for (non-generic) `sweep` applicable to `mcmc.list` objects.

`lapply.mcmc.list` is a "method" for (non-generic) `lapply` applicable to `mcmc.list` objects.

## Usage

```
colMeans.mcmc.list(x, ...)  
  
sweep.mcmc.list(x, STATS, FUN = "-", check.margin = TRUE, ...)  
  
lapply.mcmc.list(X, FUN, ...)
```

## Arguments

`x` a `mcmc.list` object.  
`...` additional arguments to `colMeans` or `sweep`.  
`STATS, FUN, check.margin` See help for `sweep`.  
`X` An `mcmc.list` object.

## Value

`colMeans.mcmc` returns a vector with length equal to the number of mcmc chains in `x` with the mean value for each chain.

`sweep.mcmc.list` returns an appropriately modified version of `x`

`lapply.mcmc.list` returns an `mcmc.list` each of whose chains had been passed through `FUN`.

## See Also

`colMeans, mcmc.list`  
`sweep`  
`lapply`

## Examples

```
data(line, package="coda")  
summary(line) # coda  
colMeans.mcmc.list(line) # "Method"  
  
data(line, package="coda")  
colMeans.mcmc.list(line)-1:3  
colMeans.mcmc.list(sweep.mcmc.list(line, 1:3))  
  
data(line, package="coda")  
colMeans.mcmc.list(line)[c(2,3,1)]  
colMeans.mcmc.list(lapply.mcmc.list(line, `[`, c(2,3,1)))
```

---

message_print	print objects to the message output.
---------------	--------------------------------------

---

### Description

A thin wrapper around `print` that captures its output and prints it as a `message`, usually to `STDERR`.

### Usage

```
message_print(..., messageArgs = NULL)
```

### Arguments

...	arguments to <code>print</code> .
messageArgs	a list of arguments to be passed directly to <code>message</code> .

### Examples

```
cat(1:5)

print(1:5)
message_print(1:5) # Looks the same (though may be in a different color on some frontends).

suppressMessages(print(1:5)) # Still prints
suppressMessages(message_print(1:5)) # Silenced
```

---

NVL	Convenience functions for handling <code>NULL</code> objects.
-----	---

---

### Description

Convenience functions for handling `NULL` objects.

### Usage

```
NVL(...)

NVL2(test, notnull, null = NULL)

NVL3(test, notnull, null = NULL)

NVL(x) <- value
```

### Arguments

..., test	expressions to be tested.
notnull	expression to be returned if test is not <code>NULL</code> .
null	expression to be returned if test is <code>NULL</code> .
x	an object to be overwritten if <code>NULL</code> .
value	new value for x.

## Functions

- **NVL**: Inspired by SQL function NVL, returns the first argument that is not NULL, or NULL if all arguments are NULL.
- **NVL2**: Inspired by Oracle SQL function NVL2, returns the second argument if the first argument is not NULL and the third argument if the first argument is NULL. The third argument defaults to NULL, so `NVL2(a, b)` can serve as shorthand for `(if(!is.null(a)) b)`.
- **NVL3**: Inspired by Oracle SQL NVL2 function and `magrittr %>%` operator, behaves as NVL2 but `.s` in the second argument are substituted with the first argument.
- **NVL<-**: Assigning to NVL overwrites its first argument if that argument is **NULL**. Note that it will *always* return the right-hand-side of the assignment (value), regardless of what `x` is.

## Note

Whenever possible, these functions use lazy evaluation, so, for example `NVL(1, stop("Error!"))` will never evaluate the `stop` call and will not produce an error, whereas `NVL(NULL, stop("Error!"))` would.

## See Also

`NULL`, `is.null`, `if`

## Examples

```
a <- NULL

a # NULL
NVL(a,0) # 0

b <- 1

b # 1
NVL(b,0) # 1

# Here, object x does not exist, but since b is not NULL, x is
# never evaluated, so the statement finishes.
NVL(b,x) # 1

# Also,
NVL(NULL,1,0) # 1
NVL(NULL,0,1) # 0
NVL(NULL,NULL,0) # 0
NVL(NULL,NULL,NULL) # NULL

NVL2(a, "not null!", "null!") # "null!"
NVL2(b, "not null!", "null!") # "not null!"

NVL3(a, "not null!", "null!") # "null!"
NVL3(b, .+1, "null!") # 2

NVL(a) <- 2
a # 2
NVL(b) <- 2
b # still 1
```

---

opttest	<i>Optionally test code depending on environment variable.</i>
---------	--

---

## Description

A convenience wrapper to run code based on whether an environment variable is defined.

## Usage

```
opttest(expr, testname = NULL, testvar = "ENABLE_statnet_TESTS",
        yesvals = c("y", "yes", "t", "true", "1"), lowercase = TRUE)
```

## Arguments

expr	An expression to be evaluated only if testvar is set to a non-empty value.
testname	Optional name of the test. If given, and the test is skipped, will print a message to that end, including the name of the test, and instructions on how to enable it.
testvar	Environment variable name. If set to one of the yesvals, expr is run. Otherwise, an optional message is printed.
yesvals	A character vector of strings considered affirmative values for testvar.
lowercase	Whether to convert the value of testvar to lower case before comparing it to yesvals.

---

order	<i>Implement the <a href="#">sort</a> and <a href="#">order</a> methods for <a href="#">data.frame</a> and <a href="#">matrix</a>, sorting it in lexicographic order.</i>
-------	---

---

## Description

These function return a data frame sorted in lexicographic order or a permutation that will rearrange it into lexicographic order: first by the first column, ties broken by the second, remaining ties by the third, etc..

## Usage

```
order(..., na.last = TRUE, decreasing = FALSE)

## Default S3 method:
order(..., na.last = TRUE, decreasing = FALSE)

## S3 method for class 'data.frame'
order(..., na.last = TRUE, decreasing = FALSE)

## S3 method for class 'matrix'
order(..., na.last = TRUE, decreasing = FALSE)

## S3 method for class 'data.frame'
sort(x, decreasing = FALSE, ...)
```

**Arguments**

...	Ignored for sort. For order, first argument is the data frame to be ordered. (This is needed for compatibility with <a href="#">order</a> .)
na.last	See <a href="#">order</a> documentation.
decreasing	Whether to sort in decreasing order.
x	A <a href="#">data.frame</a> to sort.

**Value**

For sort, a data frame, sorted lexicographically. For order, a permutation I (of a vector `1:nrow(x)`) such that `x[I,,drop=FALSE]` equals x ordered lexicographically.

**See Also**

[data.frame](#), [sort](#), [order](#), [matrix](#)

**Examples**

```
data(iris)
head(iris)
head(order(iris))
head(sort(iris))
stopifnot(identical(sort(iris),iris[order(iris),]))
```

---

paste.and	<i>Concatenates the elements of a vector (optionally enclosing them in quotation marks or parentheses) adding appropriate punctuation and conjunctions.</i>
-----------	---

---

**Description**

A vector x becomes "x[1]", "x[1] and x[2]", or "x[1], x[2], and x[3]", depending on the length of x.

**Usage**

```
paste.and(x, oq = "", cq = "", con = "and")
```

**Arguments**

x	A vector.
oq	Opening quotation symbol. (Defaults to none.)
cq	Closing quotation symbol. (Defaults to none.)
con	Conjunction to be used if <code>length(x)&gt;1</code> . (Defaults to "and".)



**Value**

A string with the output.

**See Also**

paste, cat

**Examples**

```
print(paste.and(c()))  
print(paste.and(1))  
print(paste.and(1:2))  
print(paste.and(1:3))  
print(paste.and(1:4, con='or'))
```

---

print.control.list	<i>Pretty print the control list</i>
--------------------	--------------------------------------

---

**Description**

This function prints the control list, including what it can control and the elements.

**Usage**

```
## S3 method for class 'control.list'  
print(x, ...)
```

**Arguments**

x	A list generated by a control.* function.
...	Unused at this time.

**See Also**

[check.control.class](#), [set.control.class](#)

---

`rle.utils`*RLE utilities*

---

**Description**

Simple utilities for operations on RLE-encoded vectors.

**Usage**

```
## S3 method for class 'rle'
c(...)

## S3 method for class 'rle'
!x

binop.rle(e1, e2, FUN)

## S3 method for class 'rle'
e1 | e2

## S3 method for class 'rle'
e1 & e2

compact.rle(x)

## S3 method for class 'rle'
any(..., na.rm = FALSE)

## S3 method for class 'rle'
all(..., na.rm = FALSE)

## S3 method for class 'rle'
e1 * e2

## S3 method for class 'rle'
e1 / e2

## S3 method for class 'rle'
e1 - e2

## S3 method for class 'rle'
e1 + e2

## S3 method for class 'rle'
e1 ^ e2

## S3 method for class 'rle'
e1 %% e2

## S3 method for class 'rle'
e1 %/% e2
```

```

## S3 method for class 'rle'
e1 == e2

## S3 method for class 'rle'
e1 > e2

## S3 method for class 'rle'
e1 < e2

## S3 method for class 'rle'
e1 != e2

## S3 method for class 'rle'
e1 <= e2

## S3 method for class 'rle'
e1 >= e2

## S3 method for class 'rle'
sum(..., na.rm = FALSE)

## S3 method for class 'rle'
mean(x, na.rm = FALSE, ...)

## S3 method for class 'rle'
length(x)

## S3 method for class 'rle'
is.na(x)

## S3 method for class 'rle'
rep(x, ..., scale = c("element", "run"), doNotCompact = FALSE)

```

## Arguments

...	For c, objects to be concatenated. The first object must be of class <a href="#">rle</a> . For rep, see documentation for <a href="#">rep</a> . For sum, objects to be summed.
x, e1, e2	Arguments to unary (x) and binary (e1 and e2) operators.
FUN	A binary function or operator or a name of one. It is assumed to be vectorized: it expects two vectors of equal lengths and outputs a vector of the same length.
na.rm	see documentation for <a href="#">any</a> , <a href="#">all</a> , and <a href="#">sum</a> .
scale	whether to replicate the elements of the RLE-compressed vector or the runs.
doNotCompact	whether the method should call <a href="#">compact.rle</a> the results before returning. Methods liable to produce very long output vectors, like <a href="#">rep</a> , have this set FALSE by default.

## Value

Unless otherwise stated, all functions return an [rle](#) object. By default, the functions and the operators do not merge adjacent runs with the same value. This must be done explicitly with [compact.rle](#).

`any`, `all`, `sum`, and `length` return logical, logical, numeric, and numeric vectors, respectively.

## Functions

- `binop.rle`: Perform an arbitrary binary operation on the pair of vectors represented by the `rle` objects.
- `compact.rle`: Compact the `rle` object by merging adjacent runs.

## Note

Since `rle` stores run lengths as integers, `compact.rle` will not merge runs that add up to lengths greater than what can be represented by a 32-bit signed integer (2147483647).

The `length` method returns the length of the vector represented by the object, obtained by summing the lengths of individual runs.

The `rep` method for `rle` objects is very limited at this time. Even though the default setting is to replicate elements of the vector, only the run-replicating functionality is implemented at this time except for the simplest case (scalar times argument).

## Examples

```
x <- rle(as.logical(rbinom(10,1,.7)))
y <- rle(as.logical(rbinom(10,1,.3)))

stopifnot(isTRUE(all.equal(c(inverse.rle(x),inverse.rle(y)),inverse.rle(c(x,y)))))

stopifnot(isTRUE(all.equal(!inverse.rle(x),inverse.rle(!x))))
stopifnot(isTRUE(all.equal((inverse.rle(x)|inverse.rle(y)),inverse.rle(x|y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)&inverse.rle(y)),inverse.rle(x&y))))
stopifnot(identical(rle(inverse.rle(x)&inverse.rle(y)),compact.rle(x&y)))

big <- structure(list(lengths=as.integer(rep(.Machine$integer.max/4,6)),
                      values=rep(TRUE,6)), class="rle")

stopifnot(all(aggregate(as.numeric(lengths)~values,
                        data=as.data.frame(unclass(big)),FUN=sum)
              ==
              aggregate(as.numeric(lengths)~values,
                        data=as.data.frame(unclass(compact.rle(big))),
                        FUN=sum)))

x <- rle(as.logical(rbinom(10,1,.9)))
y <- rle(as.logical(rbinom(10,1,.1)))

stopifnot(isTRUE(all.equal(any(x),any(inverse.rle(x)))))
stopifnot(isTRUE(all.equal(any(y),any(inverse.rle(y)))))

stopifnot(isTRUE(all.equal(all(x),all(inverse.rle(x)))))
stopifnot(isTRUE(all.equal(all(y),all(inverse.rle(y)))))

x <- rle(sample(c(-1,+1), 10, c(.7,.3), replace=TRUE))
y <- rle(sample(c(-1,+1), 10, c(.3,.7), replace=TRUE))
```

```

stopifnot(isTRUE(all.equal((inverse.rle(x)*inverse.rle(y)),inverse.rle(x*y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)/inverse.rle(y)),inverse.rle(x/y))))
stopifnot(isTRUE(all.equal((-inverse.rle(y)),inverse.rle(-y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)-inverse.rle(y)),inverse.rle(x-y))))
stopifnot(isTRUE(all.equal((+inverse.rle(y)),inverse.rle(+y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)+inverse.rle(y)),inverse.rle(x+y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)^inverse.rle(y)),inverse.rle(x^y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)%inverse.rle(y)),inverse.rle(x%y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)%%inverse.rle(y)),inverse.rle(x%%y))))
stopifnot(isTRUE(all.equal(inverse.rle(x)==inverse.rle(y),inverse.rle(x==y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)>inverse.rle(y)),inverse.rle(x>y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)<inverse.rle(y)),inverse.rle(x<y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)!=inverse.rle(y)),inverse.rle(x!=y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)<=inverse.rle(y)),inverse.rle(x<=y))))
stopifnot(isTRUE(all.equal((inverse.rle(x)>=inverse.rle(y)),inverse.rle(x>=y))))

stopifnot(isTRUE(all.equal(sum(inverse.rle(x)),sum(x))))
stopifnot(isTRUE(all.equal(sum(inverse.rle(y)),sum(y))))

stopifnot(isTRUE(all.equal(mean(inverse.rle(x)),mean(x))))
stopifnot(isTRUE(all.equal(mean(inverse.rle(y)),mean(y))))

stopifnot(isTRUE(all.equal(length(inverse.rle(x)),length(x))))
stopifnot(isTRUE(all.equal(length(inverse.rle(y)),length(y))))

x$values[1] <- NA
y$values[1] <- NA
stopifnot(isTRUE(all.equal(is.na(inverse.rle(x)),inverse.rle(is.na(x)))))
stopifnot(isTRUE(all.equal(is.na(inverse.rle(y)),inverse.rle(is.na(y)))))

x <- rle(sample(c(-1,+1), 10, c(.7,.3), replace=TRUE))
y <- rpois(length(x$lengths), 2)

stopifnot(isTRUE(all.equal(rep(inverse.rle(x), rep(y, x$lengths)),
                              inverse.rle(rep(x, y, scale="run")))))

stopifnot(isTRUE(all.equal(rep(inverse.rle(x), max(y)),
                              inverse.rle(rep(x, max(y), scale="element")))))

```

---

set.control.class	<i>Set the class of the control list</i>
-------------------	--

---

## Description

This function sets the class of the control list, with the default being the name of the calling function.

## Usage

```

set.control.class(myname = {      sc <- sys.calls()
  as.character(sc[[length(sc) - 1]][[1]]) }, control = get("control", pos =
  parent.frame()))

```

**Arguments**

<code>myname</code>	Name of the class to set.
<code>control</code>	Control list. Defaults to the <code>control</code> variable in the calling function.

**Value**

The control list with class set.

**Note**

In earlier versions, `OKnames` and `myname` were autodetected. This capability has been deprecated and results in a warning issued once per session. They now need to be set explicitly.

**See Also**

`check.control.class`, `print.control.list`

---

`statnet.cite`

CITATION file utilities for Statnet packages (*DEPRECATED*)

---

**Description**

These functions automate citation generation for Statnet Project packages. They no longer appear to work with CRAN and are thus deprecated.

**Usage**

```
statnet.cite.head(pkg)
```

```
statnet.cite.footer(pkg)
```

```
statnet.cite.pkg(pkg)
```

**Arguments**

<code>pkg</code>	Name of the package whose citation is being generated.
------------------	--

**Value**

For `statnet.cite.head` and `statnet.cite.footer`, an object of type `citationHeader` and `citationFooter`, respectively, understood by the `citation` function, with package name substituted into the template.

For `statnet.cite.pkg`, an object of class `bibentry` containing a 'software manual' citation for the package constructed from the current version and author information in the `DESCRIPTION` and a template.

**See Also**

`citation`, `citHeader`, `citFooter`, `bibentry`

## Examples

```
## Not run:
statnet.cite.head("statnet.common")

statnet.cite.pkg("statnet.common")

statnet.cite.foot("statnet.common")

## End(Not run)
```

---

statnetStartupMessage	<i>Construct a "standard" startup message to be printed when the package is loaded.</i>
-----------------------	---

---

## Description

This function uses information returned by [packageDescription](#) to construct a standard package startup message according to the policy of the Statnet Project. To determine institutional affiliation, it uses a lookup table that maps domain names to institutions. (E.g., \*.uw.edu or \*.washington.edu maps to University of Washington.)

## Usage

```
statnetStartupMessage(pkgname, friends, nofriends)
```

## Arguments

pkgname	Name of the package whose information is used.
friends	<p>This argument is required, but will only be interpreted if the Statnet Project policy makes use of "friendly" package information.</p> <p>A character vector of names of packages whose attribution information incorporates the attribution information of this package, or TRUE. (This may, in the future, lead the package to suppress its own startup message when loaded by a "friendly" package.)</p> <p>If TRUE, the package considers all other packages "friendly". (This may, in the future, lead the package to suppress its own startup message when loaded by another package, but print it when loaded directly by the user.)</p>
nofriends	<p>This argument controls the startup message if the Statnet Project policy does not make use of "friendly" package information but does make use of whether or not the package is being loaded directly or as a dependency.</p> <p>If TRUE, the package is willing to suppress its startup message if loaded as a dependency. If FALSE, it is not.</p>

## Value

A string containing the startup message, to be passed to the [packageStartupMessage](#) call or NULL, if policy prescribes printing 's default startup message. (Thus, if statnetStartupMessage returns NULL, the calling package should not call [packageStartupMessage](#) at all.)

Note that arguments to friends and nofriends are merely requests, to be interpreted (or ignored) by the statnetStartupMessage according to the Statnet Project policy.

**See Also**

packageDescription

**Examples**

```
## Not run:
.onAttach <- function(lib, pkg){
  sm <- statnetStartupMessage("ergm", friends=c("statnet","ergm.count","tergm"), nofriends=FALSE)
  if(!is.null(sm)) packageStartupMessage(sm)
}

## End(Not run)
```

---

sweep_cols.matrix	<i>Subtract a elements of a vector from respective columns of a matrix</i>
-------------------	--

---

**Description**

An optimized function equivalent to `sweep(x, 2, STATS)` for a matrix `x`.

**Usage**

```
sweep_cols.matrix(x, STATS, disable_checks = FALSE)
```

**Arguments**

<code>x</code>	a numeric matrix;
<code>STATS</code>	a numeric vector whose length equals to the number of columns of <code>x</code> .
<code>disable_checks</code>	if TRUE, do not check that <code>x</code> is a numeric matrix and its number of columns matches the length of <code>STATS</code> ; set in production code for a significant speed-up.

**Value**

A matrix of the same attributes as `x`.

**Examples**

```
x <- matrix(runif(1000), ncol=4)
s <- 1:4

stopifnot(all.equal(sweep_cols.matrix(x, s), sweep(x, 2, s)))
```



---

unwhich	<i>Construct a logical vector with TRUE in specified positions.</i>
---------	---

---

### Description

This function is basically an inverse of [which](#).

### Usage

```
unwhich(which, n)
```

### Arguments

which	a numeric vector of indices to set to TRUE.
n	total length of the output vector.

### Value

A logical vector of length n whose elements listed in which are set to TRUE, and all other elements set to FALSE.

### Examples

```
x <- as.logical(rbinom(10,1,0.5))
stopifnot(all(x == unwhich(which(x), 10)))
```

---

vector.namesmatch	<i>reorder vector v into order determined by matching the names of its elements to a vector of names</i>
-------------------	--

---

### Description

A helper function to reorder vector v (if named) into order specified by matching its names to the argument names

### Usage

```
vector.namesmatch(v, names, errname = NULL)
```

### Arguments

v	a vector (or list) with named elements, to be reordered
names	a character vector of element names, corresponding to names of v, specifying desired ordering of v
errname	optional, name to be reported in any error messages. default to deparse(substitute(v))

**Details**

does some checking of appropriateness of arguments, and reorders `v` by matching its names to character vector names

**Value**

returns `v`, with elements reordered

**Note**

earlier versions of this function did not order as advertised

**Examples**

```
test<-list(c=1,b=2,a=3)
vector.namesmatch(test,names=c('a','c','b'))
```

---

wmatrix

*A data matrix with row weights*

---

**Description**

A representation of a numeric matrix with row weights, represented on either linear (`linwmatrix`) or logarithmic (`logwmatrix`) scale.

**Usage**

```
logwmatrix(data = NA, nrow = 1, ncol = 1, byrow = FALSE,
  dimnames = NULL, w = NULL)
```

```
linwmatrix(data = NA, nrow = 1, ncol = 1, byrow = FALSE,
  dimnames = NULL, w = NULL)
```

```
is.wmatrix(x)
```

```
is.logwmatrix(x)
```

```
is.linwmatrix(x)
```

```
as.linwmatrix(x, ...)
```

```
as.logwmatrix(x, ...)
```

```
## S3 method for class 'linwmatrix'
as.linwmatrix(x, ...)
```

```
## S3 method for class 'logwmatrix'
as.linwmatrix(x, ...)
```

```
## S3 method for class 'logwmatrix'
```

```

as.logwmatrix(x, ...)

## S3 method for class 'linwmatrix'
as.logwmatrix(x, ...)

## S3 method for class 'matrix'
as.linwmatrix(x, w = NULL, ...)

## S3 method for class 'matrix'
as.logwmatrix(x, w = NULL, ...)

## S3 method for class 'wmatrix'
print(x, ...)

## S3 method for class 'logwmatrix'
print(x, ...)

## S3 method for class 'linwmatrix'
print(x, ...)

## S3 method for class 'logwmatrix'
compress_rows(x, ...)

## S3 method for class 'linwmatrix'
compress_rows(x, ...)

## S3 method for class 'wmatrix'
decompress_rows(x, target.nrows = NULL, ...)

## S3 method for class 'wmatrix'
x[i, j, ..., drop = FALSE]

## S3 replacement method for class 'wmatrix'
x[i, j, ...] <- value

```

### Arguments

data, nrow, ncol, byrow, dimnames	passed to <a href="#">matrix</a> .
w	row weights on the appropriate scale.
x	an object to be coerced or tested.
...	extra arguments, currently unused.
target.nrows	see <a href="#">decompress_rows</a> .
i, j, value	rows and columns and values for extraction or replacement; as <a href="#">matrix</a> .
drop	Used for consistency with the generic. Ignored, and always treated as FALSE.

### Value

An object of class `linwmatrix`/`logwmatrix` and `wmatrix`, which is a [matrix](#) but also has an attribute `w` containing row weights on the linear or the natural-log-transformed scale.

**Note**

Note that wmatrix itself is an "abstract" class: you cannot instantiate it.

Note that at this time, wmatrix is designed as, first and foremost, as class for storing compressed data matrices, so most methods that operate on matrices may not handle the weights correctly and may even cause them to be lost.

**See Also**

[rowweights](#), [lrowweights](#), [compress\\_rows](#)

**Examples**

```
(m <- matrix(1:3, 2, 3, byrow=TRUE))
(m <- rbind(m, 3*m, 2*m, m))
(mlog <- as.logwmatrix(m))
(mlin <- as.linwmatrix(m))
(cmlog <- compress_rows(mlog))
(cmlin <- compress_rows(mlin))

stopifnot(all.equal(as.linwmatrix(cmlog),cmlin))

cmlog[2,] <- 1:3
(cmlog <- compress_rows(cmlog))
stopifnot(sum(rowweights(cmlog))==nrow(m))

(m3 <- matrix(c(1:3,(1:3)*2,(1:3)*3), 3, 3, byrow=TRUE))
(rowweights(m3) <- c(4, 2, 2))

stopifnot(all.equal(compress_rows(as.logwmatrix(m)), as.logwmatrix(m3),check.attributes=FALSE))
stopifnot(all.equal(rowweights(compress_rows(as.logwmatrix(m))),
                      rowweights(as.logwmatrix(m3)),check.attributes=FALSE))
```

---

wmatrix\_weights

---

Set or extract weighted matrix row weights

---

**Description**

Set or extract weighted matrix row weights

**Usage**

```
rowweights(x, ...)

## S3 method for class 'linwmatrix'
rowweights(x, ...)

## S3 method for class 'logwmatrix'
rowweights(x, ...)

lrowweights(x, ...)

## S3 method for class 'logwmatrix'
```

```

lrowweights(x, ...)

## S3 method for class 'linwmatrix'
lrowweights(x, ...)

rowweights(x, ...) <- value

## S3 replacement method for class 'linwmatrix'
rowweights(x, update = TRUE, ...) <- value

## S3 replacement method for class 'logwmatrix'
rowweights(x, update = TRUE, ...) <- value

lrowweights(x, ...) <- value

## S3 replacement method for class 'linwmatrix'
lrowweights(x, update = TRUE, ...) <- value

## S3 replacement method for class 'logwmatrix'
lrowweights(x, update = TRUE, ...) <- value

## S3 replacement method for class 'matrix'
rowweights(x, ...) <- value

## S3 replacement method for class 'matrix'
lrowweights(x, ...) <- value

```

### Arguments

x	a <a href="#">linwmatrix</a> , a <a href="#">logwmatrix</a> , or a <a href="#">matrix</a> ; a <a href="#">matrix</a> is coerced to a weighted matrix of an appropriate type.
...	extra arguments for methods.
value	weights to set, on the appropriate scale.
update	if TRUE (the default), the old weights are updated with the new weights (i.e., corresponding weights are multiplied on linear scale or added on on log scale); otherwise, they are overwritten.

### Value

For the accessor functions, the row weights or the row log-weights; otherwise, a weighted matrix with modified weights. The type of weight (linear or logarithmic) is converted to the required type and the type of weighting of the matrix is preserved.

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