Package 'narray'

October 13, 2022

Title Subset- And Name-Aware Array Utility Functions

Version 0.5.1

Author Michael Schubert <mschu.dev@gmail.com>

Maintainer Michael Schubert <mschu.dev@gmail.com>

Description Stacking arrays according to dimension names, subset-aware splitting and mapping of functions, intersecting along arbitrary dimensions, converting to and from data.frames, and many other helper functions.

URL https://github.com/mschubert/narray

BugReports https://github.com/mschubert/narray/issues

Depends R (>= 3.0.2)

LinkingTo Rcpp

SystemRequirements C++11

Imports progress, Rcpp, stats, stringr, utils

License Apache License (== 2.0) | file LICENSE

Encoding UTF-8

Suggests knitr, rmarkdown, testthat

VignetteBuilder knitr

RoxygenNote 7.2.1

NeedsCompilation yes

Repository CRAN

Date/Publication 2022-10-02 13:40:02 UTC

R topics documented:

`bind` *Binds arrays together disregarding names*

Description

Binds arrays together disregarding names

Usage

```
bind(..., along = length(dim(arrayList[[1]])) + 1)
```

Arguments

`...`	N-dimensional arrays, or a list thereof
`along`	Along which axis to bind them together (default: new axis)

Value

A joined array

collect *Converts a logical matrix to a list of character vectors*

Description

This currently only supports x with only one non-zero element

Usage

```
collect(x, along = 2)
```

Arguments

x	A logical matrix
along	Which axis to spread mask on

Value

A character vector or list thereof

construct *Transform a data.frame with axes and value into an array*

Description

The construct() function can be called either with the data.frame as the first argument or the formula and then specify 'data=<data.frame>'

Usage

```
construct(data, formula = guess_structure(data), fill = NA,
  name_axes = TRUE)
```

Arguments

data	A data frame
formula	A formula: value ~ axis1 [+ axis2 + axis n ..]
fill	Value to fill array with if undefined
name_axes	Keep column names of 'data' as axis names

Value

A structured array

dim *base::dim, but returning 1 for vector*

Description

base::dim, but returning 1 for vector

Usage

```
dim(x)
```

Arguments

x	Object to get dimensions on

dimnames *Return dimension names of an array respecting the number of dimensions*

Description

Act on each element if 'x' is a list

Usage

```
dimnames(x, along = TRUE, null_as_integer = FALSE,
  drop = !identical(along, TRUE))
```

Arguments

x	An n-dimensional array
along	Limit to dimension (default: all)
null_as_integer	Whether nameless dimensions should be NULL or numbered
drop	Drop list of only one axis requested (default: if not returning all dimensions)

Value

A list of dimension names with length `length(ndim(X))`

drop_if *Drop unused dims if flag is TRUE*

Description

Drop unused dims if flag is TRUE

Usage

```
drop_if(x, flag)
```

Arguments

x	An array object
flag	Whether to drop unused dimensions

Value

The object in full or with dropped dimensions

filter *Function to discard subsets of an array (NA or drop)*

Description

Function to discard subsets of an array (NA or drop)

Usage

```
filter(X, along, FUN, subsets = base::rep(1, dim(X)[along]),
  na.rm = FALSE)
```

Arguments

X	An n-dimensional array
along	Along which axis to apply FUN
FUN	Function to apply, needs to return TRUE (keep) or FALSE
subsets	Subsets that should be used when applying FUN
na.rm	Whether to omit columns and rows with NAs

Value

An array where filtered values are NA or dropped

flatten *Flattens an array along an axis*

Description

Flattens an array along an axis

Usage

```
flatten(x, along = -1, name_sep = NA)
```

Arguments

x	Array
along	Along which axis to bind them together (default: last)
name_sep	Which character to use for naming new arrays [default: NA, do not touch names]

Value

An array with n-1 dimensions

guess_structure *Infer array structure from data.frame*

Description

Infer array structure from data.frame

Usage

```
guess_structure(df, verbose = TRUE)
```

Arguments

df	A data.frame with ordered axes, value field last
verbose	Print message with inferred structure (default: TRUE)

Value

A formula describing this structure

intersect — *Intersects all passed arrays along a give dimension, and modifies them in place*

Description

TODO: accept along=c(1,2,1,1...) [maybe list w/ vectors as well?] TODO: accept data=env/list arg? [sig-comb/drug-tissue/assocs.r#62-65]

Usage

```
intersect(..., along = 1, envir = parent.frame(), drop = FALSE,
  fail_if_empty = TRUE)
```

Arguments

...	Arrays that should be intersected
along	The axis along which to intersect
envir	A list or environment to act upon
drop	Drop unused dimensions on result
fail_if_empty	Stop if intersection yields empty set

intersect_list — *Intersects a lits of arrays for common dimension names*

Description

Intersects a lits of arrays for common dimension names

Usage

```
intersect_list(l., along = 1, drop = FALSE, fail_if_empty = TRUE)
```

Arguments

l.	List of arrays to perform operations on
along	The axis along which to intersect
drop	Drop unused dimensions on result
fail_if_empty	Stop if intersection yields empty set

lambda *Lambda syntax for array iteration*

Description

Lambda syntax for array iteration

Usage

```
lambda(fml, along, group = c(), simplify = TRUE, expand_grid = TRUE,
  envir = parent.frame())
```

Arguments

fml	A call prefixed with a tilde
along	A named vector which objects to subset (eg: c(x=1))
group	Not implemented
simplify	Return array instead of index+result if scalar
expand_grid	Use all combinations of indices (default: TRUE)
envir	Environment where variables can be found

like *Reshapes* x *to be like* like*, including dimension names*

Description

Reshapes x to be like like, including dimension names

Usage

```
like(x, like)
```

Arguments

x	An n-dimensional array
like	An n-dimensional array whose form X should inherit

Value

An array with values of X and structure of like

map — *Maps a function along an array preserving its structure*

Description

Maps a function along an array preserving its structure

Usage

```
map(X, along, FUN, subsets = base::rep(1, dim(X)[along]), drop = TRUE,
  ...)
```

Arguments

X	An n-dimensional array
along	Along which axis to apply the function
FUN	A function that maps a vector to the same length or a scalar
subsets	Whether to apply FUN along the whole axis or subsets thereof
drop	Remove unused dimensions after mapping; default: TRUE
...	Other arguments passed to FUN

Value

An array where FUN has been applied

map_one — *Apply function that preserves order of dimensions*

Description

Apply function that preserves order of dimensions

Usage

```
map_one(X, along, FUN, pb, drop = TRUE, ...)
```

Arguments

X	An n-dimensional array
along	Along which axis to apply the function
FUN	A function that maps a vector to the same length or a scalar
pb	progress bar object
drop	Remove unused dimensions after mapping; default: TRUE
...	Arguments passed to the function

Value

An array where FUN has been applied

---

mask *Converts a list of character vectors to a logical matrix*

Description

Converts a list of character vectors to a logical matrix

Usage

```
mask(x, along = 2, na_rm = FALSE)
```

Arguments

x	A list of character vectors
along	Which axis to spread mask on
na_rm	Remove values that were translated to NAs

Value

A logical occurrence matrix

---

match *match() function with extended functionality*

Description

match() function with extended functionality

Usage

```
match(x, from, to, filter_from = NULL, filter_to = NULL,
  data = parent.frame(), fuzzy_level = 0, table = FALSE,
  na_rm = FALSE, warn = !table && fuzzy_level > 0)
```

Arguments

x	Vector of identifiers that should be mapped
from	Vector of identifiers that can be mapped
to	Matched mapping for all identifiers
filter_from	Restrict matching to a subset from ‘from‘
filter_to	Restrict matching to a subset from ‘to‘
data	List containing the data ‘from‘ and ‘to‘ reference
fuzzy_level	0 for exact, 1 punctuation, and 2 closest character
table	Return a matching table instead of just the matches
na_rm	Flag to remove items that can not be mapped
warn	Display warning for all fuzzy matches

Value

Mapped values

---

melt *Function to melt data.frame from one or multiple arrays*

Description

Function to melt data.frame from one or multiple arrays

Usage

```
melt(..., dimnames = NULL, na_rm = TRUE)
```

Arguments

...	Array[s] or data.frame[s] to be melted
dimnames	List of names along the dimensions
na_rm	Remove rows with NAs

Value

data.frame with ’value’ (or object names if multiple) indexed by axes

named_dots *Return a list of named dot-arguments*

Description

Return a list of named dot-arguments

Usage

```
named_dots(...)
```

Arguments

...	Function arguments

Value

Named function arguments

narray *R package for subset- and name-aware array utility functions*

Description

Stacking arrays according to dimension names, subset-aware splitting and mapping of functions, intersecting along arbitrary dimensions, converting to and from data.frames, and many other helper functions.

pb *Progress bar format to be consistent*

Description

Progress bar format to be consistent

Usage

```
pb(ticks)
```

Arguments

ticks	Number of ticks the bar has

Value

A progress bar object

rep *Repeats an array along an arbitrary axis*

Description

Repeats an array along an arbitrary axis

Usage

```
rep(x, n, along = 1)

crep(x, n)

rrep(x, n)
```

Arguments

x	An array object
n	Integer, how often to repeat
along	Along which axis to repeat (default: 1)

Value

An array that is repeated ‘n‘ times on axis ‘along‘

restore_null_dimnames *If no dimnames, return NULL and not list of NULLs*

Description

If no dimnames, return NULL and not list of NULLs

Usage

```
restore_null_dimnames(x)
```

Arguments

x	An array object

Value

The object with NULL if no dimnames

split *Splits and array along a given axis, either totally or only subsets*

Description

Splits and array along a given axis, either totally or only subsets

Usage

```
split(X, along, subsets = c(1:dim(X)[along]), drop = NULL)
```

Arguments

X	An array that should be split
along	Along which axis to split; use -1 for highest dimension
subsets	Whether to split each element or keep some together
drop	Remove unused dimensions after mapping default: drop if all resulting arrays have same number of dimensions

Value

A list of arrays that combined make up the input array

stack *Stacks arrays while respecting names in each dimension*

Description

Stacks arrays while respecting names in each dimension

Usage

```
stack(..., along = length(dim(arrayList[[1]])) + 1, fill = NA,
  drop = FALSE, keep_empty = FALSE, allow_overwrite = FALSE,
  fail_if_empty = TRUE)
```

Arguments

...	N-dimensional arrays, or a list thereof
along	Which axis arrays should be stacked on (default: new axis)
fill	Value for unknown values (default: NA)
drop	Drop unused dimensions (default: FALSE)
keep_empty	Keep empty elements when stacking (default: FALSE)
allow_overwrite	Overwrite values if more arrays share same key
fail_if_empty	Stop if no arrays left after removing empty elements

Value

A stacked array, either n or n+1 dimensional

---

subset *Subsets an array using a list with indices or names*

Description

Subsets an array using a list with indices or names

Usage

```
subset(X, index, along = -1, drop = FALSE)
```

Arguments

X	The array to subset
index	A list of vectors to use for subsetting, or vector if along is given
along	Along which dimension to subset if index is a vector; default is last dimension; argument is ignored if X is a vector
drop	Remove unused dimensions after mapping; default: TRUE

Value

The subset of the array

---

translate *Translate an axis between two sets of identifiers*

Description

Translate an axis between two sets of identifiers

Usage

```
translate(x, along = 1, to, from = dimnames(x)[[along]], ..., FUN,
  na_rm = FALSE)
```

Arguments

x	A matrix
along	Along which axis to summarize
to	Names that this dimension should be summarized to
from	Names that match the dimension ‘along‘
...	Parameters passed to ‘match‘
FUN	Which function to apply, default is throwing error on aggregation
na_rm	Remove values that were translated to NAs

Value

A summarized matrix as defined by ‘from‘, ‘to‘

---

vectors_to_row_or_col *Converts vectors in a list to row- or column vectors*

Description

Converts vectors in a list to row- or column vectors

Usage

```
vectors_to_row_or_col(xlist, along)
```

Arguments

xlist	List of array-like elements and vectors
along	Along which dimension vectors should be aligned

Value

List where vectors are replaced by row- or col vectors (2d)

---

which *A multidimensional* which *function*

Description

A multidimensional which function

Usage

```
which(x, drop = TRUE)
```

Arguments

x	N-dimensional logical array
drop	Return a vector if called on a vector

Value

A matrix with indices where A == TRUE

`%or%` *Operator for array-like logical operations*

Description

Operator for array-like logical operations

Usage

```
a %or% b
```

Arguments

`a`	First vector
`b`	Second vector

Value

TRUE/FALSE for each element

Index