

Package: amc (via r-universe)

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Type Package

Title Alex's Miscellaneous Code

Description A collection of variously useful functions and utilities.

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Suggests covr, datasets, knitr, rmarkdown, rstudioapi, spelling,
testthat

BugReports <https://github.com/achubaty/amc/issues>

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Repository <https://predictiveecology.r-universe.dev>

RemoteUrl <https://github.com/achubaty/amc>

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.gc

Manual garbage collection

Description

This shouldn't be necessary, since R (usually) handles this correctly and automatically. However, sometimes when working with large geospatial data (e.g., using raster and sp packages) it can help to free recently unallocated memory manually.

Usage

`.gc()`

Author(s)

Alex Chubaty

See Also

[gc\(\)](#)

binstr *Convert integer to binary string*

Description

Convert integer to binary string

Usage

```
binstr(i, maxBits = NA)
```

Arguments

| | |
|---------|---|
| i | Positive integer $\leq 2^{53}$ ($\leq 9.007199e+15$). |
| maxBits | Maximum number of bits to print (default NA). |

Value

Character vector.

Author(s)

Alex Chubaty

Examples

```
x <- sample(0:9999, 10000)
y <- binstr(x) # length is 14 bits

## Not run:
# alternate (but slower) conversion to binary string
R.utils::intToBin(x)

## End(Not run)

# convert binary string to integer value (very fast)
strtoi(y, base = 2)
strtoi(substr(y, 1, 4), base = 2)
strtoi(substr(y, 5, 8), base = 2)
strtoi(substr(y, 9, 11), base = 2)
strtoi(substr(y, 12, 14), base = 2)

# see also `binary()` and `unbinary()` in the `composition` package (requires x11)
```

detachAllPackages *Forcibly detach all packages*

Description

Based on <https://stackoverflow.com/a/39235076/1380598>.

Usage

```
detachAllPackages()
```

Author(s)

mmfrgmpds

See Also

[detach\(\)](#), [detachPackage\(\)](#)

detachPackage *Detach and unload a package*

Description

A simple wrapper to detach using unload = TRUE.

Usage

```
detachPackage(package)
```

Arguments

package The name of a currently attached package.

Author(s)

Alex Chubaty

See Also

[detach\(\)](#), [detachAllPackages\(\)](#)

| | |
|----------|--------------------------------|
| dir.copy | <i>Copy folders with links</i> |
|----------|--------------------------------|

Description

Copies folders like `file.copy` except it replicates links correctly on unix-like systems. Based on <http://stackoverflow.com/a/30107868/1380598>.

Usage

```
dir.copy(from, to)
```

Arguments

| | |
|------|--|
| from | character indicating the path to the directory to be copied. |
| to | character indicating the path to which the directory will be copied. |

Value

Logical indicating success or failure.

Author(s)

Zach Foster
Alex Chubaty

| | |
|---------|------------------------------------|
| dl.data | <i>Intelligently download data</i> |
|---------|------------------------------------|

Description

Only downloads the specified files if it is not found locally. Optionally unzips the files.

Usage

```
dl.data(urls, dest = ".", checksum = TRUE, unzip = FALSE)
```

Arguments

| | |
|----------|--|
| urls | A character vector of data file URLs. |
| dest | The directory path in which data should be downloaded. |
| checksum | Logical indicating whether downloaded files should be checksummed. |
| unzip | Logical indicating whether the file should be unzipped after download. |

Author(s)

Alex Chubaty and Eliot McIntire

`dt2raster`*Convert data.table to a RasterLayer for plotting, etc.*

Description

Convert data.table to a RasterLayer for plotting, etc.

Usage

```
dt2raster(dt, r, val)
```

Arguments

| | |
|------------------|---|
| <code>dt</code> | data.table object with columns ID, or both X and Y, and the values to assign to the raster specified by column <code>val</code> . |
| <code>r</code> | Raster* object. |
| <code>val</code> | The name of the column in <code>dt</code> containing the values for the raster. |

Value

A RasterLayer object.

Author(s)

Alex Chubaty

Examples

```
library(data.table)
library(sp)
library(raster)

r <- raster(nrows = 10, ncols = 10)
r[] <- 10

# using x,y coordinates
#dt1 <- data.table(X = , Y = , value = r[])

# using pixel ids
dt2 <- data.table(ID = 1L:ncell(r), VALUE = r[])
dt2[, VALUE := sample(1L:10L, ncell(r), replace = TRUE)]

if (interactive())
  plot(dt2raster(dt2, r, "VALUE"))
```

| | |
|-------|--------------------------------|
| flink | <i>Create a link to a file</i> |
|-------|--------------------------------|

Description

Creates a symbolic link (symlink) to a file if possible, possibly falling back to a hard link. Hard links are for files only, and won't work across different physical drives. Symlinks won't work on Windows without admin privileges.

Usage

```
flink(from, to, symlink = TRUE)
```

Arguments

| | |
|----------|---|
| from, to | character vectors, containing file names or paths (can alternatively be the path to a single existing directory). |
| symlink | Logical indicating whether to use symlink (instead of hardlink). Default TRUE. |

Note

Use caution with files-backed objects (e.g., rasters). See examples.

Author(s)

Alex Chubaty

See Also

[file.link\(\)](#), [file.symlink\(\)](#), [Sys.readlink\(\)](#)

Examples

```
if (require("datasets", quietly = TRUE)) {
  library(raster)

  tmpDir <- file.path(tempdir(), 'symlink-test') |>
    normalizePath(winslash = '/', mustWork = FALSE)
  dir.create(tmpDir)

  f0 <- file.path(tmpDir, "file0.csv")
  write.csv(iris, f0)

  d1 <- file.path(tmpDir, "dir1")
  dir.create(d1)
  write.csv(iris, file.path(d1, "file1.csv"))

  d2 <- file.path(tmpDir, "dir2")
  f2 <- file.path(tmpDir, "file2.csv")
```

```

## create a link to the the directory; d2 should look like d1
flink(d1, d2) ## symlink
dir.exists(d2) ## TRUE
identical(d1, Sys.readlink(d2)) ## TRUE
file.exists(file.path(d2, "file1.csv")) ## TRUE

## create link to a file
flink(f0, f2) ## symlink
file.exists(f2) ## TRUE
identical(read.csv(f0), read.csv(f2)) ## TRUE

## deleting the link shouldn't delete the original file
unlink(d2, recursive = TRUE)
file.exists(file.path(d2, "file1.csv")) ## FALSE
file.exists(file.path(d1, "file1.csv")) ## TRUE

unlink(f2)
file.exists(f2) ## FALSE
file.exists(f0) ## TRUE

## using rasters and other file-backed objects
f3 <- system.file("external/test.grd", package = "raster")
r3 <- raster(f3)
f4 <- file.path(tmpDir, "raster4.grd")
flink(f3, f4, FALSE) ## hardlink the grd and gri files
flink(extension(f3, "gri"), extension(f4, "gri"), FALSE)

file.exists(f4) ## TRUE
file.exists(extension(f4, "gri")) ## TRUE
r4 <- raster(f4) ## hardlink

f5 <- file.path(tmpDir, "raster5.grd")
flink(f3, f5, TRUE) ## symlink the grd and gri files
flink(extension(f3, "gri"), extension(f5, "gri"), TRUE)
file.exists(f5) ## TRUE
file.exists(extension(f5, "gri")) ## TRUE
r5 <- raster(f5) ## symlink works
identical(r3, r5) ## TRUE

## cleanup
unlink(tmpDir, recursive = TRUE)
}

```

geometricMean

Geometric and harmonic mean

Description

Description needed.

Usage

```
geometricMean(x, ...)
```

```
harmonicMean(x, ...)
```

Arguments

x A numeric vector.
... Additional arguments to prod or mean.

Value

A numeric vector of length one.

Note

these have not been thoroughly tested to handle NA values, etc.

Author(s)

Alex Chubaty

Examples

```
series <- 1:10  
mean(series)  
geometricMean(series)  
harmonicMean(series)
```

getFileName *Get the name of a source-ed file*

Description

Use getFileName in a file that is source-ed. Based on <http://stackoverflow.com/a/1816487/1380598>.

Usage

```
getFileName(fullname)  
  
## S4 method for signature 'logical'  
getFileName(fullname)
```

Arguments

fullname Logical (default FALSE) indicating whether the full path should be returned.

Value

Character string representing the filename.

Author(s)

Alex Chubaty

get_deps

Get package dependencies (offline)

Description

Read a package's dependencies from file, rather than searching CRAN. Based on <http://stackoverflow.com/a/30225680/1380598>.

Usage

```
get_deps(path, dependencies = NA)
```

Arguments

| | |
|--------------|--|
| path | A local file path to a package directory. |
| dependencies | Logical indicating whether to also install uninstalled packages which these packages depend on/link to/import/suggest (and so on recursively). Can also be a character vector, a subset of c("Depends", "Imports", "LinkingTo", "Suggests", "Enhances"). The default, NA, means c("Depends", "Imports", "LinkingTo"). TRUE means to use c("Depends", "Imports", "LinkingTo", "Suggests"). |

Value

A character vector of package dependencies.

Author(s)

Josh O'Brien

Alex Chubaty

Examples

```
get_deps(system.file(package = "amc"))  
get_deps(system.file(package = "amc"), TRUE)
```

`guesstimate`*Guesstimate the number of CPUs for cluster operations*

Description

Take a wild stab at guessing how many CPUs to use in cluster when you have some idea of how much RAM is needed per CPU.

Usage

```
guesstimate(ram, prop = 0.8, units = "gb")
```

Arguments

| | |
|--------------------|---|
| <code>ram</code> | How much ram is required per CPU. |
| <code>prop</code> | Proportion of overall RAM to devote to R. Default 0.80. |
| <code>units</code> | Units of memory. One of either "KB", "MB", "GB". |

Details

Tries to be conservative by assuming no more than 80% system memory use.

Value

Integer. Number of CPUs to allocate to cluster.

Note

You should take these numbers with several grains of salt.

Author(s)

Alex Chubaty

Examples

```
## Not run:  
guesstimate(4)  
guesstimate(4, 0.90, "MB")  
  
## End(Not run)
```

| | |
|------|----------------------|
| hill | <i>Hill function</i> |
|------|----------------------|

Description

Hill function

Usage

```
hill(a, b, z)
```

Arguments

| | |
|---|--------------------|
| a | DESCRIPTION NEEDED |
| b | DESCRIPTION NEEDED |
| z | DESCRIPTION NEEDED |

Value

DESCRIPTION NEEDED

Author(s)

Devin Goodsman

| | |
|---------|---|
| inRange | <i>Test whether a number lies within range [a, b]</i> |
|---------|---|

Description

Default values of a=0; b=1 allow for quick test if x is a probability.

Usage

```
inRange(x, a = 0, b = 1)
```

Arguments

| | |
|---|-------------------------|
| x | values to be tested |
| a | lower bound (default 0) |
| b | upper bound (default 1) |

Value

Logical vectors. NA values in x are retained.

Author(s)

Alex Chubaty

Examples

```
set.seed(100)
x <- stats::rnorm(4) ## -0.50219235  0.13153117 -0.07891709  0.88678481
inRange(x, 0, 1)    ## FALSE  TRUE FALSE  TRUE
```

isRstudio

Check whether R is running in an Rstudio session

Description

Based on <https://stackoverflow.com/q/12389158/1380598>.

Usage

```
isRstudio()
```

loadkNNageMap

Load kNN stand age map

Description

Load kNN stand age map

Usage

```
loadkNNageMap(path, url = NULL, studyArea = NULL, ...)
```

Arguments

| | |
|-----------|---|
| path | file path where raster will be saved. |
| url | URL from which to download the data (default provided if NULL). |
| studyArea | SpatialPolygonsDataFrame giving the study area for which to extract ages. |
| ... | Additional arguments passed to Cache (only userTags currently used). |

| | |
|-------------|--|
| loadObjects | <i>Load, save, and remove .RData objects</i> |
|-------------|--|

Description

Wrapper functions to `load()`, `save()`, and `unlink()`, permitting lists of objects to be loaded/saved/deleted all at once.

Usage

```
loadObjects(  
  objects,  
  path = NULL,  
  ext = ".RData",  
  quiet = TRUE,  
  envir = parent.frame()  
)
```

```
saveObjects(  
  objects,  
  path = NULL,  
  ext = ".RData",  
  quiet = TRUE,  
  envir = parent.frame()  
)
```

```
rmObjects(objects, path = NULL, ext = ".RData", quiet = TRUE)
```

Arguments

| | |
|----------------------|---|
| <code>objects</code> | A character list or character vector of object names |
| <code>path</code> | The filepath to the directory in which to save or from which to load the objects. The path should be constructed using <code>file.path()</code> . |
| <code>ext</code> | The file extension to use (default is <code>.RData</code>). |
| <code>quiet</code> | Logical. Should output be suppressed? Default is <code>TRUE</code> . |
| <code>envir</code> | The environment in which to look for and load objects (default: the environment from which the function was called). |

Details

By default, the extension `.RData` is used.

Value

Invisibly if `quiet=TRUE`. Either a list of objects loaded, empty list if saved, or if removed either `0` for success, `1` for failure.

Author(s)

Alex Chubaty

See Also[file.path\(\)](#), [load\(\)](#), [save\(\)](#), [unlink\(\)](#)

| | |
|---------------|------------------------------------|
| loadStudyArea | <i>Load a study area from file</i> |
|---------------|------------------------------------|

Description

Simple wrapper around [sf::st_read\(\)](#) to load a kml or shapefile, and optionally reproject it.

Usage

```
loadStudyArea(path = NULL, filename = NULL, proj = NULL)
```

Arguments

| | |
|----------|--|
| path | path to directory containing the file |
| filename | the name of the file |
| proj | (optional) a crs projection string to reproject the study area to. |

Value

An sf object.

| | |
|-------|-----------------------|
| logit | <i>Logit function</i> |
|-------|-----------------------|

Description

Logit function

Usage

```
logit(p)
```

Arguments

| | |
|---|--------------------|
| p | DESCRIPTION NEEDED |
|---|--------------------|

Value

DESCRIPTION NEEDED

| | |
|---------------|--|
| min_r_version | <i>Determine a package's minimum R version requirement based on its dependencies</i> |
|---------------|--|

Description

Based on <https://stackoverflow.com/q/38686427>.

Usage

```
min_r_version(package = NULL, exclude_main_pkg = TRUE)
```

Arguments

| | |
|------------------|---|
| package | Character string giving the name of a package whose dependencies should be checked. |
| exclude_main_pkg | Logical indicating whether package should be excluded from the check. Default TRUE. |

Author(s)

hrbrmstr and Jack Wasey

| | |
|---------|---|
| mosaic2 | <i>Merge Raster* objects using a function for overlapping areas</i> |
|---------|---|

Description

Provides a wrapper around `raster::mosaic()` that cleans up any temporary intermediate files used, and sets the layer name of the resulting raster.

Usage

```
mosaic2(x, y, ...)
```

```
## S4 method for signature 'RasterLayer,RasterLayer'
mosaic2(
  x,
  y,
  ...,
  fun,
  tolerance = 0.05,
  filename = NULL,
  layerName = "layer",
```



```

    inRAM = FALSE
  )

  ## S4 method for signature 'SpatRaster,SpatRaster'
  mosaic2(
    x,
    y,
    ...,
    fun,
    tolerance = 0.05,
    filename = NULL,
    layerName = "layer",
    inRAM = FALSE
  )

```

Arguments

| | |
|-----------|--|
| x | Raster* object |
| y | Raster* object |
| ... | Additional Raster or Extent objects. |
| fun | Function (e.g., mean, min, or max, that accepts a na.rm argument). |
| tolerance | Numeric. Permissible difference in origin (relative to the cell resolution). See all.equal() . |
| filename | Character. Output filename (optional). |
| layerName | Character. Name of the resulting raster layer. |
| inRAM | Logical (default FALSE) indicating whether function operations should be performed in memory or, if TRUE, using temporary files. |

Author(s)

Alex Chubaty

outerBuffer *Draw convex hull around polygons*

Description

Draws a convex hull around vertice points of a polygon shapefile, creating a single polygon. If a buffer distance is supplied, will buffer the convex hull inwards or outwards depending on the sign of the distance value.

Usage

```
outerBuffer(x, b = NULL)
```

Arguments

- x A `SpatialPolygons*` object
- b Optional. Distance to buffer. If the value is negative, the buffer will be drawn inwards.

Value

A `SpatialPolygons` object.

Author(s)

Ceres Barros and Alex Chubaty

See Also

[raster::buffer\(\)](#)

pkgSrc

Determine source of installed packages

Description

Which packages were installed from CRAN, GitHub, Bioconductor, etc.?

Usage

```
pkgSrc(pkg, lib.loc = NULL)
```

Arguments

- pkg a character string with the package name.
- lib.loc a character vector of directory names of R libraries, or NULL. The default value of NULL corresponds to all libraries currently known. If the default is used, the loaded packages and namespaces are searched before the libraries.

Examples

```
pkgs <- as.data.frame(installed.packages(), stringsAsFactors = FALSE)
ids <- which(!(pkgs$Priority %in% c("base", "recommended")))
pkgs <- pkgs[ids, ]
pkgs <- pkgs$Package
pkgs[pkgSrc(pkgs) == "CRAN"]
```

| | |
|---------|--------------------------------------|
| rescale | <i>Rescale values to a new range</i> |
|---------|--------------------------------------|

Description

Rescale values to a new range

Usage

```
rescale(x, to, from, ...)

## S3 method for class 'numeric'
rescale(x, to = c(0, 1), from = range(x, na.rm = TRUE, finite = TRUE), ...)

## S3 method for class 'RasterLayer'
rescale(
  x,
  to = c(0, 1),
  from = range(getValues(x), na.rm = TRUE, finite = TRUE),
  ...
)

## S3 method for class 'SpatRaster'
rescale(
  x,
  to = c(0, 1),
  from = range(values(x), na.rm = TRUE, finite = TRUE),
  ...
)
```

Arguments

| | |
|------|---|
| x | A numeric vector or Raster* object. |
| to | The lower and upper bounds of the new range. Default c(0, 1). |
| from | (optional) The lower and upper bounds of the old range (calculated from x). |
| ... | Additional arguments (not used). |

Value

A new object whose values have been rescaled.

Note

Objects with values that are all equal (e.g., all zeroes) will be returned as-is. This behaviour differs from `scales::rescale` which would return a value of 0.5.

Examples

```
rescale(50, from = c(0, 100), to = c(0, 1)) ## 0.5

x <- 0:100
rescale(x) ## defaults to new range [0,1]
rescale(x, c(-1, 1))

f <- system.file("external/test.grd", package = "raster")
r <- raster::raster(f)
rescale(r) ## defaults to new range [0,1]
rescale(r, c(-1, 1))

f <- system.file("ex/test.grd", package = "terra")
r <- terra::rast(f)
rescale(r) ## defaults to new range [0,1]
rescale(r, c(-1, 1))
```

rndstr

Generate random strings

Description

Generate a vector of random alphanumeric strings each of an arbitrary length.

Usage

```
rndstr(n = 1, len = 8)
```

Arguments

| | |
|-----|---|
| n | Number of strings to generate (default 1). Will attempt to coerce to integer value. |
| len | Length of strings to generate (default 8). Will attempt to coerce to integer value. |

Value

Character vector of random strings.

Author(s)

Alex Chubaty

Examples

```
set.seed(11)
rndstr()
rndstr(len = 10)
rndstr(n = 5, len = 10)
rndstr(n = 5)
```

| | |
|---------------|--|
| source_github | <i>Source a file hosted in a public or private GitHub repo</i> |
|---------------|--|

Description

Source a file hosted in a public or private GitHub repo

Usage

```
source_github(repo, branch = "master", file, auth = Sys.getenv("GITHUB_PAT"))
```

Arguments

| | |
|--------|---|
| repo | Name of the GitHub repository in the form "user/repo". |
| branch | Branch from which to source the file (default master). |
| file | Filename to source, including relative path. |
| auth | Personal Access Token to use for authorization. Required to access files in private repositories. By default, checks for GITHUB_PAT environment variable. See https://help.github.com/articles/creating-an-access-token-for-command-line-use/ . |

Author(s)

Alex Chubaty

Examples

```
## Not run:
repo = "PredictiveEcology/SpaDES"
branch = "development"
file = "_ignore/thinSpatialPolygons.R"
auth = "" ## your Personal Access Token

source_github(repo, branch, file, auth)

## End(Not run)
```

| | |
|----------|----------------------------|
| systemem | <i>Check system memory</i> |
|----------|----------------------------|

Description

This tells you the **TOTAL** system memory (RAM) available. Other processes running on the computer will eat into this total, and as such, you should take these numbers with a grain of salt.

Usage

```
systemem(x = "GB")
```

Arguments

x Units to use for output. One of either "KB", "MB", "GB".

Value

Total amount of system memory (RAM) in units.

Author(s)

Alex Chubaty

Examples

```
systemem()
```

td *Temporary directory and file creation*

Description

These are wrappers around `tempdir` and `tempfile` that creates the directory or file, to ensure a correctly normalized filepath (i.e., on macOS).

Usage

```
td(dir = tempdir())
```

```
tf(ext = ".tif", dir = td())
```

Arguments

dir Path to use as temporary directory. A subdirectory will be created. Default is to use the R session temporary directory.

ext File extension to give to the newly create file.

Value

Character string indicating the filepath to the newly created file.

Author(s)

Alex Chubaty

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