

# R Package `miscset`

## User Manual

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# Part I

## Preface

### 1 Introduction

The package **miscset** provides several R tools to read, create, modify and write different types of data. In the following examples, all available functions will be presented including explanations of their usage. Find the source code online at [github](#).

### 2 Installation

To install the package call the command `install.packages("miscset")` within the R console or run R CMD `install miscset` from a terminal. To use it the `library` or `require` function load the package. For the most recent version use `install_github` from the package `devtools` with the parameters `repo='svenetempler/miscset'`.

```
require(miscset)

## Loading required package: miscset
```

## Part II

## Functions

### 3 Apply Functions

#### 3.1 Apply a function on a data.frame by a grid - gapply

To apply a function on a subset of a dataset, all named columns are used to create a grid for which each unique combination is used to extract the rows in the `data.frame`. Multicore support is implemented by `mclapply`. The grid can be extracted by the function `levels` and a row binding of elements that can be coerced to data.frames is implemented in the method `as.data.frame`. If a `data.table` is preferred, the method `as.data.table` is implemented and works only if the package is installed.

```
f <- function (x) c(conc.diff = diff(range(x$conc)), uptake.sum=sum(x$uptake))
d <- gapply(CO2, c('Type', 'Treatment'), f)
levels(d)

##           Type Treatment
## 1      Quebec nonchilled
## 2 Mississippi nonchilled
## 3      Quebec   chilled
## 4 Mississippi   chilled

head(as.data.frame(d))

##   conc.diff uptake.sum      Type Treatment
## 1      905      742.0    Quebec nonchilled
## 2      905      545.0 Mississippi nonchilled
## 3      905      666.8    Quebec   chilled
## 4      905      332.1 Mississippi   chilled
```

## 4 Numeric Functions

### 4.1 Generate triangular numbers - ntri

The function generates a series of triangular numbers of length `n` according to [oeis.org](https://oeis.org).

```
ntri(12)

## [1] 0 1 3 6 10 15 21 28 36 45 55 66
```

### 4.2 Scale numeric vectors - scale0

The function scales all values in a numeric vector from 0 to 1.

```
scale0(0:10)

## [1] 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

scale0(-1:3)

## [1] 0.00 0.25 0.50 0.75 1.00

scale0(2:3)

## [1] 0 1
```

## 5 Data Formatting

### 5.1 Transform to squared matrix - squarematrix

The function `squarematrix` can generate a symmetric (square) matrix from an unsymmetric matrix by using the column and row names and filling empty pairs with `NA`.

```
M <- matrix(1:6, 2, dimnames = list(2:3, 1:3))
M

##   1 2 3
## 2 1 3 5
## 3 2 4 6

squarematrix(M)

##   1 2 3
## 1 NA NA NA
## 2 1 3 5
## 3 2 4 6
```

### 5.2 Generate a pairwise list - enpaire

The function `enpaire` creates a pairwise list of matrix values. The result is a `data.frame` that contains a column for the names of each dimension and the upper and lower triangle values. Unsymmetric matrices are transformed by `squarematrix` (see previous section).

```
M <- matrix(letters[1:9], 3, 3, dimnames = list(1:3, 1:3))
M
```

```
##      1      2      3
## 1 "a" "d" "g"
## 2 "b" "e" "h"
## 3 "c" "f" "i"
```

```
enpaire(M)
```

```
##      row col lower upper
## 1      1      2      b      d
## 2      1      3      c      g
## 3      2      3      f      h
```

## 6 Data Exporting

### 6.1 Create a latex document containing a table - `textable`

This function enhances the functionality of the `xtable` function from the similar named package. The output of `xtable` is captured, processed and then written to a file. The file contains also latex header for an A4 portrait or landscape article. The function is called with the following syntax: `textable(d, file, caption, rownames, landscape, pt.size, margin, digits, align, label)`

`file` is a character string with the name to the file of the function output. `caption` is a character string with the table's title. `rownames` is logical and allows to switch printing of row names on and off. `landscape` is logical for the orientation of the page, `pt.size` uses an integer value to define the size of the characters. `margin` sets a margin between page and table borders in cm. `digits` defines the number of digits to print for numeric values. With `align` the column alignements can be set. Either a single value or a value for the row names column plus each column in `d`. The possible values are 'r', 'c', 'l' for alignemnt to the right, center or left.

```
textable(head(trees,3), rownames=T, digits=4, align='c', caption='R dataset "trees".')
```

```
## \documentclass[a4paper,10pt]{article}
## \usepackage[a4paper,margin=2cm]{geometry}
## \begin{document}
##
## % latex table generated in R 3.1.0 by xtable 1.7-3 package
## % Fri Jul 11 10:12:45 2014
## \begin{table}[ht]
## \centering
## \begin{tabular}{cccc}
## \hline
## & Girth & Height & Volume \\
## \hline
## 1 & 8.3000 & 70.0000 & 10.3000 \\
## 2 & 8.6000 & 65.0000 & 10.3000 \\
## 3 & 8.8000 & 63.0000 & 10.2000 \\
## \hline
## \end{tabular}
## \caption{R dataset "trees".}
## \end{table}
##
## \end{document}
```

## 7 Text String Manipulation

### 7.1 Prepend zeroes to unify number lengths - `leading0`

The function `leading0` aims to create e.g. index names with a common string length. It creates character strings from numeric values while attaching 0 in front of the number up to a certain length of total digits of each string.

```
paste0("page", leading0(8:10, 3))

## [1] "page008" "page009" "page010"
```

### 7.2 Extract substrings by pattern - `strexttr`

The function `strexttr` splits strings in a character vector by `sep` and extracts all substrings matching a given pattern.

```
s <- c("a1 b1 c1", "a2 b2", "aa a1", "aa", "b1 a1", "bb ab a1")
strexttr(s, "^[ab][[:digit:]]$")

## [1] NA NA "a1" NA NA "a1"

strexttr(s, "^[ab][[:digit:]]$", mult = T)

## [[1]]
## [1] "a1" "b1"
##
## [[2]]
## [1] "a2" "b2"
##
## [[3]]
## [1] "a1"
##
## [[4]]
## [1] NA
##
## [[5]]
## [1] "b1" "a1"
##
## [[6]]
## [1] "a1"

strexttr(s, "^[ab][[:digit:]]$", mult = T, unlist = T)

## [1] "a1" "b1" "a2" "b2" "a1" NA "b1" "a1" "a1"

strexttr(s, "^[c][[:digit:]]$")

## [1] "c1" NA NA NA NA
```

### 7.3 Extract substrings by splitting - `strpart`

Similar to `strexttr` the function `strpart` supplies a method to extract a substring, but by defining the `nth` part of the string split by the separator given in `sep`.

```
s

## [1] "a1 b1 c1" "a2 b2" "aa a1" "aa" "b1 a1" "bb ab a1"
```

```
strpart(s, " ", 2)
## [1] "b1" "b2" "a1" NA    "a1" "ab"
```

## 7.4 Reverse strings - strrev

With `strrev` you can create the reversed version of strings.

```
strrev('!dlroW olleH')
## [1] "Hello World!"

s
## [1] "a1 b1 c1" "a2 b2"    "aa a1"    "aa"        "b1 a1"    "bb ab a1"

strrev(s)
## [1] "1c 1b 1a" "2b 2a"    "1a aa"    "aa"        "1a 1b"    "1a ba bb"
```

## 7.5 Multiple pattern replacement - msub, mgsub

`msub` and `mgsub` behave like `sub` and `gsub` but they replace multiple patterns. Replacement is done in order of the pattern input, and multicore support is enabled by `mclapply` from the `parallel` package.

```
s
## [1] "a1 b1 c1" "a2 b2"    "aa a1"    "aa"        "b1 a1"    "bb ab a1"

msub("A", "X", s)
## [1] "a1 b1 c1" "a2 b2"    "aa a1"    "aa"        "b1 a1"    "bb ab a1"

mgsub("A", "X", s)
## [1] "a1 b1 c1" "a2 b2"    "aa a1"    "aa"        "b1 a1"    "bb ab a1"
```

# 8 Pattern Matching

## 8.1 Get index of expression - gregexprind

```
s
## [1] "a1 b1 c1" "a2 b2"    "aa a1"    "aa"        "b1 a1"    "bb ab a1"

gregexprind("a", s, 1)
## [1] 1 1 1 1 4 4

gregexprind("a", s, 2)
## [1] NA NA 2 2 NA 7

gregexprind("a", s, "last")
## [1] 1 1 4 2 4 7
```

## 8.2 Multiple pattern search - mgrepl

With `mgrepl(patterns, text, ...)` you can search for more than one regular expression, and use a logical function to combine the results for each single expression.

```
s
## [1] "a1 b1 c1" "a2 b2"      "aa a1"      "aa"          "b1 a1"      "bb ab a1"

mgrepl(c("a","b"), s, any)

## [1] TRUE TRUE TRUE TRUE TRUE TRUE

mgrepl(c("a","b"), s, all)

## [1] TRUE TRUE FALSE FALSE TRUE TRUE
```

## 9 Graphical Tools

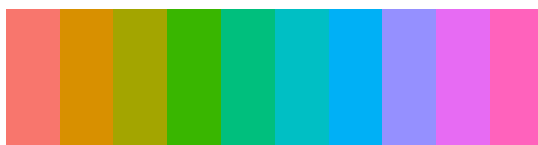
### 9.1 Create a color palette - gghcl

`gghcl()` creates color palettes. It enhances the `hcl` function. See some examples:

**gghcl(5)**



**gghcl(10)**



**gghcl(10, 1:5)**



## 10 System Tools

### 10.1 List details from and remove all objects - lsall, rmall

With `lsall(envir, ...)` all object names, their length, class, mode and size is returned in a data.frame from a specified environment. `rmall(...)` removes the complete list of objects at the global environment.

```
lsall()
```

```
## Environment: R_GlobalEnv
## Objects:
##   Name Length      Class      Mode  Size Unit
## 1    M      9    matrix character   1.3   Kb
## 2    d      4    gapply      list   4.9   Kb
## 3    f      1 function function   2.5   Kb
## 4    s      6 character character 392.0 byte
```

```
rmall()
lsall()
```

```
## Environment: R_GlobalEnv
## Objects:
## NULL
```