

# Package ‘thisutils’

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**Type** Package

**Title** Collection of Utility Functions for Data Analysis and Computing

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**Maintainer** Meng Xu <mengxu98@qq.com>

**Description** Provides utility functions for data analysis and computing. Includes functions for logging, parallel processing, and other computational tasks to streamline workflows.

**License** MIT + file LICENSE

**URL** <https://mengxu98.github.io/thisutils/>

**BugReports** <https://github.com/mengxu98/thisutils/issues>

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thisutils-package      *Collection of Utility Functions for Data Analysis and Computing*

---

### Description

Provides utility functions for data analysis and computing. Includes functions for logging, parallel processing, and other computational tasks to streamline workflows.

### Author(s)

Meng Xu (Maintainer), <mengxu98@qq.com>

### Source

<https://mengxu98.github.io/thisutils/>

### See Also

Useful links:

- <https://mengxu98.github.io/thisutils/>
- Report bugs at <https://github.com/mengxu98/thisutils/issues>

---

add\_pkg\_file      *Add a package file and print package information*

---

### Description

Add a package file and print package information

### Usage

```
add_pkg_file(  
  use_figlet = TRUE,  
  figlet_font = "Slant",  
  colors = c("red", "yellow", "green", "magenta", "cyan", "yellow", "green", "white",  
            "magenta", "cyan"),  
  verbose = TRUE  
)
```

### Arguments

use_figlet	Whether to use figlet for ASCII art generation. Default is TRUE. Details see <a href="#">figlet</a> .
figlet_font	Character string, figlet font to use. Default is "Slant".
colors	Character vector, colors to use for the logo elements.
verbose	Whether to print the message. Default is TRUE.

**Value**

Creates a file named R/<pkg\_name>-package.R.

---

as_matrix	<i>Convert matrix into dense/sparse matrix</i>
-----------	--

---

**Description**

Convert matrix into dense/sparse matrix

**Usage**

```
as_matrix(x, return_sparse = FALSE)
```

**Arguments**

x                    A matrix.  
return\_sparse        Whether to output a sparse matrix. Default is FALSE.

**Value**

A dense or sparse matrix.

**Examples**

```
m <- simulate_sparse_matrix(  
  1000, 1000,  
  decimal = 3  
)  
  
a <- as_matrix(m)  
a[1:5, 1:5]  
  
b <- as_matrix(m, return_sparse = TRUE)  
b[1:5, 1:5]
```

---

capitalize	<i>Capitalize the first letter of each word</i>
------------	---

---

**Description**

Capitalize the first letter of each word

**Usage**

```
capitalize(x, force_tolower = FALSE)
```

**Arguments**

`x` A vector of character strings to be capitalized.  
`force_tolower` Whether to force the remaining letters to be lowercase.

**Examples**

```
x <- c(
  "hello world",
  "hello World"
)
capitalize(x)
```

---

check_ci_env	<i>Check CI environment</i>
--------------	-----------------------------

---

**Description**

Check CI environment

**Usage**

```
check_ci_env()
```

**Value**

A logical value.

---

check_pkg_status	<i>Check if a package is installed with the specified version</i>
------------------	---

---

**Description**

Check if a package is installed with the specified version

**Usage**

```
check_pkg_status(pkg, version = NULL, lib = .libPaths()[1])
```

**Arguments**

pkg	Package name.
version	Package version to check. If NULL, only checks if the package is installed.
lib	The location of the library directories where to install the packages.

**Value**

TRUE if the package is installed with the specified version, FALSE otherwise.

---

check_r	<i>Check and install R packages</i>
---------	-------------------------------------

---

**Description**

Check and install R packages

**Usage**

```
check_r(
  packages,
  lib = .libPaths()[1],
  dependencies = TRUE,
  force = FALSE,
  verbose = TRUE
)
```

**Arguments**

packages	Package to be installed. Package source can be <i>CRAN</i> , <i>Bioconductor</i> or <i>Github</i> . By default, the package name is extracted according to the packages parameter.
lib	The location of the library directories where to install the packages.
dependencies	Whether to install dependencies of the packages. Default is TRUE.
force	Whether to force the installation of packages. Default is FALSE.
verbose	Whether to print the message. Default is TRUE.

**Value**

Package installation status.

---

check_sparsity	<i>Check sparsity of matrix</i>
----------------	---------------------------------

---

**Description**

Check sparsity of matrix

**Usage**

```
check_sparsity(x)
```

**Arguments**

x                    A matrix.

**Value**

Sparsity of matrix.

---

download	<i>Download file from the Internet</i>
----------	--

---

**Description**

Download file from the Internet

**Usage**

```
download(  
  url,  
  destfile,  
  methods = c("auto", "wget", "libcurl", "curl", "wininet", "internal"),  
  quiet = FALSE,  
  ...,  
  max_tries = 2  
)
```

**Arguments**

url	a <a href="#">character</a> string (or longer vector for the "libcurl" method) naming the URL of a resource to be downloaded.
destfile	a character string (or vector, see the url argument) with the file path where the downloaded file is to be saved. Tilde-expansion is performed.
methods	Methods to be used for downloading files. Can be "auto", "wget", "libcurl", "curl", "wininet", "internal". Default is "auto", which means to try different download methods.
quiet	If TRUE, suppress status messages (if any), and the progress bar.
...	Other arguments passed to <a href="#">utils::download.file</a> .
max_tries	Number of tries for each download method. Default is 2.

---

 figlet

*The figlet function*


---

**Description**

Create ASCII art text using figlet.

**Usage**

```
figlet(
  text,
  font = "Slant",
  width = getOption("width", 80),
  justify = "left",
  absolute = FALSE,
  strip = TRUE
)
```

**Arguments**

text	Text to make bigger.
font	Name of font, path to font, or figlet_font object.
width	Width to use when justifying and breaking lines.
justify	Text justification to use in rendering ("left", "centre", "right").
absolute	Logical, indicating if alignment is absolute.
strip	Logical, indicating if whitespace should be removed.

**Value**

An object of class figlet\_text which is a character vector with a handy print method.

**References**

<https://github.com/richfitz/rfiglet>, <https://github.com/jbkunst/figletr>, <https://www.figlet.org/>

**Examples**

```
figlet("thisutils")
```

---

figlet_font	<i>Get a figlet font</i>
-------------	--------------------------

---

**Description**

Get a figlet font

**Usage**

```
figlet_font(font)
```

**Arguments**

font	Path or name of the font to load
------	----------------------------------

**Value**

A 'figlet\_font' object for use with [figlet]

---

get_namespace_fun	<i>Get a function from a namespace</i>
-------------------	--

---

**Description**

Get a function from a namespace

**Usage**

```
get_namespace_fun(pkg, fun)
```

**Arguments**

pkg	The name of the package.
fun	The name of the function.

**Value**

Function.

---

get_verbose	<i>Get the verbose option</i>
-------------	-------------------------------

---

**Description**

Get the verbose option from the global options or the local argument.

**Usage**

```
get_verbose(verbose = NULL)
```

**Arguments**

verbose	The verbose option. Default is 'NULL', which means to get the verbose option from the global options.
---------	---

**Value**

The verbose option.

**Examples**

```
get_verbose()
get_verbose(verbose = FALSE)
get_verbose(verbose = TRUE)

options(log_message.verbose = FALSE)
get_verbose()
get_verbose(verbose = TRUE)

options(log_message.verbose = TRUE)
get_verbose()

options(log_message.verbose = NULL)
```

---

invoke_fun	<i>Invoke a function with a list of arguments</i>
------------	---

---

**Description**

Invoke a function with a list of arguments

**Usage**

```
invoke_fun(.fn, .args = list(), ..., .env = rlang::caller_env())
```

**Arguments**

.fn	A function, or function name as a string.
.args	A list of arguments.
...	Other arguments passed to the function.
.env	Environment in which to evaluate the call. This will be most useful if .fn is a string, or the function has side-effects.

**Examples**

```
f <- function(x, y) {
  x + y
}
invoke_fun(f, list(x = 1, y = 2))
invoke_fun("f", list(x = 1, y = 2))
invoke_fun("f", x = 1, y = 2)
```

---

is_outlier	<i>Detect outliers using MAD (Median Absolute Deviation)</i>
------------	--

---

**Description**

Detect outliers using MAD (Median Absolute Deviation)

**Usage**

```
is_outlier(
  x,
  nmads = 2.5,
  constant = 1.4826,
  type = c("both", "lower", "higher")
)
```

**Arguments**

x	Numeric vector.
nmads	Number of MADs from the median to define the boundaries for outliers. Default is 2.5.
constant	Constant factor to convert the MAD to a standard deviation. Default is 1.4826, which is consistent with the MAD of a normal distribution.
type	Type of outliers to detect. Available options are "both", "lower", or "higher". If type is "both", it detects both lower and higher outliers. If type is "lower", it detects only lower outliers. If type is "higher", it detects only higher outliers.

**Value**

Numeric vector of indices indicating the positions of outliers in x.

**Examples**

```
x <- c(1, 2, 3, 4, 5, 100)
is_outlier(x) # returns 6

x <- c(3, 4, 5, NA, 6, 7)
is_outlier(x, nmads = 1.5, type = "lower") # returns 4

x <- c(10, 20, NA, 15, 35)
is_outlier(x, nmads = 2, type = "higher") # returns 3, 5
```

---

log_message	<i>Print formatted message</i>
-------------	--------------------------------

---

**Description**

Integrate the message printing function with the `cli` package, and the `base::message` function. The message could be suppressed by `base::suppressMessages`.

**Usage**

```
log_message(
  ...,
  verbose = TRUE,
  message_type = c("info", "success", "warning", "error", "running", "ask"),
  cli_model = TRUE,
  level = 1,
  symbol = " ",
  text_color = NULL,
  back_color = NULL,
  text_style = NULL,
  multiline_indent = FALSE,
  timestamp = TRUE,
  timestamp_format = paste0("[", format(Sys.time(), "%Y-%m-%d %H:%M:%S"), "] "),
  timestamp_style = FALSE,
  plain_text = FALSE,
  .envir = parent.frame(),
  .frame = .envir
)
```

**Arguments**

...	The message to print.
verbose	Whether to print the message. Default is TRUE.
message_type	Type of message. Could be choose one of "info", "success", "warning", "error", "running", and "ask". When "ask" is used, the function will prompt the user for a Yes/No/Cancel response using <code>utils::askYesNo</code> , and returns TRUE for Yes, FALSE for No, and NA for Cancel. Default is "info".

cli_model	Whether to use the cli package to print the message. Default is TRUE.
level	The level of the message, which affects the indentation. Level 1 has no indentation, higher levels add more indentation. Default is 1.
symbol	The symbol used for indentation. When specified, it ignores the level parameter and uses the symbol directly. Default is " " (two spaces).
text_color	Color for the message text. Supports R color names (e.g., "orange"), hexadecimal colors (e.g., "#000000"), basic colors: "red", "green", "blue", "yellow", "magenta", "cyan", "white", "black", "grey", "silver", "none", and bright colors: "br_red", "br_green", "br_blue", "br_yellow", "br_magenta", "br_cyan", "br_white", "br_black". Default is NULL.
back_color	Background color for the message text. Details see parameter text_color. Default is NULL.
text_style	Text styles to apply. Can be one or more of: "bold", "italic", "underline", "strikethrough", "dim", "inverse". Multiple styles can be combined (e.g., c("bold", "underline")). Default is NULL.
multiline_indent	Whether to apply consistent formatting (timestamp and indentation) to each line in multiline messages. When TRUE, each line gets the full formatting; when FALSE, only the first line gets the timestamp. Default is FALSE.
timestamp	Whether to show the current time in the message. Default is TRUE.
timestamp_format	Format string for timestamp display. Default is "%Y-%m-%d %H:%M:%S".
timestamp_style	Whether to apply the same text styling to the timestamp as the message text. When TRUE, timestamp formatting matches the message; when FALSE, timestamp keeps its default appearance. Default is FALSE.
plain_text	Whether to print only the text content. When TRUE, level, symbol, timestamp, and message type formatting are suppressed, but color and multiline settings still apply.
.envir	The environment to evaluate calls in. Default is <a href="#">parent.frame</a> .
.frame	The frame to use for error reporting. Default is .envir.

**Value**

Formatted message, or a logical value (TRUE/FALSE/NA) if message\_type = "ask".

**References**

<https://cli.r-lib.org/articles/index.html>

**Examples**

```
# basic usage
log_message("Hello, ", "world!")

log_message("hello, world!")
```

```
log_message("Hello, world!", timestamp = FALSE)

log_message(
  "Hello, ", "world!",
  message_type = "success"
)

log_message(
  "Hello, world!",
  message_type = "warning"
)

log_message(
  "Processing data...",
  message_type = "running"
)

log_message(
  "Hello, ", "world!",
  cli_model = FALSE
)

# suppress messages
suppressMessages(log_message("Hello, world!"))
log_message("Hello, world!", verbose = FALSE)
options(log_message.verbose = FALSE)
log_message("Hello, world!")

# for global verbose option
options(log_message.verbose = TRUE)
log_message("Hello, world!", verbose = FALSE)
options(log_message.verbose = NULL)

# cli inline markup
log_message("{.arg abc} is a argument")

## 'message' can not deal with cli inline markup
message("hello, {.code world}!")

log_message("{.val list('abc')} is a {.cls {class(list('abc'))}}")

log_message("{.code lm(y ~ x)} is a code example")

log_message("{.dt List}list('abc')")

log_message("address: {.email example@example.com}")

log_message("{.emph R} is a programming language")

log_message("{.envvar R_HOME}")
```

```
log_message("{.file log_message.R} is a file")

log_message("{.fn lm} is a function")

log_message("{.fun lm} is a function")

log_message("{.help lm} to get help")

log_message("... see {.help [{.fun lm}](stats::lm)} to learn more")

log_message(
  "See the {.href [cli homepage](https://cli.r-lib.org)} for details"
)

log_message("press {.kbd ENTER}")

log_message("press {.key ENTER}")

log_message("URL: {.url https://cli.r-lib.org}")

log_message("Some {.field field}")

log_message("{.path /usr/bin/R} is a path")

log_message("{.pkg cli} is a package")

log_message("{.val object} is a variable")

log_message("{.run Rscript log_message.R} is a runnable file")

log_message("{.str object} is a string")

log_message("{.strong abc} is a strong string")

log_message("{.topic stats::lm} is a topic")

log_message("{.vignette cli} is a vignette")

# set indentation
log_message("Hello, world!", level = 2)

log_message("Hello, world!", symbol = "->")

log_message(
  "Hello, world!",
  symbol = "####",
  level = 3
)

# color formatting
log_message(
```

```
    "This is a red message",
    text_color = "#ff9900"
)

log_message(
    "This is a message with background",
    back_color = "#EE4000"
)

log_message(
    "This is a message with both text and background",
    text_color = "white",
    back_color = "cyan"
)

log_message(
    "This is a message with background",
    back_color = "#EE4000",
    cli_model = FALSE
)

log_message(
    "This is a message with both text and background",
    text_color = "red",
    back_color = "cyan",
    cli_model = FALSE
)

log_message(
    "Hex color with {.arg cli_model = FALSE}",
    text_color = "#FF5733",
    cli_model = FALSE
)

log_message(
    "Bright red text",
    text_color = "br_red"
)

log_message(
    "Bright background",
    back_color = "br_yellow"
)

log_message(
    "Combined grey and style",
    text_color = "grey",
    text_style = "bold"
)

# text style formatting
log_message(
    "Bold message",
```

```
    text_style = "bold"
)

log_message(
    "Italic message",
    text_style = "italic"
)

log_message(
    "Underlined message",
    text_style = "underline"
)

log_message(
    "Combined styles",
    text_style = c("bold", "underline")
)

log_message(
    "Color and style",
    text_color = "blue",
    text_style = c("bold", "italic")
)

log_message(
    "Hex color and style",
    text_color = "#FF5733",
    text_style = c("bold", "underline")
)

# multiline message
log_message(
    "Line 1\nLine 2\nLine 3",
    multiline_indent = TRUE,
    text_style = "italic"
)

log_message(
    "Multi-line\ncolored\nmessage",
    text_color = "blue",
    text_style = "italic"
)

log_message(
    "Multi-line\ncolored\nmessage",
    text_color = "blue",
    timestamp = FALSE
)

# timestamp styling
log_message(
    "Multi-line message\nwith timestamp styling",
```

```

    text_color = "red",
    text_style = "bold",
    timestamp_style = TRUE
  )

  log_message(
    "Multi-line message\nwithout timestamp styling",
    text_color = "#669999",
    text_style = c("bold", "italic")
  )

# combine cli package and log_message
log_message(
  cli::col_green(
    "I am a green line ",
    cli::col_blue(
      cli::style_underline(
        cli::style_bold("with a blue substring")
      )
    ),
    " that becomes green again!"
  )
)

# cli variables
fun <- function(x = 1) {
  log_message("{.val x}")
  log_message("{.val {x}}")
  log_message("{.val {x + 1}}")
}
fun()

# print objects directly
df <- data.frame(
  x = 1:3,
  y = letters[1:3],
  z = c(" a", "b ", "c")
)
log_message("Content:\n", df)

# interactive prompt
if (interactive()) {
  log_message(
    "Do you want to continue?",
    message_type = "ask"
  )
}

```

**Description**

Process matrix

**Usage**

```
matrix_process(
  matrix,
  method = c("raw", "zscore", "fc", "log2fc", "log1p"),
  ...
)
```

**Arguments**

matrix            A matrix.  
 method            Method to use for processing the matrix.  
 ...                Other arguments passed to the method.

**Value**

A processed matrix.

**Examples**

```
m <- simulate_sparse_matrix(10, 10)
matrix_process(m, method = "raw")
matrix_process(m, method = "zscore")
matrix_process(m, method = "fc")
matrix_process(m, method = "log2fc")
matrix_process(m, method = "log1p")
m <- as_matrix(m)
matrix_process(m, method = function(x) x / rowMeans(x))
```

---

matrix_to_table	<i>Switch matrix to table</i>
-----------------	-------------------------------

---

**Description**

Switch matrix to table

**Usage**

```
matrix_to_table(
  matrix,
  row_names = NULL,
  col_names = NULL,
  threshold = 0,
  keep_zero = TRUE
)
```

**Arguments**

<code>matrix</code>	A matrix.
<code>row_names</code>	Character vector of row names to filter by.
<code>col_names</code>	Character vector of column names to filter by.
<code>threshold</code>	The threshold for filtering values based on absolute values. Defaults to 0.
<code>keep_zero</code>	Whether to keep zero values in the table. Defaults to <code>false</code> .

**Value**

A table with three columns: row, col, and value.

**See Also**

[table\\_to\\_matrix](#)

**Examples**

```
test_matrix <- simulate_sparse_matrix(10, 10)
colnames(test_matrix) <- paste0("c", 1:10)
rownames(test_matrix) <- paste0("r", 1:10)
table <- matrix_to_table(test_matrix)
matrix_new <- table_to_matrix(table)
test_matrix <- test_matrix[rownames(matrix_new), colnames(matrix_new)] |>
  as_matrix()
identical(test_matrix, matrix_new)

matrix_to_table(
  test_matrix,
  threshold = 2
)

matrix_to_table(
  test_matrix,
  row_names = c("r1", "r2"),
  col_names = c("c1", "c2")
)
```

---

maximump

*Maximum P-value*

---

**Description**

Maximum P-value

**Usage**

```
maximump(p, alpha = 0.05, log.p = FALSE)
```

**Arguments**

- `p`                    A vector of P-values.
- `alpha`                The significance level.
- `log.p`                Whether to return the log of the P-value.

**Examples**

```
p <- c(0.01, 0.02, 0.03, 0.04, 0.05)
maximump(p)
maximump(p, alpha = 0.01)
maximump(p, log.p = TRUE)
```

---

<code>max_depth</code>	<i>Maximum depth of a list</i>
------------------------	--------------------------------

---

**Description**

Maximum depth of a list

**Usage**

```
max_depth(x, depth = 0)
```

**Arguments**

- `x`                    A list.
- `depth`                The depth of the list.

**Examples**

```
x <- list(
  a = list(b = list(c = 1)),
  d = list(e = list(f = 2))
)
max_depth(x)
```

meanp                      *Mean P-value*

---

**Description**

Mean P-value

**Usage**

```
meanp(p)
```

**Arguments**

p                      A vector of P-values.

**Examples**

```
p <- c(0.01, 0.02, 0.03, 0.04, 0.05)
meanp(p)
```

---

minimump                      *Minimum P-value*

---

**Description**

Minimum P-value

**Usage**

```
minimump(p, alpha = 0.05, log.p = FALSE)
```

**Arguments**

p                      A vector of P-values.  
alpha                      The significance level.  
log.p                      Whether to return the log of the P-value.

**Examples**

```
p <- c(0.01, 0.02, 0.03, 0.04, 0.05)
minimump(p)
minimump(p, alpha = 0.01)
minimump(p, log.p = TRUE)
```

---

normalization	<i>Normalize numeric vector</i>
---------------	---------------------------------

---

**Description**

Normalize numeric vector

**Usage**

```
normalization(x, method = "max_min", na_rm = TRUE, ...)
```

**Arguments**

x	Input numeric vector.
method	Method used for normalization.
na_rm	Whether to remove NA values, and if setting TRUE, using 0 instead. Default is TRUE.
...	Parameters for other methods.

**Value**

Normalized numeric vector.

**Examples**

```
x <- c(runif(2), NA, -runif(2))
x
normalization(x, method = "max_min")
normalization(x, method = "maximum")
normalization(x, method = "sum")
normalization(x, method = "softmax")
normalization(x, method = "z_score")
normalization(x, method = "mad")
normalization(x, method = "unit_vector")
normalization(x, method = "unit_vector", na_rm = FALSE)
```

---

parallelize_fun	<i>Parallelize a function</i>
-----------------	-------------------------------

---

**Description**

Parallelize a function

**Usage**

```
parallelize_fun(
  x,
  fun,
  cores = 1,
  export_fun = NULL,
  clean_result = FALSE,
  throw_error = TRUE,
  timestamp_format = paste0("[", format(Sys.time(), "%Y-%m-%d %H:%M:%S"), "] "),
  verbose = TRUE
)
```

**Arguments**

x	A vector or list to apply over.
fun	The function to be applied to each element.
cores	The number of cores to use for parallelization with <code>foreach::foreach</code> . Default is 1.
export_fun	The functions to export the function to workers.
clean_result	Whether to remove failed results from output. If FALSE, failed results are kept as error objects. Default is FALSE.
throw_error	Whether to print detailed error information for failed results. Default is TRUE.
timestamp_format	Format string for timestamp display. Default is "%Y-%m-%d %H:%M:%S".
verbose	Whether to print the message. Default is TRUE.

**Value**

A list of computed results. If `clean_result = FALSE`, failed results are included as error objects. If `clean_result = TRUE`, only successful results are returned.

**Examples**

```
parallelize_fun(1:3, function(x) {
  Sys.sleep(0.2)
  x^2
})

parallelize_fun(list(1, 2, 3), function(x) {
  Sys.sleep(0.2)
  x^2
}, cores = 2)

# Examples with error handling
parallelize_fun(1:5, function(x) {
  if (x == 3) stop("Error on element 3")
  x^2
}, clean_result = FALSE)
```

```
parallelize_fun(1:5, function(x) {
  if (x == 3) stop("Error on element 3")
  x^2
}, clean_result = TRUE)

# Control error printing
parallelize_fun(1:5, function(x) {
  if (x == 2) stop("Error on element 3")
  if (x == 4) stop("Error on element 4")
  x^2
})

parallelize_fun(1:5, function(x) {
  if (x == 3) stop("Error on element 3")
  x^2
}, throw_error = FALSE)
```

---

parse\_inline\_expressions

*Parse inline expressions*

---

## Description

Parse “ inline expressions and evaluate them in the current environment, while preserving outer formatting markers like ‘{.val ...}’.

## Usage

```
parse_inline_expressions(text, env = parent.frame())
```

## Arguments

text	A character string containing inline expressions to parse.
env	Environment in which to evaluate expressions. Defaults to the calling environment.

## Value

A character string with expressions evaluated but formatting preserved.

## Examples

```
i <- 1
parse_inline_expressions(
  "{.val {i}}"
)

x <- 5
```

```
y <- 10
parse_inline_expressions(
  "{.pkg {x + y}}"
)

name <- "testing"
name <- parse_inline_expressions(
  "{.pkg {name}}"
)
name

log_message(name)
```

---

pearson\_correlation    *Correlation and covariance calculation for sparse matrix*

---

### Description

Correlation and covariance calculation for sparse matrix

### Usage

```
pearson_correlation(x, y = NULL)
```

### Arguments

x                    Sparse matrix or character vector.  
y                    Sparse matrix or character vector.

### Value

A list with covariance and correlation matrices.

### Examples

```
m1 <- simulate_sparse_matrix(
  100, 100
)
m2 <- simulate_sparse_matrix(
  100, 100,
  sparsity = 0.05
)
a <- pearson_correlation(m1, m2)
a$cov[1:5, 1:5]
a$cor[1:5, 1:5]
```

---

print.thisutils\_logo *Print logo*

---

**Description**

Print logo

**Usage**

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

**Arguments**

x	Input information.
...	Other parameters.

**Value**

Print the ASCII logo

---

remove\_r *Check and remove R packages*

---

**Description**

Check and remove R packages

**Usage**

```
remove_r(packages, lib = .libPaths()[1], verbose = TRUE)
```

**Arguments**

packages	Package to be removed.
lib	The location of the library directories where to remove the packages.
verbose	Whether to print the message. Default is TRUE.

---

remove_space	<i>Remove and normalize spaces</i>
--------------	------------------------------------

---

### Description

Remove and normalize spaces

### Usage

```
remove_space(  
  x,  
  trim_start = TRUE,  
  trim_end = FALSE,  
  collapse_multiple = TRUE,  
  preserve_newlines = TRUE  
)
```

### Arguments

x	A vector of character strings.
trim_start	Whether to remove leading spaces before the first word. Default is TRUE.
trim_end	Whether to remove trailing spaces after the last word. Default is FALSE.
collapse_multiple	Whether to collapse multiple consecutive spaces between words into a single space. Default is TRUE.
preserve_newlines	Whether to preserve newline characters when collapsing spaces. Default is TRUE.

### Value

A character vector with spaces normalized according to the specified parameters.

### Examples

```
x <- c(  
  " hello world ",  
  " test case ",  
  "no space",  
  " multiple spaces "  
)  
remove_space(x)  
remove_space(x, trim_start = FALSE)  
remove_space(x, trim_end = TRUE)  
remove_space(x, collapse_multiple = FALSE)  
remove_space(  
  x,
```

```
    trim_start = FALSE,
    trim_end = FALSE,
    collapse_multiple = FALSE
  )

  # with newlines
  multiline <- c(
    "hello\n\n world ",
    " first \n second "
  )
  remove_space(multiline)
  remove_space(multiline, preserve_newlines = FALSE)
```

---

r\_square

*Coefficient of determination ( $R^2$ )*

---

### Description

Coefficient of determination ( $R^2$ )

### Usage

```
r_square(y_true, y_pred)
```

### Arguments

y\_true            A numeric vector with ground truth values.  
y\_pred            A numeric vector with predicted values.

### Value

The  $R^2$  value.

### Examples

```
y <- rnorm(100)
y_pred <- y + rnorm(100, sd = 0.5)
r_square(y, y_pred)
```

---

`simulate_sparse_matrix`*Generate a simulated sparse matrix*

---

### Description

This function generates a sparse matrix with a specified number of rows and columns, a given sparsity level, and a distribution function for the non-zero values.

### Usage

```
simulate_sparse_matrix(  
  nrow,  
  ncol,  
  sparsity = 0.95,  
  distribution_fun = function(n) stats::rpois(n, lambda = 0.5) + 1,  
  decimal = 0,  
  seed = 1  
)
```

### Arguments

<code>nrow</code>	Number of rows in the matrix.
<code>ncol</code>	Number of columns in the matrix.
<code>sparsity</code>	Proportion of zero elements (sparsity level). Default is 0.95, meaning 95% of elements are zero (5% are non-zero).
<code>distribution_fun</code>	Function to generate non-zero values.
<code>decimal</code>	Controls the number of decimal places in the generated values. If set to 0, values will be integers. When <code>decimal &gt; 0</code> , random decimal parts are uniformly distributed across the full range. Default is 0.
<code>seed</code>	Random seed for reproducibility.

### Value

A sparse matrix of class "dgCMatrix".

### Examples

```
simulate_sparse_matrix(1000, 500) |>  
  check_sparsity()  
  
simulate_sparse_matrix(10, 10, decimal = 1)  
simulate_sparse_matrix(10, 10, decimal = 5)
```

---

sparse_cor	<i>Sparse correlation function</i>
------------	------------------------------------

---

## Description

Safe correlation function which returns a sparse matrix.

## Usage

```
sparse_cor(  
  x,  
  y = NULL,  
  method = "pearson",  
  allow_neg = TRUE,  
  remove_na = TRUE,  
  remove_inf = TRUE,  
  ...  
)
```

## Arguments

x	Sparse matrix or character vector.
y	Sparse matrix or character vector.
method	Method to use for calculating the correlation coefficient.
allow_neg	Logical. Whether to allow negative values or set them to 0.
remove_na	Logical. Whether to replace NA values with 0.
remove_inf	Logical. Whether to replace infinite values with 1.
...	Other arguments passed to <code>stats::cor</code> function.

## Value

A correlation matrix.

## Examples

```
m1 <- simulate_sparse_matrix(  
  500, 100  
)  
m2 <- simulate_sparse_matrix(  
  500, 100,  
  seed = 2025  
)  
a <- sparse_cor(m1)  
b <- sparse_cor(m1, m2)  
c <- as_matrix(  
  cor(as_matrix(m1)),
```

```

    return_sparse = TRUE
  )
  d <- as_matrix(
    cor(as_matrix(m1), as_matrix(m2)),
    return_sparse = TRUE
  )

  a[1:5, 1:5]
  c[1:5, 1:5]
  all.equal(a, c)

  b[1:5, 1:5]
  d[1:5, 1:5]
  all.equal(b, d)

  m1[sample(1:500, 10)] <- NA
  m2[sample(1:500, 10)] <- NA

  sparse_cor(m1, m2)[1:5, 1:5]

  system.time(
    sparse_cor(m1)
  )
  system.time(
    cor(as_matrix(m1))
  )

  system.time(
    sparse_cor(m1, m2)
  )
  system.time(
    cor(as_matrix(m1), as_matrix(m2))
  )

```

---

split\_indices

*Split indices.*


---

### Description

An optimised version of split for the special case of splitting row indices into groups.

### Usage

```
split_indices(group, n = 0L)
```

### Arguments

group	Integer indices
n	The largest integer (may not appear in index). This is hint: if the largest value of group is bigger than n, the output will silently expand.

**Value**

A list of vectors of indices.

**References**

<https://github.com/hadley/plyr/blob/d57f9377eb5d56107ba3136775f2f0f005f33aa3/src/split-numeric.cpp#L20>

**Examples**

```
split_indices(sample(10, 100, rep = TRUE))
split_indices(sample(10, 100, rep = TRUE), 10)
```

---

sump	<i>Sum P-value</i>
------	--------------------

---

**Description**

Sum P-value

**Usage**

```
sump(p)
```

**Arguments**

p                    A vector of P-values.

**Examples**

```
p <- c(0.01, 0.02, 0.03, 0.04, 0.05)
sump(p)
```

---

table_to_matrix	<i>Switch table to matrix</i>
-----------------	-------------------------------

---

**Description**

Switch table to matrix

**Usage**

```
table_to_matrix(
  table,
  row_names = NULL,
  col_names = NULL,
  threshold = 0,
  return_sparse = FALSE
)
```

**Arguments**

table	A table with three columns: row, col, and value.
row_names	Character vector of row names to filter by.
col_names	Character vector of column names to filter by.
threshold	The threshold for filtering values based on absolute values. Defaults to 0.
return_sparse	Whether to return a sparse matrix. Defaults to false.

**Value**

A matrix.

**See Also**

[matrix\\_to\\_table](#)

**Examples**

```
table <- data.frame(
  row = c("r1", "r2", "r3", "r4", "r5", "r6"),
  col = c("c4", "c5", "c6", "c1", "c2", "c3"),
  value = c(0.6, -0.5, -0.4, 0.3, 0.2, 0.1)
)
matrix <- table_to_matrix(table)
table_new <- matrix_to_table(matrix)
identical(table, table_new)

table_to_matrix(table, threshold = 0.3)

table_to_matrix(
  table,
  row_names = c("r1", "r2"),
  col_names = c("c4", "c5")
)

sparse_matrix <- simulate_sparse_matrix(10, 10)
table_sparse <- matrix_to_table(
  sparse_matrix
)
sparse_matrix_new <- table_to_matrix(
  table_sparse,
  return_sparse = TRUE
)
identical(sparse_matrix, sparse_matrix_new)
```

---

thisutils_logo	<i>The logo of thisutils</i>
----------------	------------------------------

---

**Description**

The thisutils logo, using ASCII or Unicode characters Use `cli::ansi_strip` to get rid of the colors.

**Usage**

```
thisutils_logo(unicode = cli::is_utf8_output())
```

**Arguments**

unicode           Unicode symbols on UTF-8 platforms. Default is `cli::is_utf8_output`.

**Value**

A character vector with class `thisutils_logo`.

**References**

<https://github.com/tidyverse/tidyverse/blob/main/R/logo.R>

**Examples**

```
thisutils_logo()
```

---

try_get	<i>Try to evaluate an expression a set number of times before failing</i>
---------	---

---

**Description**

The function is used as a fail-safe if code sometimes works and sometimes doesn't, usually because it depends on a resource that may be temporarily unavailable. It tries to evaluate the expression `max_tries` times. If all the attempts fail, it throws an error; if not, the evaluated expression is returned.

**Usage**

```
try_get(expr, max_tries = 5, error_message = "", retry_message = "Retrying...")
```

**Arguments**

<code>expr</code>	The expression to be evaluated.
<code>max_tries</code>	The maximum number of attempts to evaluate the expression before giving up. Default is 5.
<code>error_message</code>	Additional custom error message to be displayed when an error occurs.
<code>retry_message</code>	Message displayed when a new try to evaluate the expression would be attempted.

**Value**

The evaluated expression if successful, otherwise it throws an error if all attempts are unsuccessful.

**Examples**

```
f <- function() {
  value <- runif(1, min = 0, max = 1)
  if (value > 0.5) {
    log_message("value is larger than 0.5")
    return(value)
  } else {
    log_message(
      "value is smaller than 0.5",
      message_type = "error"
    )
  }
}
f_evaluated <- try_get(expr = f())
print(f_evaluated)
```

---

unnest\_fun

*Unnest a list-column*


---

**Description**

Implement similar functions to the [tidyr::unnest](#) function.

**Usage**

```
unnest_fun(data, cols, keep_empty = FALSE)
```

**Arguments**

<code>data</code>	A data frame.
<code>cols</code>	Columns to unnest.
<code>keep_empty</code>	By default, you get one row of output for each element of the list your unchopping/unnesting. This means that if there's a size-0 element (like NULL or an empty data frame), that entire row will be dropped from the output. If you want to preserve all rows, use <code>keep_empty = TRUE</code> to replace size-0 elements with a single row of missing values.

**Examples**

```

data <- data.frame(
  id = 1:3,
  x = c("a", "b", "c"),
  stringsAsFactors = FALSE
)
data$data <- list(
  c(1, 2),
  c(3, 4, 5),
  c(6)
)
unnest_fun(data, cols = "data")

data2 <- data.frame(
  id = 1:3,
  x = c("a", "b", "c"),
  stringsAsFactors = FALSE
)
data2$data <- list(
  c(1, 2),
  numeric(0),
  c(6)
)
unnest_fun(data2, cols = "data")
unnest_fun(data2, cols = "data", keep_empty = TRUE)

```

---

votep

*Vote P-value*


---

**Description**

Vote P-value

**Usage**

```
votep(p, alpha = 0.5)
```

**Arguments**

p	A vector of P-values.
alpha	The significance level.

**Examples**

```

p <- c(0.01, 0.02, 0.03, 0.04, 0.05)
votep(p)
votep(p, alpha = 0.01)

```

---

`wilkinsonp`*Wilkinson's P-value*

---

**Description**

Wilkinson's P-value

**Usage**`wilkinsonp(p, r = 1, alpha = 0.05, log.p = FALSE)`**Arguments**

<code>p</code>	A vector of P-values.
<code>r</code>	The number of studies to include in the P-value calculation.
<code>alpha</code>	The significance level.
<code>log.p</code>	Whether to return the log of the P-value.

**Examples**

```
p <- c(0.01, 0.02, 0.03, 0.04, 0.05)
wilkinsonp(p)
wilkinsonp(p, r = 2)
wilkinsonp(p, alpha = 0.01)
wilkinsonp(p, log.p = TRUE)
```

---

`%ss%`*Value selection operator*

---

**Description**

This operator returns the left side if it's not NULL, otherwise it returns the right side.

**Usage**`a %ss% b`**Arguments**

<code>a</code>	The left side value to check.
<code>b</code>	The right side value to use if a is NULL.

**Value**

a if it is not NULL, otherwise b.

*%ss%*

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### **Examples**

NULL %ss% 10  
5 %ss% 10

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