Package ‘xfun’

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attr

Obtain an attribute of an object without partial matching

Description

An abbreviation of base::attr(exact = TRUE).

Usage

attr(...)

Arguments

... Passed to base::attr() (without the exact argument).

Examples

z = structure(list(a = 1), foo = 2)
base::attr(z, "f") # 2
xfun::attr(z, "f") # NULL
xfun::attr(z, "foo") # 2
base64_encode

Encode/decode data into/from base64 encoding.

Description

The function `base64_encode()` encodes a file or a raw vector into the base64 encoding. The function `base64_decode()` decodes data from the base64 encoding.

Usage

```
base64_encode(x)
```

```
based64_decode(x, from = NA)
```

Arguments

- `x` For `base64_encode()`, a raw vector. If not raw, it is assumed to be a file or a connection to be read via `readBin()`. For `base64_decode()`, a string.
- `from` If provided (and `x` is not provided), a connection or file to be read via `readChar()`, and the result will be passed to the argument `x`.

Value

`base64_encode()` returns a character string. `base64_decode()` returns a raw vector.

Examples

```
xfun::base64_encode(as.raw(1:10))
logo = xfun::R_logo()
xfun::base64_encode(logo)
xfun::base64_decode("AQIDBAUGBwgJCg==")
```

base64_uri

Generate the Data URI for a file

Description

Encode the file in the base64 encoding, and add the media type. The data URI can be used to embed data in HTML documents, e.g., in the `src` attribute of the `<img />` tag.

Usage

```
base64_uri(x)
```

Arguments

- `x` A file path.
base_pkgs

Value

A string of the form data:<media type>;base64,<data>.

Examples

logo = xfun::R_logo()
img = htmltools::img(src = xfun::base64_uri(logo), alt = "R logo")
if (interactive()) htmltools::browsable(img)

base_pkgs Get base R package names

Description

Return names of packages from installed.packages() of which the priority is "base".

Usage

base_pkgs()

Value

A character vector of base R package names.

Examples

xfun::base_pkgs()

bg_process Start a background process

Description

Start a background process using the PowerShell cmdlet Start-Process -PassThru on Windows
or the ampersand & on Unix, and return the process ID.

Usage

bg_process(
  command,
  args = character(),
  verbose = getOption("xfun.bg_process.verbose", FALSE)
)

Arguments
command, args The system command and its arguments. They do not need to be quoted, since they will be quoted internally via `shQuote()`.
verbose If FALSE, suppress the output from stdout (and also stderr on Windows). The default value of this argument can be set via a global option, e.g., `options(xfun.bg_process.verbose = TRUE)`.

Value
The process ID as a character string.

Note
On Windows, if PowerShell is not available, try to use `system2(wait = FALSE)` to start the background process instead. The process ID will be identified from the output of the command `tasklist`. This method of looking for the process ID may not be reliable. If the search is not successful in 30 seconds, it will throw an error (timeout). If a longer time is needed, you may set `options(xfun.bg_process.timeout)` to a larger value, but it should be very rare that a process cannot be started in 30 seconds. When you reach the timeout, it is more likely that the command actually failed.

See Also
`proc_kill()` to kill a process.

broken_packages Find out broken packages and reinstall them

Description
If a package is broken (i.e., not `loadable()`), reinstall it.

Usage
`broken_packages(reinstall = TRUE)`

Arguments
reinstall Whether to reinstall the broken packages, or only list their names.

Details
Installed R packages could be broken for several reasons. One common reason is that you have upgraded R to a newer x.y version, e.g., from 4.0.5 to 4.1.0, in which case you need to reinstall previously installed packages.

Value
A character vector of names of broken package.
### bump_version

**Bump version numbers**

**Description**

Increase the last digit of version numbers, e.g., from 0.1 to 0.2, or 7.23.9 to 7.23.10.

**Usage**

```r
bump_version(x)
```

**Arguments**

- `x` A vector of version numbers (of the class "numeric_version"), or values that can be coerced to version numbers via `as.numeric_version()`.

**Value**

A vector of new version numbers.

**Examples**

```r
xfun::bump_version(c("0.1", "91.2.14"))
```

### cache_rds

**Cache the value of an R expression to an RDS file**

**Description**

Save the value of an expression to a cache file (of the RDS format). Next time the value is loaded from the file if it exists.

**Usage**

```r
cache_rds(
  expr = { },
  rerun = FALSE,
  file = "cache.rds",
  dir = "cache/",
  hash = NULL,
  clean = getOption("xfun.cache_rds.clean", TRUE),
  ...
)
```
**cache_rds**

**Arguments**

- **expr**: An R expression.
- **rerun**: Whether to delete the RDS file, rerun the expression, and save the result again (i.e., invalidate the cache if it exists).
- **file**: The base (see Details) cache filename under the directory specified by the `dir` argument. If not specified and this function is called inside a code chunk of a *knitr* document (e.g., an R Markdown document), the default is the current chunk label plus the extension `.rds`.
- **dir**: The path of the RDS file is partially determined by `paste0(dir, file)`. If not specified and the *knitr* package is available, the default value of `dir` is the *knitr* chunk option `cache.path` (so if you are compiling a *knitr* document, you do not need to provide this `dir` argument explicitly), otherwise the default is `"cache/"`. If you do not want to provide a `dir` but simply a valid path to the `file` argument, you may use `dir = ""`.
- **hash**: A list object that contributes to the MD5 hash of the cache filename (see Details). It can also take a special character value "auto". Other types of objects are ignored.
- **clean**: Whether to clean up the old cache files automatically when `expr` has changed.
- **...**: Other arguments to be passed to `saveRDS()`.

**Details**

Note that the `file` argument does not provide the full cache filename. The actual name of the cache file is of the form `BASENAME_HASH.rds`, where `BASENAME` is the base name provided via the `file` argument (e.g., if `file = 'foo.rds'`, `BASENAME` would be `foo`), and `HASH` is the MD5 hash (also called the 'checksum') calculated from the R code provided to the `expr` argument and the value of the `hash` argument, which means when the code or the `hash` argument changes, the `HASH` string may also change, and the old cache will be invalidated (if it exists). If you want to find the cache file, look for `.rds` files that contain 32 hexadecimal digits (consisting of 0-9 and a-z) at the end of the filename.

The possible ways to invalidate the cache are: 1) change the code in `expr` argument; 2) delete the cache file manually or automatically through the argument `rerun = TRUE`; and 3) change the value of the `hash` argument. The first two ways should be obvious. For the third way, it makes it possible to automatically invalidate the cache based on changes in certain R objects. For example, when you run `cache_rds({ x + y })`, you may want to invalidate the cache to rerun `{ x + y }` when the value of `x` or `y` has been changed, and you can tell `cache_rds()` to do so by `cache_rds({ x + y }, hash = list(x,y))`. The value of the argument `hash` is expected to be a list, but it can also take a special value, "auto", which means `cache_rds(expr)` will try to automatically figure out the global variables in `expr`, return a list of their values, and use this list as the actual value of `hash`. This behavior is most likely to be what you really want: if the code in `expr` uses an external global variable, you may want to invalidate the cache if the value of the global variable has changed. Here a "global variable" means a variable not created locally in `expr`, e.g., for `cache_rds({ x <=1; x + y })`, `x` is a local variable, and `y` is (most likely to be) a global variable, so changes in `y` should invalidate the cache. However, you know your own code the best. If you want to be completely sure when to invalidate the cache, you can always provide a list of objects explicitly rather than relying on `hash = "auto"`. 
By default (the argument `clean = TRUE`), old cache files will be automatically cleaned up. Sometimes you may want to use `clean = FALSE` (set the R global option `options(xfun.cache_rds.clean = FALSE)` if you want `FALSE` to be the default). For example, you may not have decided which version of code to use, and you can keep the cache of both versions with `clean = FALSE`, so when you switch between the two versions of code, it will still be fast to run the code.

**Value**

If the cache file does not exist, run the expression and save the result to the file, otherwise read the cache file and return the value.

**Note**

Changes in the code in the `expr` argument do not necessarily always invalidate the cache, if the changed code is parsed to the same expression as the previous version of the code. For example, if you have run `cache_rds({Sys.sleep(5);1+1})` before, running `cache_rds({ Sys.sleep( 5 ) ; 1 + 1 })` will use the cache, because the two expressions are essentially the same (they only differ in white spaces). Usually you can add/delete white spaces or comments to your code in `expr` without invalidating the cache. See the package vignette `vignette('xfun',package = 'xfun')` for more examples.

When this function is called in a code chunk of a **knitr** document, you may not want to provide the filename or directory of the cache file, because they have reasonable defaults.

Side-effects (such as plots or printed output) will not be cached. The cache only stores the last value of the expression in `expr`.

**Examples**

```r
f = tempfile() # the cache file
compute = function(...) {
  res = xfun::cache_rds(
    Sys.sleep(1)
    1:10
  ), file = f, dir = "", ...)
  res
}
compute() # takes one second
compute() # returns 1:10 immediately
compute() # fast again
compute(rerun = TRUE) # one second to rerun
compute()
file.remove(f)
```

---

**crandalf_check**

Submit check jobs to crandalf
Description

Check the reverse dependencies of a package using the crandalf service: [https://github.com/yihui/crandalf](https://github.com/yihui/crandalf). If the number of reverse dependencies is large, they will be split into batches and pushed to crandalf one by one.

Usage

```r
crandalf_check(pkg, size = 400, jobs = Inf, which = "all")
```

```r
crandalf_results(pkg, repo = NA, limit = 200, wait = 5 * 60)
```

Arguments

- `pkg`: The package name of which the reverse dependencies are to be checked.
- `size`: The number of reverse dependencies to be checked in each job.
- `jobs`: The number of jobs to run in Github Actions (by default, all jobs are submitted, but you can choose to submit the first few jobs).
- `which`: The type of dependencies (see `rev_check()`).
- `repo`: The crandalf repo on Github (of the form `user/repo` such as "yihui/crandalf"). Usually you do not need to specify it, unless you are not calling this function inside the crandalf project, because `gh` should be able to figure out the repo automatically.
- `limit`: The maximum of records for `gh run list` to retrieve. You only need a larger number if the check results are very early in the Github Action history.
- `wait`: Number of seconds to wait if not all jobs have been completed on Github. By default, this function checks the status every 5 minutes until all jobs are completed. Set `wait` to 0 to disable waiting (and throw an error immediately when any jobs are not completed).

Details

Due to the time limit of a single job on Github Actions (6 hours), you will have to split the large number of reverse dependencies into batches and check them sequentially on Github (at most 5 jobs in parallel). The function `crandalf_check()` does this automatically when necessary. It requires the `git` command to be available.

The function `crandalf_results()` fetches check results from Github after all checks are completed, merge the results, and show a full summary of check results. It requires `gh` (Github CLI: [https://cli.github.com/manual/](https://cli.github.com/manual/)) to be installed and you also need to authenticate with your Github account beforehand.
**del_empty_dir**

*Delete an empty directory*

**Description**

Use `list.file()` to check if there are any files or subdirectories under a directory. If not, delete this empty directory.

**Usage**

```r
del_empty_dir(dir)
```

**Arguments**

- `dir`  
  Path to a directory. If `NULL` or the directory does not exist, no action will be performed.

---

**dir_create**

*Create a directory recursively by default*

**Description**

First check if a directory exists. If it does, return `TRUE`, otherwise create it with `dir.create(recursive = TRUE)` by default.

**Usage**

```r
dir_create(x, recursive = TRUE, ...)
```

**Arguments**

- `x`  
  A path name.
- `recursive`  
  Whether to create all directory components in the path.
- `...`  
  Other arguments to be passed to `dir.create()`.

**Value**

A logical value indicating if the directory either exists or is successfully created.
**dir_exists**  
*Test the existence of files and directories*

**Description**

These are wrapper functions of `utils::file_test()` to test the existence of directories and files. Note that `file_exists()` only tests files but not directories, which is the main difference between `file.exists()` in base R. If you use are using the R version 3.2.0 or above, `dir_exists()` is the same as `dir.exists()` in base R.

**Usage**

```r
dir_exists(x)
file_exists(x)
```

**Arguments**

- `x`  
  A vector of paths.

**Value**

A logical vector.

---

**download_file**  
*Try various methods to download a file*

**Description**

Try all possible methods in `download.file()` (e.g., libcurl, curl, wget, and wininet) and see if any method can succeed. The reason to enumerate all methods is that sometimes the default method does not work, e.g., [https://stat.ethz.ch/pipermail/r-devel/2016-June/072852.html](https://stat.ethz.ch/pipermail/r-devel/2016-June/072852.html).

**Usage**

```r
download_file(url, output = url_filename(url), ...)
```

**Arguments**

- `url`  
  The URL of the file.

- `output`  
  Path to the output file. By default, it is determined by `url_filename()`.

- `...`  
  Other arguments to be passed to `download.file()` (except `method`).

**Value**

The integer code `0` for success, or an error if none of the methods work.
**Note**

To allow downloading large files, the timeout option in `options()` will be temporarily set to one hour (3600 seconds) inside this function when this option has the default value of 60 seconds. If you want a different timeout value, you may set it via `options(timeout = N)`, where N is the number of seconds (not 60).

---

**do_once**  
*Perform a task once in an R session*

**Description**

Perform a task once in an R session, e.g., emit a message or warning. Then give users an optional hint on how not to perform this task at all.

**Usage**

```r
do_once(
  task,
  option,
  hint = c("You will not see this message again in this R session.",
            "If you never want to see this message,",
            sprintf("you may set options(%s = FALSE) in your .Rprofile."),
            option)
)
```

**Arguments**

- **task**: Any R code expression to be evaluated once to perform a task, e.g., `warning('Danger!')` or `message('Today is ', Sys.Date())`.
- **option**: An R option name. This name should be as unique as possible in `options()`. After the task has been successfully performed, this option will be set to FALSE in the current R session, to prevent the task from being performed again the next time when `do_once()` is called.
- **hint**: A character vector to provide a hint to users on how not to perform the task or see the message again in the current R session. Set `hint = ""` if you do not want to provide the hint.

**Value**

The value returned by the task, invisibly.

**Examples**

```r
do_once(message("Today's date is ", Sys.Date()), "xfun.date.reminder")
# if you run it again, it will not emit the message again
do_once(message("Today's date is ", Sys.Date()), "xfun.date.reminder")

do_once(
```
Sys.sleep(2)
1 + 1
}, "xfun.task.1plus1")
do_once(
  Sys.sleep(2)
  1 + 1
}, "xfun.task.1plus1")

---

**embed_file**

*Embed a file, multiple files, or directory on an HTML page*

**Description**

For a file, first encode it into base64 data (a character string). Then generate a hyperlink of the form `<a href="base64 data" download="filename">Download filename</a>`. The file can be downloaded when the link is clicked in modern web browsers. For a directory, it will be compressed as a zip archive first, and the zip file is passed to `embed_file()`. For multiple files, they are also compressed to a zip file first.

**Usage**

```r
embed_file(path, name = basename(path), text = paste("Download", name), ...)
embed_dir(path, name = paste0(normalize_path(path), ".zip"), ...)
embed_files(path, name = with_ext(basename(path[1]), ".zip"), ...)
```

**Arguments**

- `path` Path to the file(s) or directory.
- `name` The default filename to use when downloading the file. Note that for `embed_dir()`, only the base name (of the zip filename) will be used.
- `text` The text for the hyperlink.
- `...` For `embed_file()`, additional arguments to be passed to `htmltools::a()` (e.g., `class = 'foo'`). For `embed_dir()` and `embed_files()`, arguments passed to `embed_file()`.

**Details**

These functions can be called in R code chunks in R Markdown documents with HTML output formats. You may embed an arbitrary file or directory in the HTML output file, so that readers of the HTML page can download it from the browser. A common use case is to embed data files for readers to download.

**Value**

An HTML tag `<a>` with the appropriate attributes.
exit_call

Note

Windows users may need to install Rtools to obtain the zip command to use embed_dir() and embed_files().

These functions require R packages mime and htmltools. If you have installed the rmarkdown package, these packages should be available, otherwise you need to install them separately.

Currently Internet Explorer does not support downloading embedded files (https://caniuse.com/#feat=download). Chrome has a 2MB limit on the file size.

Examples

```r
logo = xfun:::R_logo()
link = xfun::embed_file(logo, text = "Download R logo")
link
if (interactive()) htmltools::browsable(link)
```

Arguments

- `fun` A function to be called when the parent function exits.
- `n` The parent frame number. For `n = 1`, `exit_call(fun)` is the same as `on.exit(fun()); n = 2` means adding `on.exit(fun())` in the parent function; `n = 3` means the grandparent, etc.
- `...` Other arguments to be passed to `on.exit()`.

Description

The function `on.exit()` is often used to perform tasks when the current function exits. This `exit_call()` function allows calling a function when a parent function exits (thinking of it as inserting an `on.exit()` call into the parent function).

Usage

```r
exit_call(fun, n = 2, ...)
```

References

This function was inspired by Kevin Ushey: https://yihui.org/en/2017/12/on-exit-parent/
Examples

```r
f = function(x) {
  print(x)
  xfun::exit_call(function() print("The parent function is exiting!"))
}
g = function(y) {
  f(y)
  print("f() has been called!"
}
g("An argument of g()!")
```

---

**file_ext**

*Manipulate filename extensions*

---

**Description**

Functions to obtain (file_ext()), remove (sans_ext()), and change (with_ext()) extensions in filenames.

**Usage**

- `file_ext(x)`
- `sans_ext(x)`
- `with_ext(x, ext)`

**Arguments**

- `x` A character of file paths.
- `ext` A vector of new extensions. It must be either of length 1, or the same length as `x`.

**Details**

file_ext() is similar to tools::file_ext(), and sans_ext() is similar to tools::file_path_sans_ext().

The main differences are that they treat `tar.(gz|bz2|xz)` and `nb.html` as extensions (but functions in the tools package doesn’t allow double extensions by default), and allow characters ~ and # to be present at the end of a filename.

**Value**

A character vector of the same length as `x`. 
Examples

library(xfun)
p = c("abc.doc", "def123.tex", "path/to/foo.Rmd", "backup.ppt-", "pkg.tar.xz")
file_ext(p)
sans_ext(p)
with_ext(p, ".txt")
with_ext(p, c(".ppt", ".sty", ".Rnw", ".doc", ".zip"))
with_ext(p, ".html")

file_string

Read a text file and concatenate the lines by 'n

Description

The source code of this function should be self-explanatory.

Usage

file_string(file)

Arguments

file Path to a text file (should be encoded in UTF-8).

Value

A character string of text lines concatenated by 'n'.

Examples

xfun::file_string(system.file("DESCRIPTION", package = "xfun"))

format_bytes

Format numbers of bytes using a specified unit

Description

Call the S3 method format.object_size() to format numbers of bytes.

Usage

format_bytes(x, units = "auto", ...)

Arguments

x A numeric vector (each element represents a number of bytes).
units, ... Passed to format().
from_root

Value

A character vector.

Examples

```r
xfun::format_bytes(c(1, 1024, 2000, 1e+06, 2e+08))
xfun::format_bytes(c(1, 1024, 2000, 1e+06, 2e+08), units = "KB")
```

Description

Get the relative path of a path in a project relative to the current working directory

First compose an absolute path using the project root directory and the relative path components, i.e., `file.path(root,...)`. Then convert it to a relative path with `relative_path()`, which is relative to the current working directory.

Usage

```r
from_root(..., root = proj_root(), error = TRUE)
```

Arguments

- `...`: A character vector of path components relative to the root directory of the project.
- `root`: The root directory of the project.
- `error`: Whether to signal an error if the path cannot be converted to a relative path.

Details

This function was inspired by `here::here()`, and the major difference is that it returns a relative path by default, which is more portable.

Value

A relative path, or an error when the project root directory cannot be determined or the conversion failed and `error = TRUE`.

Examples

```r
## Not run:
xfun::from_root("data", "mtcars.csv")
## End(Not run)
```
github_releases

Get the tags of Github releases of a repository

Description

Read the HTML source of the release page and parse the tags of the releases.

Usage

github_releases(repo, subpath = "", pattern = "(v[0-9.]+)"")

Arguments

repo
The repository name of the form user/repo, e.g., "yihui/xfun".

subpath
A character string to be appended to the URL of Github releases (i.e., https://github.com/user/repo/releases/). For example, you may use subpath = "latest" to get the tag of the latest release.

pattern
A regular expression to extract the tags from the HTML source. It must contain a group (i.e., must have a pair of parentheses).

Value

A character vector of (GIT) tags.

Examples

xfun::github_releases("yihui/xfun")

grep_sub

Perform replacement with gsub() on elements matched from grep()

Description

This function is a shorthand of gsub(pattern, replacement, grep(pattern, x, value = TRUE)).

Usage

grep_sub(pattern, replacement, x, ...)

Arguments

pattern, replacement, x, ...
Passed to grep() and gsub().
Value
A character vector.

Examples

```r
# find elements that matches 'a[b]+c' and capitalize 'b' with perl regex
xfun::grep_sub("a([b]+)c", "a\U\1c", c("abc", "abbbc", "adde", "123"), perl = TRUE)
```

---

**gsub_file**

*Search and replace strings in files*

Description
These functions provide the "file" version of `gsub()`, i.e., they perform searching and replacement in files via `gsub()`.

Usage

```r
gsub_file(file, ..., rw_error = TRUE)
gsub_files(files, ...)
gsub_dir(..., dir = ".", recursive = TRUE, ext = NULL, mimetype = ".*")
gsub_ext(ext, ..., dir = ".", recursive = TRUE)
```

Arguments

- **file**: Path of a single file.
- **...**: For `gsub_file()`, arguments passed to `gsub()`. For other functions, arguments passed to `gsub_file()`. Note that the argument `x` of `gsub()` is the content of the file.
- **rw_error**: Whether to signal an error if the file cannot be read or written. If FALSE, the file will be ignored (with a warning).
- **files**: A vector of file paths.
- **dir**: Path to a directory (all files under this directory will be replaced).
- **recursive**: Whether to find files recursively under a directory.
- **ext**: A vector of filename extensions (without the leading periods).
- **mimetype**: A regular expression to filter files based on their MIME types, e.g., `^text/` for plain text files. This requires the `mime` package.

Note
These functions perform in-place replacement, i.e., the files will be overwritten. Make sure you backup your files in advance, or use version control!
install_dir

Examples

```r
library(xfun)
f = tempfile()
writeLines(c("hello", "world"), f)
gsub_file(f, "world", "woRld", fixed = TRUE)
readLines(f)
```

install_dir

Install a source package from a directory

Description

Run `R CMD build` to build a tarball from a source directory, and run `R CMD INSTALL` to install it.

Usage

```r
install_dir(pkg, build = TRUE, build_opts = NULL, install_opts = NULL)
```

Arguments

- `pkg` The package source directory.
- `build` Whether to build a tarball from the source directory. If `FALSE`, run `R CMD INSTALL` on the directory directly (note that vignettes will not be automatically built).
- `build_opts` The options for `R CMD build`.
- `install_opts` The options for `R CMD INSTALL`.

Value

Invisible status from `R CMD INSTALL`.

install_github

An alias of `remotes::install_github()`

Description

This alias is to make autocomplete faster via `xfun::install_github`, because most `remotes::install_*` functions are never what I want. I only use `install_github` and it is inconvenient to autocomplete it, e.g. `install_git` always comes before `install_github`, but I never use it. In RStudio, I only need to type `xfun::ig` to get `xfun::install_github`.

Usage

```r
install_github(...)```

Arguments

- `...` Arguments to be passed to `remotes::install_github()`.
### in_dir

**Evaluate an expression under a specified working directory**

**Description**

Change the working directory, evaluate the expression, and restore the working directory.

**Usage**

```
in_dir(dir, expr)
```

**Arguments**

- **dir**  
  Path to a directory.

- **expr**  
  An R expression.

**Examples**

```r
library(xfun)
in_dir(tempdir(), {
  print(getwd())
  list.files()
})
```

---

### isFALSE

**Test if an object is identical to FALSE**

**Description**

A simple abbreviation of `identical(x, FALSE)`.

**Usage**

```
isFALSE(x)
```

**Arguments**

- **x**  
  An R object.

**Examples**

```r
library(xfun)
isFALSE(TRUE)  # false
isFALSE(FALSE)  # true
isFALSE(c(FALSE, FALSE))  # false
```
is_abs_path

Test if paths are relative or absolute

Description
On Unix, check if the paths start with ‘/’ or ‘~’ (if they do, they are absolute paths). On Windows, check if a path remains the same (via xfun::same_path()) if it is prepended with ‘./’ (if it does, it is a relative path).

Usage
is_abs_path(x)
is_rel_path(x)

Arguments
x A vector of paths.

Value
A logical vector.

Examples
xfun::is_abs_path(c("C:/foo", "foo.txt", "/Users/john/", tempdir()))
xfun::is_rel_path(c("C:/foo", "foo.txt", "/Users/john/", tempdir()))

is_ascii

Check if a character vector consists of entirely ASCII characters

Description
Converts the encoding of a character vector to ‘ascii’, and check if the result is NA.

Usage
is_ascii(x)

Arguments
x A character vector.

Value
A logical vector indicating whether each element of the character vector is ASCII.
is_sub_path

Test if a path is a subpath of a dir

Description

Check if the path starts with the dir path.

Usage

`is_sub_path(x, dir, n = nchar(dir))`

Arguments

- `x`: A vector of paths.
- `dir`: A vector of directory paths.
- `n`: The length of `dir` paths.

Value

A logical vector.

Note

You may want to normalize the values of the `x` and `dir` arguments first (with `xfun::normalize_path()`), to make sure the path separators are consistent.

Examples

```r
library(xfun)

is_ascii(letters) # yes
is_ascii(intToUtf8(8212)) # no

xfun::is_sub_path("a/b/c.txt", "a/b") # TRUE
xfun::is_sub_path("a/b/c.txt", "d/b") # FALSE
xfun::is_sub_path("a/b/c.txt", "a\b") # FALSE (even on Windows)
```
is_web_path  

Test if a path is a web path

Description

Check if a path starts with ‘http://’ or ‘https://’ or ‘ftp://’ or ‘ftps://’.

Usage

is_web_path(x)

Arguments

x  A vector of paths.

Value

A logical vector.

Examples

xfun::is_web_path("https://www.r-project.org")  # TRUE
xfun::is_web_path("www.r-project.org")  # FALSE

is_windows  

Test for types of operating systems

Description

Functions based on .Platform$OS.type and Sys.info() to test if the current operating system is Windows, macOS, Unix, or Linux.

Usage

is_windows()

is_unix()

is_macos()

is_linux()
Examples

```r
library(xfun)
# only one of the following statements should be true
is_windows()
is_unix() && is_macos()is_linux()
```

---

**magic_path**

*Find a file or directory under a root directory*

Description

Given a path, try to find it recursively under a root directory. The input path can be an incomplete path, e.g., it can be a base filename, and `magic_path()` will try to find this file under subdirectories.

Usage

```r
magic_path(
  ...,
  root = proj_root(),
  relative = TRUE,
  error = TRUE,
  message = getOption("xfun.magic_path.message", TRUE),
  n_dirs = getOption("xfun.magic_path.n_dirs", 10000)
)
```

Arguments

- `...`: A character vector of path components.
- `root`: The root directory under which to search for the path. If `NULL`, the current working directory is used.
- `relative`: Whether to return a relative path.
- `error`: Whether to signal an error if the path is not found, or multiple paths are found.
- `message`: Whether to emit a message when multiple paths are found and `error = FALSE`.
- `n_dirs`: The number of subdirectories to recursively search. The recursive search may be time-consuming when there are a large number of subdirectories under the root directory. If you really want to search for all subdirectories, you may try `n_dirs = Inf`.

Value

The path found under the root directory, or an error when `error = TRUE` and the path is not found (or multiple paths are found).
Examples

```r
## Not run:
xfun::magic_path("mtcars.csv") # find any file that has the base name mtcars.csv

## End(Not run)
```

---

**mark_dirs**

Mark some paths as directories

**Description**

Add a trailing backlash to a file path if this is a directory. This is useful in messages to the console for example to quickly identify directories from files.

**Usage**

```r
mark_dirs(x)
```

**Arguments**

- `x` Character vector of paths to files and directories.

**Details**

If `x` is a vector of relative paths, directory test is done with path relative to the current working dir. Use `xfun::in_dir()` or use absolute paths.

**Examples**

```r
mark_dirs(list.files(find.package("xfun"), full.names = TRUE))
```

---

**msg_cat**

Generate a message with `cat()`

**Description**

This function is similar to `message()`, and the difference is that `msg_cat()` uses `cat()` to write out the message, which is sent to `stdout` instead of `stderr`. The message can be suppressed by `suppressMessages()`.

**Usage**

```r
msg_cat(...)```
Arguments

... Character strings of messages, which will be concatenated into one string via
paste(c(...),collapse = '')

Value

Invisible NULL, with the side-effect of printing the message.

Note

By default, a newline will not be appended to the message. If you need a newline, you have to
explicitly add it to the message (see ‘Examples’).

See Also

This function was inspired by rlang::inform().

Examples

{
  # a message without a newline at the end
  xfun::msg_cat("Hello world!")
  # add a newline at the end
  xfun::msg_cat(" This message appears right after the previous one.\n")
}
suppressMessages(xfun::msg_cat("Hello world!"))

Description

Apply enc2native() to the character vector, and check if enc2utf8() can convert it back without
a loss. If it does, return enc2native(x), otherwise return the original vector with a warning.

Usage

native_encode(x)

Arguments

x A character vector.

Note

On platforms that supports UTF-8 as the native encoding (l10n_info()["UTF-8"] returns TRUE),
the conversion will be skipped.
**news2md**

*Convert package news to the Markdown format*

**Description**

Read the package news with `news()`, convert the result to Markdown, and write to an output file (e.g., `NEWS.md`). Each package version appears in a first-level header, each category (e.g., `NEW FEATURES` or `BUG FIXES`) is in a second-level header, and the news items are written into bullet lists.

**Usage**

```r
news2md(package, ..., output = "NEWS.md", category = TRUE)
```

**Arguments**

- `package, ...` Arguments to be passed to `news()`.
- `output` The output file path.
- `category` Whether to keep the category names.

**Value**

If `output = NA`, returns the Markdown content as a character vector, otherwise the content is written to the output file.

**Examples**

```r
# news for the current version of R
xfun::news2md("R", Version == getRversion(), output = NA)
```
normalize_path

Normalize paths

Description

A wrapper function of normalizePath() with different defaults.

Usage

normalize_path(x, winslash = "/", must_work = FALSE)

Arguments

x, winslash, must_work

Arguments passed to normalizePath().

Examples

library(xfun)
normalize_path("~")

numbers_to_words

Convert numbers to English words

Description

This can be helpful when writing reports with knitr/rmarkdown if we want to print numbers as English words in the output. The function n2w() is an alias of numbers_to_words().

Usage

numbers_to_words(x, cap = FALSE, hyphen = TRUE, and = FALSE)

n2w(x, cap = FALSE, hyphen = TRUE, and = FALSE)

Arguments

x A numeric vector. Values should be integers. The absolute values should be less than 1e15.
cap Whether to capitalize the first letter of the word. This can be useful when the word is at the beginning of a sentence. Default is FALSE.
hyphen Whether to insert hyphen (-) when the number is between 21 and 99 (except 30, 40, etc.).
and Whether to insert and between hundreds and tens, e.g., write 110 as “one hundred and ten” if TRUE instead of “one hundred ten”.

Value

A character vector.

Author(s)

Daijiang Li

Examples

```r
library(xfun)
n2w(0, cap = TRUE)
n2w(0:121, and = TRUE)
n2w(1e+06)
n2w(1e+11 + 12345678)
n2w(-987654321)
n2w(1e+15 - 1)
```

---

**optipng**

Run OptiPNG on all PNG files under a directory

Description

Call the command `optipng` via `system2()` to optimize all PNG files under a directory.

Usage

```r
optipng(
  dir = ".",
  files = list.files(dir, "[.]png\$", recursive = TRUE, full.names = TRUE),
  ...
)
```

Arguments

- `dir` Path to a directory.
- `files` Alternatively, you can choose the specific files to optimize.
- `...` Arguments to be passed to `system2()`.

References

parse_only  

Parse R code and do not keep the source

Description

An abbreviation of `parse(keep.source = FALSE)`.

Usage

`parse_only(code)`

Arguments

code  
A character vector of the R source code.

Value

R expressions.

Examples

```r
library(xfun)
parse_only("1+1")
parse_only(c("y~x", "1:5 # a comment"))
parse_only(character(0))
```

pkg_attach

Attach or load packages, and automatically install missing packages if requested

Description

`pkg_attach()` is a vectorized version of `library()` over the package argument to attach multiple packages in a single function call. `pkg_load()` is a vectorized version of `requireNamespace()` to load packages (without attaching them). The functions `pkg_attach2()` and `pkg_load2()` are wrappers of `pkg_attach(install = TRUE)` and `pkg_load(install = TRUE)`, respectively. `loadable()` is an abbreviation of `requireNamespace(quietly = TRUE)`. `pkg_available()` tests if a package with a minimal version is available.
pkg_attach

Usage

pkg_attach(
  ..., 
  install = FALSE, 
  message =getOption("xfun.pkg_attach.message", TRUE) 
)

pkg_load(..., error = TRUE, install = FALSE)

loadable(pkg, strict = TRUE, new_session = FALSE)

pkg_available(pkg, version = NULL)

pkg_attach2(...)

pkg_load2(...)

Arguments

... Package names (character vectors, and must always be quoted).
install Whether to automatically install packages that are not available using install.packages(). Besides TRUE and FALSE, the value of this argument can also be a function to install packages (install = TRUE is equivalent to install = install.packages), or a character string "pak" (equivalent to install = pak::pkg_install, which requires the pak package). You are recommended to set a CRAN mirror in the global option repos via options() if you want to automatically install packages.
message Whether to show the package startup messages (if any startup messages are provided in a package).
error Whether to signal an error when certain packages cannot be loaded.
pkg A single package name.
strict If TRUE, use requireNamespace() to test if a package is loadable; otherwise only check if the package is in .packages(TRUE) (this does not really load the package, so it is less rigorous but on the other hand, it can keep the current R session clean).
new_session Whether to test if a package is loadable in a new R session. Note that new_session = TRUE implies strict = TRUE.
version A minimal version number. If NULL, only test if a package is available and do not check its version.

Details

These are convenience functions that aim to solve these common problems: (1) We often need to attach or load multiple packages, and it is tedious to type several library() calls; (2) We are likely to want to install the packages when attaching/loading them but they have not been installed.
Value

pkg_attach() returns NULL invisibly. pkg_load() returns a logical vector, indicating whether the packages can be loaded.

See Also

pkg_attach2() is similar to pacman::p_load(), but does not allow non-standard evaluation (NSE) of the ... argument, i.e., you must pass a real character vector of package names to it, and all names must be quoted. Allowing NSE adds too much complexity with too little gain (the only gain is that it saves your effort in typing two quotes).

Examples

library(xfun)
pkg_attach("stats", "graphics")
# pkg_attach2('servr') # automatically install servr if it is not installed
(pkg_load("stats", "graphics"))

Description

Read a text file with the UTF-8 encoding, apply a function to the text, and write back to the original file.

Usage

process_file(file, fun = identity, x = read_utf8(file))

sort_file(..., fun = sort)

Arguments

file Path to a text file.
fun A function to process the text.
x The content of the file.
... Arguments to be passed to process_file().

Details

sort_file() is an application of process_file(), with the processing function being sort(), i.e., it sorts the text lines in a file and write back the sorted text.
**proc_kill**

**Value**

If file is provided, invisible NULL (the file is updated as a side effect), otherwise the processed content (as a character vector).

**Examples**

```r
f = tempfile()
xfun::write_utf8("Hello World", f)
xfun::process_file(f, function(x) gsub("World", "WoRld", x))
xfun::read_utf8(f) # see if it has been updated
file.remove(f)
```

**Description**

Run the command `taskkill /f /pid` on Windows and `kill` on Unix, respectively, to kill a process.

**Usage**

```r
proc_kill(pid, recursive = TRUE, ...)
```

**Arguments**

- **pid**: The process ID.
- **recursive**: Whether to kill the child processes of the process.
- **...**: Arguments to be passed to `system2()` to run the command to kill the process.

**Value**

The status code returned from `system2()`.

**proj_root**

**Return the (possible) root directory of a project**

**Description**

Given a path of a file (or dir) in a potential project (e.g., an R package or an RStudio project), return the path to the project root directory.

**Usage**

```r
proj_root(path = "/.", rules = root_rules)
```

root_rules
**Arguments**

- `path`: The initial path to start the search. If it is a file path, its parent directory will be used.
- `rules`: A matrix of character strings of two columns: the first column contains regular expressions to look for filenames that match the patterns, and the second column contains regular expressions to match the content of the matched files. The regular expression can be an empty string, meaning that it will match anything.

**Format**

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

**Details**

The search for the root directory is performed by a series of tests, currently including looking for a `DESCRIPTION` file that contains `Package: *` (which usually indicates an R package), and a `*.Rproj` file that contains `Version: *` (which usually indicates an RStudio project). If files with the expected patterns are not found in the initial directory, the search will be performed recursively in upper-level directories.

**Value**

Path to the root directory if found, otherwise `NULL`.

**Note**

This function was inspired by the `rprojroot` package, but is much less sophisticated. It is a rather simple function designed to be used in some of packages that I maintain, and may not meet the need of general users until this note is removed in the future (which should be unlikely). If you are sure that you are working on the types of projects mentioned in the 'Details' section, this function may be helpful to you, otherwise please consider using `rprojroot` instead.

---

**prose_index**

*Find the indices of lines in Markdown that are prose (not code blocks)*

**Description**

Filter out the indices of lines between code block fences such as ``` (could be three or four or more backticks).

**Usage**

`prose_index(x, warn = TRUE)`

**Arguments**

- `x`: A character vector of text in Markdown.
- `warn`: Whether to emit a warning when code fences are not balanced.
**Value**

An integer vector of indices of lines that are prose in Markdown.

**Note**

If the code fences are not balanced (e.g., a starting fence without an ending fence), this function will treat all lines as prose.

**Examples**

```r
library(xfun)
prose_index(c("a", "\````", "b", "\````", "c"))
prose_index(c("a", "\````", "\````r", "1+1", "\````", "\````", "\````", "c"))
```

---

**Description**

For Markdown renderers that do not support LaTeX math, we need to protect math expressions as verbatim code (in a pair of backticks), because some characters in the math expressions may be interpreted as Markdown syntax (e.g., a pair of underscores may make text italic). This function detects math expressions in Markdown (by heuristics), and wrap them in backticks.

**Usage**

```r
protect_math(x)
```

**Arguments**

- `x` A character vector of text in Markdown.

**Details**

Expressions in pairs of dollar signs or double dollar signs are treated as math, if there are no spaces after the starting dollar sign, or before the ending dollar sign. There should be spaces before the starting dollar sign, unless the math expression starts from the very beginning of a line. For a pair of single dollar signs, the ending dollar sign should not be followed by a number. With these assumptions, there should not be too many false positives when detecting math expressions.

Besides, LaTeX environments (`\begin{}` and `\end{}`) are also protected in backticks.

**Value**

A character vector with math expressions in backticks.
Note

If you are using Pandoc or the rmarkdown package, there is no need to use this function, because Pandoc’s Markdown can recognize math expressions.

Examples

library(xfun)
protect_math(c("hi $a+b$", "hello $$\alpha$$", "no math here: $x$ is $10$ dollars"))
protect_math(c("hi $$", \begin{equation}, "x + y = z", \end{equation}"))

---

**raw_string**

Print a character vector in its raw form

Description

The function `raw_string()` assigns the class `xfun_raw_string` to the character vector, and the corresponding printing function `print.xfun_raw_string()` uses `cat(x, sep = '/quotesingle.Var

/quotesingle.Var

/quotesingle.Var

\n')` to write the character vector to the console, which will suppress the leading indices (such as `[1]`) and double quotes, and it may be easier to read the characters in the raw form (especially when there are escape sequences).

Usage

```r
raw_string(x)
```

## S3 method for class 'xfun_raw_string'

```r
print(x, ...)```

Arguments

- `x`: For `raw_string()`, a character vector. For the print method, the `raw_string()` object.
- `...`: Other arguments (currently ignored).

Examples

```r
library(xfun)
raw_string(head(LETTERS))
raw_string(c("a \"b"", "hello\tworld!"))
```
read_bin

Read all records of a binary file as a raw vector by default

Description
This is a wrapper function of `readBin()` with default arguments `what = "raw"` and `n = file.size(file)`, which means it will read the full content of a binary file as a raw vector by default.

Usage
```
read_bin(file, what = "raw", n = file.info(file)$size, ...)
```

Arguments
- `file`, `what`, `n`, `...`
  Arguments to be passed to `readBin()`.

Value
A vector returned from `readBin()`.

Examples
```
f = tempfile()
cat("abc", file = f)
xfun::read_bin(f)
unlink(f)
```

---

read_utf8

Read / write files encoded in UTF-8

Description
Read or write files, assuming they are encoded in UTF-8. `read_utf8()` is roughly `readLines(encoding = 'UTF-8')` (a warning will be issued if non-UTF8 lines are found), and `write_utf8()` calls `writeLines(enc2utf8(text),useBytes = TRUE)`.

Usage
```
read_utf8(con, error = FALSE)
write_utf8(text, con, ...)
append_utf8(text, con, sort = TRUE)
append_unique(text, con, sort = function(x) base::sort(unique(x)))
```
Arguments

- **con**: A connection or a file path.
- **error**: Whether to signal an error when non-UTF8 characters are detected (if FALSE, only a warning message is issued).
- **text**: A character vector (will be converted to UTF-8 via `enc2utf8()`).
- **sort**: Logical (FALSE means not to sort the content) or a function to sort the content; TRUE is equivalent to `base::sort`.

Details

The function `append_utf8()` appends UTF-8 content to a file or connection based on `read_utf8()` and `write_utf8()`, and optionally sort the content. The function `append_unique()` appends unique lines to a file or connection.

---

**relative_path**

*Get the relative path of a path relative to a directory*

Description

Given a directory, return the relative path that is relative to this directory. For example, the path ‘foo/bar.txt’ relative to the directory ‘foo’ is ‘bar.txt’, and the path ‘/a/b/c.txt’ relative to ‘/d/e’ is ‘../../a/b/c.txt’.

Usage

`relative_path(x, dir = ".", use.. = TRUE, error = TRUE)`

Arguments

- **x**: A vector of paths to be converted to relative paths.
- **dir**: Path to a directory.
- **use..**: Whether to use double-dots (‘..’ ) in the relative path. A double-dot indicates the parent directory (starting from the directory provided by the `dir` argument).
- **error**: Whether to signal an error if a path cannot be converted to a relative path.

Value

A vector of relative paths if the conversion succeeded; otherwise the original paths when `error = FALSE`, and an error when `error = TRUE`.

Examples

```r
xfun::relative_path("foo/bar.txt", "foo")
xfun::relative_path("foo/bar/a.txt", "foo/haha")
xfun::relative_path(getwd())
```
rename_seq

Rename files with a sequential numeric prefix

Description

Rename a series of files and add an incremental numeric prefix to the filenames. For example, files ‘a.txt’, ‘b.txt’, and ‘c.txt’ can be renamed to ‘1-a.txt’, ‘2-b.txt’, and ‘3-c.txt’.

Usage

rename_seq(
  pattern = "^[0-9]+-.+[.]Rmd$",
  format = "auto",
  replace = TRUE,
  start = 1,
  dry_run = TRUE
)

Arguments

pattern A regular expression for list.files() to obtain the files to be renamed. For example, to rename .jpeg files, use pattern = "[.]jpeg$".
format The format for the numeric prefix. This is passed to sprintf(). The default format is "%0Nd" where $N = floor(\log_{10}(n)) + 1$ and $n$ is the number of files, which means the prefix may be padded with zeros. For example, if there are 150 files to be renamed, the format will be "%03d" and the prefixes will be 001, 002, ..., 150.
replace Whether to remove existing numeric prefixes in filenames.
start The starting number for the prefix (it can start from 0).
dry_run Whether to not really rename files. To be safe, the default is TRUE. If you have looked at the new filenames and are sure the new names are what you want, you may rerun rename_seq() with dry_run = FALSE to actually rename files.

Value

A named character vector. The names are original filenames, and the vector itself is the new filenames.

Examples

xfun::rename_seq()
xfun::rename_seq("[.]\(jpeg\|png\)$", format = "%04d"")
### retry

**Retry calling a function for a number of times**

**Description**

If the function returns an error, retry it for the specified number of times, with a pause between attempts.

**Usage**

```r
retry(fun, ..., .times = 3, .pause = 5)
```

**Arguments**

- `fun` A function.
- `...` Arguments to be passed to the function.
- `.times` The number of times.
- `.pause` The number of seconds to wait before the next attempt.

**Details**

One application of this function is to download a web resource. Since the download might fail sometimes, you may want to retry it for a few more times.

**Examples**

```r
# read the Github releases info of the repo yihui/xfun
xfun::retry(xfun::github_releases, "yihui/xfun")
```

---

### rev_check

**Run R CMD check on the reverse dependencies of a package**

**Description**

Install the source package, figure out the reverse dependencies on CRAN, download all of their source packages, and run R CMD check on them in parallel.
**Usage**

```r
rev_check(
  pkg,
  which = "all",
  recheck = NULL,
  ignore = NULL,
  update = TRUE,
  timeout = getOption("xfun.rev_check.timeout", 15 * 60),
  src = file.path(src_dir, pkg),
  src_dir = getOption("xfun.rev_check.src_dir")
)
```

`compare_Rcheck(status_only = TRUE, output = "00check_diffs.md")`

**Arguments**

- **pkg**
  - The package name.

- **which**
  - Which types of reverse dependencies to check. See `tools::package_dependencies()` for possible values. The special value 'hard' means the hard dependencies, i.e., `c('Depends', 'Imports', 'LinkingTo')`.

- **recheck**
  - A vector of package names to be (re)checked. If not provided and there are any `*.Rcheck` directories left by certain packages (this often means these packages failed the last time), `recheck` will be these packages; if there are no `*.Rcheck` directories but a text file `recheck` exists, `recheck` will be the character vector read from this file. This provides a way for you to manually specify the packages to be checked. If there are no packages to be rechecked, all reverse dependencies will be checked.

- **ignore**
  - A vector of package names to be ignored in R CMD check. If this argument is missing and a file `00ignore` exists, the file will be read as a character vector and passed to this argument.

- **update**
  - Whether to update all packages before the check.

- **timeout**
  - Timeout in seconds for R CMD check to check each package. The (approximate) total time can be limited by the global option `xfun.rev_check.timeout_total`.

- **src**
  - The path of the source package directory.

- **src_dir**
  - The parent directory of the source package directory. This can be set in a global option if all your source packages are under a common parent directory.

- **status_only**
  - If TRUE, only compare the final statuses of the checks (the last line of `00check.log`), and delete `*.Rcheck` and `*.Rcheck2` if the statuses are identical, otherwise write out the full diffs of the logs. If FALSE, compare the full logs under `*.Rcheck` and `*.Rcheck2`.

- **output**
  - The output Markdown file to which the diffs in check logs will be written. If the `markdown` package is available, the Markdown file will be converted to HTML, so you can see the diffs more clearly.
Details

Everything occurs under the current working directory, and you are recommended to call this function under a designated directory, especially when the number of reverse dependencies is large, because all source packages will be downloaded to this directory, and all ‘*.Rcheck’ directories will be generated under this directory, too.

If a source tarball of the expected version has been downloaded before (under the ‘tarball’ directory), it will not be downloaded again (to save time and bandwidth).

After a package has been checked, the associated ‘*.Rcheck’ directory will be deleted if the check was successful (no warnings or errors or notes), which means if you see a ‘*.Rcheck’ directory, it means the check failed, and you need to take a look at the log files under that directory.

The time to finish the check is recorded for each package. As the check goes on, the total remaining time will be roughly estimated via \( n \times \text{mean}(\text{times}) \), where \( n \) is the number of packages remaining to be checked, and \( \text{times} \) is a vector of elapsed time of packages that have been checked.

If a check on a reverse dependency failed, its ‘*.Rcheck’ directory will be renamed to ‘*.Rcheck2’, and another check will be run against the CRAN version of the package. If the logs of the two checks are the same, it means no new problems were introduced in the package, and you can probably ignore this particular reverse dependency. The function `compare_Rcheck()` can be used to create a summary of all the differences in the check logs under ‘*.Rcheck’ and ‘*.Rcheck2’. This will be done automatically if `options(xfun.rev_check.summary = TRUE)` has been set.

A recommended workflow is to use a special directory to run `rev_check()`, set the global `options xfun.rev_check.src_dir` and `repos` in the R startup (see `?Startup`) profile file .Rprofile under this directory, and (optionally) set `R_LIBS_USER` in `.Renviron` to use a special library path (so that your usual library will not be cluttered). Then run `xfun::rev_check(pkg)` once, investigate and fix the problems or (if you believe it was not your fault) ignore broken packages in the file ‘00ignore’, and run `xfun::rev_check(pkg)` again to recheck the failed packages. Repeat this process until all ‘*.Rcheck’ directories are gone.

As an example, I set `options(repos = c(CRAN = 'https://cran.rstudio.com'), xfun.rev_check.src_dir = '~/Dropbox/repo')` in `.Rprofile`, and `R_LIBS_USER='~/.R-tmp'` in `.Renviron`. Then I can run, for example, `xfun::rev_check('knitr')` repeatedly under a special directory ‘~/Downloads/revcheck’.

Reverse dependencies and their dependencies will be installed to ‘~/R-tmp’, and `knitr` will be installed from ‘~/Dropbox/repo/knitr’.

Value

A named numeric vector with the names being package names of reverse dependencies; 0 indicates check success, 1 indicates failure, and 2 indicates that a package was not checked due to global timeout.

See Also

devtools::revdep_check() is more sophisticated, but currently has a few major issues that affect me: (1) It always deletes the ‘*.Rcheck’ directories (https://github.com/r-lib/devtools/issues/1395), which makes it difficult to know more information about the failures; (2) It does not fully install the source package before checking its reverse dependencies (https://github.com/r-lib/devtools/pull/1397); (3) I feel it is fairly difficult to iterate the check (ignore the successful packages and only check the failed packages); by comparison, `xfun::rev_check()`
only requires you to run a short command repeatedly (failed packages are indicated by the existing ‘*.Rcheck’ directories, and automatically checked again the next time).

xfun::rev_check() borrowed a very nice feature from devtools::revdep_check(): estimating and displaying the remaining time. This is particularly useful for packages with huge numbers of reverse dependencies.

### Rscript

**Run the commands Rscript and R CMD**

#### Description

Wrapper functions to run the commands Rscript and R CMD.

#### Usage

```r
Rscript(args, ...)
Rcmd(args, ...)
```

#### Arguments

- `args` A character vector of command-line arguments.
- `...` Other arguments to be passed to `system2()`.

#### Value

A value returned by `system2()`.

#### Examples

```r
library(xfun)
Rscript(c("-e", "1+1"))
Rcmd(c("build", "--help"))
```

### Rscript_call

**Call a function in a new R session via Rscript()**

#### Description

Save the argument values of a function in a temporary RDS file, open a new R session via `Rscript()`, read the argument values, call the function, and read the returned value back to the current R session.
Usage

\[
\text{Rscript\_call(}
\begin{array}{l}
\text{fun,} \\
\text{args = list()}, \\
\text{options = NULL,} \\
\text{...}, \\
\text{wait = TRUE,} \\
\text{fail = sprintf("Failed to run \'%s\' in a new R session.",} \\
\text{deparse(substitute(fun))[1])}
\end{array}
\]
\]

Arguments

- **fun** A function, or a character string that can be parsed and evaluated to a function.
- **args** A list of argument values.
- **options** A character vector of options to passed to \texttt{Rscript}, e.g., \texttt{--vanilla}.
- **..., wait** Arguments to be passed to \texttt{system2()}.
- **fail** The desired error message when an error occurred in calling the function.

Value

The returned value of the function in the new R session.

Examples

- \texttt{factorial(10)}
  # should return the same value
  xfun::Rscript\_call("factorial", list(10))

- \texttt{factorial, list(10)}
  # the first argument can be either a character string or a function
  xfun::Rscript\_call(factorial, list(10))

- \texttt{factorial, list(10), options = c("--vanilla")}
  # Run Rscript starting a vanilla R session
  xfun::Rscript\_call(factorial, list(10), options = c("--vanilla"))

\smallbreak

\begin{tabular}{ll}
\textbf{rstudio\_type} & \textit{Type a character vector into the RStudio source editor} \\
\end{tabular}

Description

Use the \texttt{rstudioapi} package to insert characters one by one into the RStudio source editor, as if they were typed by a human.

Usage

\texttt{rstudio\_type(x, pause = function() 0.1, mistake = 0, save = 0)}
Arguments

- **x**: A character vector.
- **pause**: A function to return a number in seconds to pause after typing each character.
- **mistake**: The probability of making random mistakes when typing the next character. A random mistake is a random string typed into the editor and deleted immediately.
- **save**: The probability of saving the document after typing each character. Note that if a document is not opened from a file, it will never be saved.

Examples

```r
library(xfun)
if (loadable("rstudioapi") && rstudioapi::isAvailable()) {
  rstudio_type("Hello, RStudio! xfun::rstudio_type() looks pretty cool!",
              pause = function() runif(1, 0, 0.5), mistake = 0.1)
}
```

**same_path**

Test if two paths are the same after they are normalized

Description

Compare two paths after normalizing them with the same separator (/).

Usage

```r
same_path(p1, p2, ...)
```

Arguments

- **p1, p2**: Two vectors of paths.
- **...**: Arguments to be passed to `normalize_path()`.

Examples

```r
library(xfun)
same_path("~/foo", file.path(Sys.getenv("HOME"), "foo"))
```
session_info  

An alternative to sessionInfo() to print session information

Description

This function tweaks the output of sessionInfo(): (1) It adds the RStudio version information if running in the RStudio IDE; (2) It removes the information about matrix products, BLAS, and LAPACK; (3) It removes the names of base R packages; (4) It prints out package versions in a single group, and does not differentiate between loaded and attached packages.

Usage

session_info(packages = NULL, dependencies = TRUE)

Arguments

packages A character vector of package names, of which the versions will be printed. If not specified, it means all loaded and attached packages in the current R session.

dependencies Whether to print out the versions of the recursive dependencies of packages.

Details

It also allows you to only print out the versions of specified packages (via the packages argument) and optionally their recursive dependencies. For these specified packages (if provided), if a function xfun_session_info() exists in a package, it will be called and expected to return a character vector to be appended to the output of session_info(). This provides a mechanism for other packages to inject more information into the session_info output. For example, rmarkdown (>= 1.20.2) has a function xfun_session_info() that returns the version of Pandoc, which can be very useful information for diagnostics.

Value

A character vector of the session information marked as raw_string().

Examples

xfun::session_info()
if (xfun::loadable("MASS")) xfun::session_info("MASS")
**set_envvar**  
Set environment variables

**Description**  
Set environment variables from a named character vector, and return the old values of the variables, so they could be restored later.

**Usage**  
```r  
set_envvar(vars)  
```

**Arguments**  
- `vars`  
  A named character vector of the form `c(VARIABLE = VALUE)`. If any value is NA, this function will try to unset the variable.

**Details**  
The motivation of this function is that `Sys.setenv()` does not return the old values of the environment variables, so it is not straightforward to restore the variables later.

**Value**  
Old values of the variables (if not set, NA).

**Examples**  
```r  
vars = xfun::set_envvar(c(FOO = "1234"))  
Sys.getenv("FOO")  
xfun::set_envvar(vars)  
Sys.getenv("FOO")  
```

---

**split_lines**  
Split a character vector by line breaks

**Description**  
Call `unlist(strsplit(x, '\n'))` on the character vector `x` and make sure it works in a few edge cases: `split_lines('')` returns '' instead of character(0) (which is the returned value of `strsplit('','\n')`); `split_lines('a\n')` returns `c('a', '')` instead of `c('a')` (which is the returned value of `strsplit('a\n','\n')`).

**Usage**  
```r  
split_lines(x)  
```
split_source

Arguments

x A character vector.

Value

All elements of the character vector are split by \n into lines.

Examples

xfun::split_lines(c("a", "b\nc"))

split_source  Split source lines into complete expressions

Description

Parse the lines of code one by one to find complete expressions in the code, and put them in a list.

Usage

split_source(x)

Arguments

x A character vector of R source code.

Value

A list of character vectors, and each vector contains a complete R expression.

Examples

xfun::split_source(c("if (TRUE) {", "1 + 1", "})", "print(1:5)"))
**strict_list**

**Strict lists**

**Description**

A strict list is essentially a normal `list()` but it does not allow partial matching with `$`.

**Usage**

```r
strict_list(...) 
as_strict_list(x) 
```

```r
### S3 method for class 'xfun_strict_list'
x$name 
```

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

**Arguments**

- `...` Objects (list elements), possibly named. Ignored in the `print()` method.
- `x` For `as_strict_list()`, the object to be coerced to a strict list. For `print()`, a strict list.
- `name` The name (a character string) of the list element.

**Details**

To me, partial matching is often more annoying and surprising than convenient. It can lead to bugs that are very hard to discover, and I have been bitten by it many times. When I write `x$name`, I always mean precisely `name`. You should use a modern code editor to autocomplete the name if it is too long to type, instead of using partial names.

**Value**

Both `strict_list()` and `as_strict_list()` return a list with the class `xfun_strict_list`. Whereas `as_strict_list()` attempts to coerce its argument `x` to a list if necessary, `strict_list()` just wraps its argument `...` in a list, i.e., it will add another list level regardless if `...` already is of type list.

**Examples**

```r
library(xfun)
(z = strict_list(aaa = "I am aaa", b = 1:5))
z$a # NULL!
z$aaa # I am aaa
z$b
```
$c = "create a new element"

z2 = unclass(z) # a normal list
z2$a # partial matching

z3 = as_strict_list(z2) # a strict list again
z3$a # NULL again!

---

**stringsAsStrings**

Set the global option `options(stringsAsFactors = FALSE)` inside a parent function and restore the option after the parent function exits

---

**Description**

This is a shorthand of `opts = options(stringsAsFactors = FALSE); on.exit(options(opts), add = TRUE); strings_please()` is an alias of `stringsAsStrings()`.

**Usage**

`stringsAsStrings()`

`strings_please()`

**Examples**

```r
f = function() {
  xfun::strings_please()
  data.frame(x = letters[1:4], y = factor(letters[1:4]))
}
str(f()) # the first column should be character
```

---

**submit_cran**

Submit a source package to CRAN

---

**Description**

Build a source package and submit it to CRAN with the `curl` package.

**Usage**

`submit_cran(file = pkg_build(), comment = "")`
Arguments

- **file**: The path to the source package tarball. By default, the current working directory is treated as the package root directory, and automatically built into a tarball, which is deleted after submission. This means you should run `xfun::submit_cran()` in the root directory of a package project, unless you want to pass a path explicitly to the file argument.

- **comment**: Submission comments for CRAN. By default, if a file `cran-comments.md` exists, its content will be read and used as the comment.

See Also

- `devtools::submit_cran()` does the same job, with a few more dependencies in addition to `curl` (such as `cli`); `xfun::submit_cran()` only depends on `curl`.

---

**Description**

Compress PNG/JPEG images with `api.tinify.com`, and download the compressed images. This function requires R packages `curl` and `jsonlite`.

**Usage**

```r
tinify(
  input,
  output,
  quiet = FALSE,
  force = FALSE,
  key = getOption("xfun.tinify.key", Sys.getenv("R_XFUN_TINIFY_KEY")),
  history = getOption("xfun.tinify.history", Sys.getenv("R_XFUN_TINIFY_HISTORY"))
)
```

**Arguments**

- **input**: A vector of input paths of images.
- **output**: A vector of output paths or a function that takes `input` and returns a vector of output paths (e.g., `output = identity` means `output = input`). By default, if the `history` argument is not a provided, `output` is input with a suffix `-min` (e.g., when `input = 'foo.png'`, `output = 'foo-min.png'`), otherwise output is the same as input, which means the original image files will be overwritten.
- **quiet**: Whether to suppress detailed information about the compression, which is of the form `input.png (10 Kb) ==> output.png (5 Kb, 50%); compression count: 42`. The percentage after `output.png` stands for the compression ratio, and the compression count shows the number of compressions used for the current month.
force  Whether to compress an image again when it appears to have been compressed before. This argument only makes sense when the history argument is provided.

key  The Tinify API key. It can be set via either the global option xfun::tinify.key (you may set it in ‘~/.Rprofile’) or the environment variable R_XFUN_TINIFY_KEY (you may set it in ‘~/.Renviron’).

history  Path to a history file to record the MD5 checksum of compressed images. If the checksum of an expected output image exists in this file and force = FALSE, the compression will be skipped. This can help you avoid unnecessary API calls.

Details

You are recommended to set the API key in ‘.Rprofile’ or ‘.Renviron’. After that, the only required argument of this function is input. If the original images can be overwritten by the compressed images, you may either use output = identity, or set the value of the history argument in ‘.Rprofile’ or ‘.Renviron’.

Value

The output file paths.

References

Tinify API: https://tinypng.com/developers.

See Also

The tinieR package (https://github.com/jmablog/tinieR/) is a more comprehensive implementation of the Tinify API, whereas xfun::tinify() has only implemented the feature of shrinking images.

Examples

```r
f = file.path(R.home("doc"), "html", "logo.jpg")
xfun::tinify(f)  # remember to set the API key before trying this
```

---

**tojson**

*A simple JSON serializer*

**Description**

A JSON serializer that only works on a limited types of R data (NULL, lists, logical scalars, character/numeric vectors). A character string of the class JS_EVAL is treated as raw JavaScript, so will not be quoted. The function json_vector() converts an atomic R vector to JSON.
**Usage**

```
tojson(x)
```

```
json_vector(x, to_array = FALSE, quote = TRUE)
```

**Arguments**

- `x` An R object.
- `to_array` Whether to convert a vector to a JSON array (use `[]`).
- `quote` Whether to double quote the elements.

**Value**

A character string.

**See Also**

The `jsonlite` package provides a full JSON serializer.

**Examples**

```r
library(xfun)
tojson(NULL)
tojson(1:10)
tojson(TRUE)
tojson(FALSE)
cat(tojson(list(a = 1, b = list(c = 1:3, d = "abc"))))
cat(tojson(list(c("a", "b"), 1:5, TRUE)))
```

```r
# the class JS_EVAL is originally from htmlwidgets::JS()
JS = function(x) structure(x, class = "JS_EVAL")
cat(tojson(list(a = 1:5, b = JS("function() {return true;}"))))
```

---

**tree**

*Turn the output of `str()` into a tree diagram*

**Description**

The super useful function `str()` uses `.` to indicate the level of sub-elements of an object, which may be difficult to read. This function uses vertical pipes to connect all sub-elements on the same level, so it is clearer which elements belong to the same parent element in an object with a nested structure (such as a nested list).

**Usage**

```
tree(...)```

try_error

Arguments

... Arguments to be passed to `str()` (note that the `comp.str` is hardcoded inside this function, and it is the only argument that you cannot customize).

Value

A character string as a `raw_string()`.

Examples

```r
fit = lsfit(1:9, 1:9)
str(fit)
xfun::tree(fit)

fit = lm(dist ~ speed, data = cars)
str(fit)
xfun::tree(fit)

# some trivial examples
xfun::tree(1:10)
xfun::tree(iris)
```

try_error

Try an expression and see if it throws an error

Description

Use `tryCatch()` to check if an expression throws an error.

Usage

`try_error(expr)`

Arguments

`expr` An R expression.

Value

TRUE (error) or FALSE (success).

Examples

```r
xfun::try_error(stop("foo"))  # TRUE
xfun::try_error(1:10)         # FALSE
```
try_silent

Try to evaluate an expression silently

Description

An abbreviation of `try(silent = TRUE)`.

Usage

`try_silent(expr)`

Arguments

- `expr`: An R expression.

Examples

```r
library(xfun)
z = try_silent(stop("Wrong!"))
inherits(z, "try-error")
```

upload_ftp

Upload to an FTP server via curl

Description

The function `upload_ftp()` runs the command `curl -T file server` to upload a file to an FTP server if the system command `curl` is available, otherwise it uses the R package `curl`. The function `upload_win_builder()` uses `upload_ftp()` to upload packages to the win-builder server.

Usage

```r
upload_ftp(file, server, dir = "")

upload_win_builder(
    file = pkg_build(),
    version = c("R-devel", "R-release", "R-oldrelease"),
    server = c("ftp", "https"),
    solaris = pkg_available("rhub")
)
```
Arguments

file Path to a local file.
server The address of the FTP server. For `upload_win_builder()`, `server = 'https'` means uploading to 'https://win-builder.r-project.org/upload.aspx'.
dir The remote directory to which the file should be uploaded.
version The R version(s) on win-builder.
solaris Whether to also upload the package to the Rhub server to check it on Solaris.

Details

These functions were written mainly to save package developers the trouble of going to the win-builder web page and uploading packages there manually.

Value

Status code returned from `system2()` or `curl::curl_fetch_memory()`.

url_accessible Test if a URL is accessible

Description

Try to send a HEAD request to a URL if `curl` is available, otherwise try to download the URL via `xfun::download_file()`, and see if it succeeds.

Usage

```r
url_accessible(x, use_curl = loadable("curl"))
```

Arguments

x A URL as a character string.
use_curl Whether to use the `curl` package.

Value

TRUE or FALSE.

Examples

```r
xfun::url_accessible("https://yihui.org")
```
url_filename

Extract filenames from a URLs

Description
Get the base names of URLs via basename(), and remove the possible query parameters or hash from the names.

Usage
url_filename(x)

Arguments
x A character vector of URLs.

Value
A character vector of filenames at the end of URLs.

Examples
xfun::url_filename("https://yihui.org/images/logo.png")
xfun::url_filename("https://yihui.org/index.html")
xfun::url_filename("https://yihui.org/index.html?foo=bar")
xfun::url_filename("https://yihui.org/index.html#about")

valid_syntax
Check if the syntax of the code is valid

Description
Try to parse() the code and see if an error occurs.

Usage
valid_syntax(code, silent = TRUE)

Arguments
code A character vector of R source code.
silent Whether to suppress the error message when the code is not valid.

Value
TRUE if the code could be parsed, otherwise FALSE.
Examples

xfun::valid_syntax("1+1")
xfun::valid_syntax("1+")
xfun::valid_syntax(c("if(T){1+1}", "else {2+2}"), silent = FALSE)
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