Package 'cargo'

July 17, 2023

Title Develop R Packages using Rust

Version 0.4.9

Description A framework is provided to develop R packages using 'Rust' <https://www.rust-lang.org/> with minimal overhead, and more wrappers are easily added. Help is provided to use 'Cargo' <https://doc.rust-lang.org/cargo/> in a manner consistent with CRAN policies. 'Rust' code can also be embedded directly in an R script. The package is not official, affiliated with, nor endorsed by the Rust project.

URL https://github.com/dbdahl/cargo-framework (repository)

BugReports https://github.com/dbdahl/cargo-framework/issues

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Depends R (>= 4.2.0)

Suggests roxygen2 (>= 7.2.3)

Encoding UTF-8

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R topics documented:

`api_documentation` *Browse API Documentation*

Description

This function opens in a web browser the documentation of the Rust API.

Usage

```
api_documentation()
```

Value

`NULL`, invisibly.

`authors` *Identify Authorship of Rust Crates*

Description

Since depending crates are vendored by the `build_for_cran` function, the authorship and copyright must be declared in the `DESCRIPTION` file prior to building the source package for The Comprehensive R Archive Network (CRAN). This function helps to identify these attributions but is not guaranteed to the exhaustive, so manual inspection in warranted before submitting to CRAN.

Usage

```
authors()
```

Value

`NULL`, invisibly.

build_for_cran *Build a Source Package for Submission to CRAN*

Description

This function builds a source package in preparation for submission to The Comprehensive R Archive Network (CRAN). and saved it in the root of a package. In particular, Rust crates upon which the package depends are "vendored" within the source package in the archive file `src/rust/vendor.tar.xz`, so that lacking internet access will not give a check warning nor error on CRAN. The package's `configure` script tests for the existence of this archive file and, when present, runs Cargo (Rust's package manager) in compliance with the CRAN Repository Policies in that Cargo will only use two CPU cores and will clean-up cached values (i.e., remove detritus).

Usage

```
build_for_cran(...)
```

Arguments

`...`	Options passed to `R CMD build`.

Details

Since depending crates are vendored, the authorship and copyright must be declared in the `DESCRIPTION` file prior to building the source package for CRAN. See the `authors` function for help in attribution.

This function will rebuild **roxygen2** documentation if the DESCRIPTION file indicates that **roxygen2** is used and the package is installed.

This function does not test the package. The developer is strongly encouraged to both inspect and test the package before submitting to CRAN.

Value

The exit status codeR CMD build, invisibly.

install *Install Rust Toolchain*

Description

This function downloads the '`rustup`' installer, run it, and adds targets to compile for all the CRAN build machines.

Usage

```
install(force = FALSE)
```

Arguments

force	If TRUE, installation proceeds without asking for user confirmation.

Value

Invisibly, TRUE if successful and FALSE otherwise.

---

new_package *Make a Skeleton for a New Package*

Description

A new Rust-based package is created at the supplied path and the package is installed.

Usage

```
new_package(path)
```

Arguments

path	A path where the package is created. The name of the package is taken as the last element in the file path.

---

run *Run Cargo*

Description

This function runs Cargo (Rust's package manager) with the ... arguments passed as command line arguments.

Usage

```
run(
  ...,
  minimum_version = ".",
  search_methods = c("cache", "convention", "path"),
  leave_no_trace = FALSE,
  environment_variables = list(),
  rustflags = NULL,
  verbose = TRUE,
  run_twice = FALSE,
  stdout = "",
  stderr = ""
)
```

Arguments

`...`	Character vector of command line arguments passed to the `cargo` command.
`minimum_version`	A character string representing the minimum version of Rust that is needed. Or a path to the root of a package (i.e., the directory containing the DESCRIPTION file), in which case the value is found from the field: `SystemRequirements: Cargo (>= XXXX)`. For the `search_methods` being `"cache"`, the shell command `rustup` is used to upgrade the Cargo installation if needed.
`search_methods`	A character vector potentially containing values `"path"`, `"convention"`, and `"cache"`. This indicates the methods to use (and their order) when searching for a suitable Cargo installation. `"path"` indicates to try to use `base::Sys.which()`. `"convention"` indicates to try to use the directories `.cargo` in the user's home directory. `"cache"` indicates to try to use the directory from the cargo package's own installation as given by the `tools::R_user_dir('cargo', 'cache')`.
`leave_no_trace`	If `TRUE`, the `CARGO_HOME` environment variable is set to a temporary directory that is subsequently deleted.
`environment_variables`	A named character vector providing environment variables which should be temporarily set while running Cargo. Note that the `CARGO_HOME` and `RUSTUP_HOME` environment variables are automatically set when using the `"cache"` search method. Also, the `CARGO_HOME` environment variable is also set when `leave_no_trace == TRUE`.
`rustflags`	A character vector from which the `CARGO_ENCODED_RUSTFLAGS` environment variables is constructed and then temporarily set. Or, if `NULL`, this environment variable is left unchanged.
`verbose`	If `TRUE`, details of the search for Cargo are shown. If `FALSE`, no details are shown. If it is a connection, then details are shown and also written to the connection.
`run_twice`	Should the cargo command be run twice? The environment variable `R_CARGO_RUN_COUNTER` is set to either `1` or `2` during each run.
`stdout`	See argument of the same name in `base::system2()`.
`stderr`	See argument of the same name in `base::system2()`.

Value

The same value and behavior as the `base::system2()` function, except a non-zero exit code will be given in Cargo is not found.

Examples

```
if (run("--version") != 0) {
  message("Cargo is not installed. Please run cargo::install() in an interactive session.")
}
```

rust_fn *Define an R Function Implemented in Rust*

Description

This function takes Rust code as a string from the last unnamed argument, takes variable names for all other unnamed arguments, compiles the Rust function, and wraps it as an R function.

Usage

```
rust_fn(
  ...,
  dependencies = character(0),
  minimum_version = "1.31.0",
  verbose = FALSE,
  cached = TRUE,
  longjmp = TRUE,
  invisible = FALSE,
  force = FALSE
)
```

Arguments

`...`	Rust code is taken as a string from the last unnamed argument, and variable names come for all other unnamed arguments. See example.
`dependencies`	A character vector of crate dependencies, e.g., `c('rand = "0.8.5"','rand_pcg = "0.3.1"')`.
`minimum_version`	A character string representing the minimum version of Rust that is needed. Or a path to the root of a package (i.e., the directory containing the DESCRIPTION file), in which case the value is found from the field: `SystemRequirements: Cargo (>= XXXX)`. For the `search_methods` being `"cache"`, the shell command `rustup` is used to upgrade the Cargo installation if needed.
`verbose`	If `TRUE`, Cargo prints compilation details. If `FALSE`, Cargo is run in quiet mode, except for the first time this function is run. If `"never"`, Cargo is always run in quiet mode. In any case, errors in code are always shown.
`cached`	Should Cargo use previously compiled artifacts?
`longjmp`	Should the compiled function use the faster (but experimental) longjmp functionality when Rust code panics?
`invisible`	Should the compiled function return values invisibly?
`force`	If `TRUE`, write to cache directory on first usage without asking for user confirmation.

Value

An R function implemented with the supplied Rust code.

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