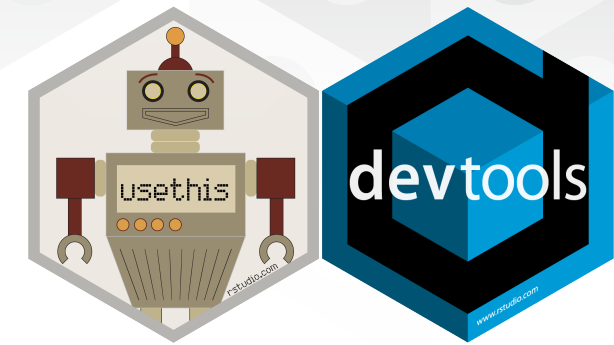
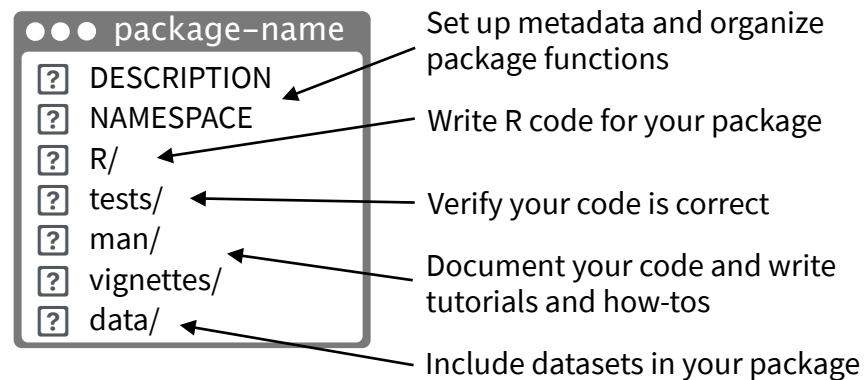


# Package Development :: CHEAT SHEET



## Package Structure

A package is a convention for organizing files into directories. This cheat sheet shows how to work with the 7 most common parts of an R package:



There are multiple packages useful to package development, including **usethis** which handily automates many of the more repetitive tasks. Load and install **devtools** which wraps together several of these packages to access everything in one step.

## Getting Started

Once per machine:

- Get set up with **use\_r\_profile()**

```
if (interactive()) {  
  require("devtools", quietly = TRUE)  
  # automatically attaches usethis  
}
```

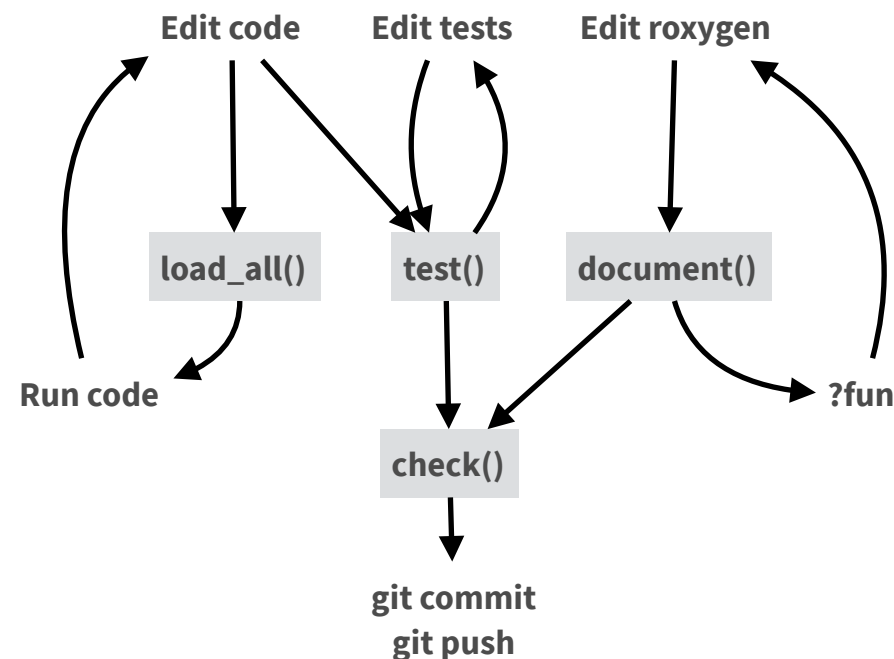
- **create\_github\_token()** — Set up GitHub credentials
- **git\_vaccinate()** — Ignores common special files

Once per package:

- **use\_git()** — Activate git
- **use\_github()** — Connect to GitHub
- **use\_github\_actions()** — Set up automated checks

Having problems with git? Get a situation report with **git\_sitrep()**.

## Workflow



- **load\_all()** (Ctrl/Cmd + Shift + L) — Load code
- **document()** (Ctrl/Cmd + Shift + D) — Rebuild docs and NAMESPACE
- **test()** (Ctrl/Cmd + Shift + T) — Run tests
- **check()** (Ctrl/Cmd + Shift + E) — Check complete package

## R/

All of the R code in your package goes in **R/**. A package with just an **R/** directory is still a very useful package.

- ✓ Create a new package project with **create\_package("path/to/name")**.
- ✓ Create R files with **use\_r("file-name")**.

- Follow the tidyverse style guide at **style.tidyverse.org**
- Click on a function and press **F2** to open its definition
- Find a function or file with **Ctrl + .**

## DESCRIPTION

The **DESCRIPTION** file describes your work, sets up how your package will work with other packages, and applies a license.

- ✓ Pick a license with **use\_mit\_license()**, **use\_gpl3\_license()**, **use\_proprietary\_license()**.
- ✓ Add packages that you need with **use\_package()**.

**Import** packages users of your packages need. R will install them when it installs your package.

**Suggest** packages that developers of your package need. Users can install or not, as they like.

## NAMESPACE

The **NAMESPACE** file helps you make your package self-contained: it won't interfere with other packages, and other packages won't interfere with it.

- ✓ Export functions for users by placing **@export** in their roxygen comments.
- ✓ Access objects from other packages with **package::object** or **@importFrom package object** (recommended) or **@import package** (use with caution).
- ✓ Call **document()** to generate **NAMESPACE** and **load\_all()** to reload.

DESCRIPTION	NAMESPACE
Makes <b>packages</b> available	Makes <b>function</b> available
Mandatory	Optional (can use <b>::</b> instead)
<b>use_package()</b>	<b>use_import_from()</b>

## ? man/

The documentation will become the help pages in your package.

- ✓ Document each function with a roxygen block above its definition. In RStudio, Code > Insert Roxygen Skeleton helps.
- ✓ Document each dataset with roxygen block above the name of the dataset in quotes.
- ✓ Document the package with `use_package_doc()`.

## ? vignettes/

- ✓ Create a vignette that is included with your package with `use_vignette()`.
- ✓ Create an article that only appears on the website with `use_article()`.
- ✓ Write the body of your vignettes in R Markdown.

## Websites with pkgdown



- ✓ Use GitHub and `use_pkgdown_github_pages()` to set up pkgdown and configures an automated workflow using GitHub Actions and Pages.
- ✓ If you're not using GitHub, call `use_pkgdown()` to configure pkgdown. Then build locally with `pkgdown::build_site()`.

## ? tests/



- ✓ Create a test file with `use_test()`.
- ✓ Write tests with `test_that()` and `expect_()`.
- ✓ Run all tests with `test()` and run tests for current file with `test_active_file()`.
- ✓ See coverage of all files with `test_coverage()` and see coverage of current file with `test_coverage_active_file()`.

## ROXYGEN2



The **roxygen2** package lets you write documentation inline in your .R files with shorthand syntax.

- Add roxygen documentation as comments beginning with `#'`.
- Place a roxygen `@` tag (right) after `#'` to supply a specific section of documentation.
- Untagged paragraphs will be used to generate a title, description, and details section (in that order).

```
#' Add together two numbers
#'
#' @param x A number.
#' @param y A number.
#' @returns The sum of `x` and `y`.
#' @export
#' @examples
#' add(1, 1)
add <- function(x, y) {
  x + y
}
```

### COMMON ROXYGEN TAGS

@description	@family	@returns
@examples	@inheritParams	@seealso
@examplesif	@param	
@export	@rdname	

## ? README.Rmd + NEWS.md

- ✓ Create a README and NEWS markdown files with `use_readme_rmd()` and `use_news_md()`.

### Expect statement

### Tests

<code>expect_equal()</code>	Is equal? (within numerical tolerance)
<code>expect_error()</code>	Throws specified error?
<code>expect_snapshot()</code>	Output is unchanged?

```
test_that("Math works", {
  expect_equal(1 + 1, 2)
  expect_equal(1 + 2, 3)
  expect_equal(1 + 3, 4)
})
```

## ? data/

- ✓ Record how a data set was prepared as an R script and save that script to `? data-raw/` with `use_data_raw()`.
- ✓ Save a prepared data object to `? data/` with `use_data()`.

## Package States

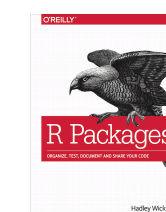
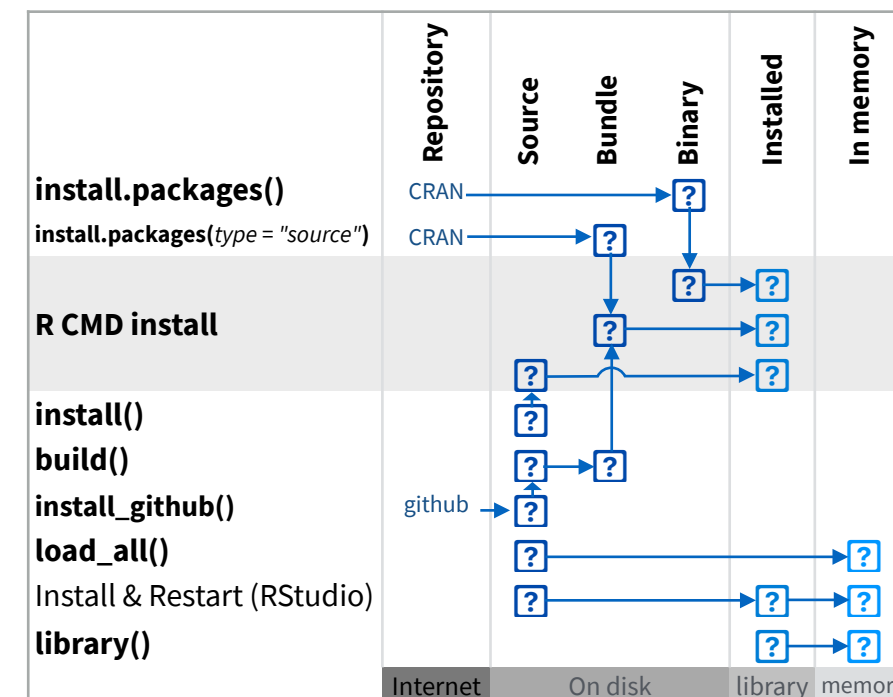
The contents of a package can be stored on disk as a:

- **source** - a directory with sub-directories (as shown in Package structure)
- **bundle** - a single compressed file (.tar.gz)
- **binary** - a single compressed file optimized for a specific OS

Packages exist in those states locally or remotely, e.g. on CRAN or on GitHub.

From those states, a package can be installed into an R library and then loaded into memory during an R session.

Use the functions below to move between these states.



Visit [r-pkgs.org](https://r-pkgs.org) to learn much more about writing and publishing packages for R.