Fundamentals of Package Development

Andy Teucher, Aug 3 2023, Camosun College

Housekeeping

- Bathrooms
- WIFI:
  - Network: Camosun Guest
- Sticky Notes
- Etherpad: https://tinyurl.com/ynn5f6yy
  - (https://etherpad.wikimedia.org/p/2023-08-03-r-pkg-dev)

Welcome!

This is a one-day course for people looking to learn how to build R packages in an efficient way, make them easy to maintain, and easy for users to use.

- Introductions
  - Instructor and TAs - Sam Albers, Stephanie Hazlitt
  - Yourselves
- Code of Conduct:
  - https://github.com/ateucher/pkg-dev-workshop/blob/main/CODE_OF_CONDUCT.md
  - 💙 Treat everyone with respect
  - 🧡 Everyone should feel welcome

Schedule and Learning Objectives

- What is a package and why should you make one?
- Package Structure and State - where do they come from, where do they live?

- Package Creation and Metadata

BREAK: 10:30 - 10:45

- Documentation

- Testing

LUNCH: 12:15 - 1:15

- Package Dependencies

- Continuous Integration

BREAK: 2:45 - 3:00

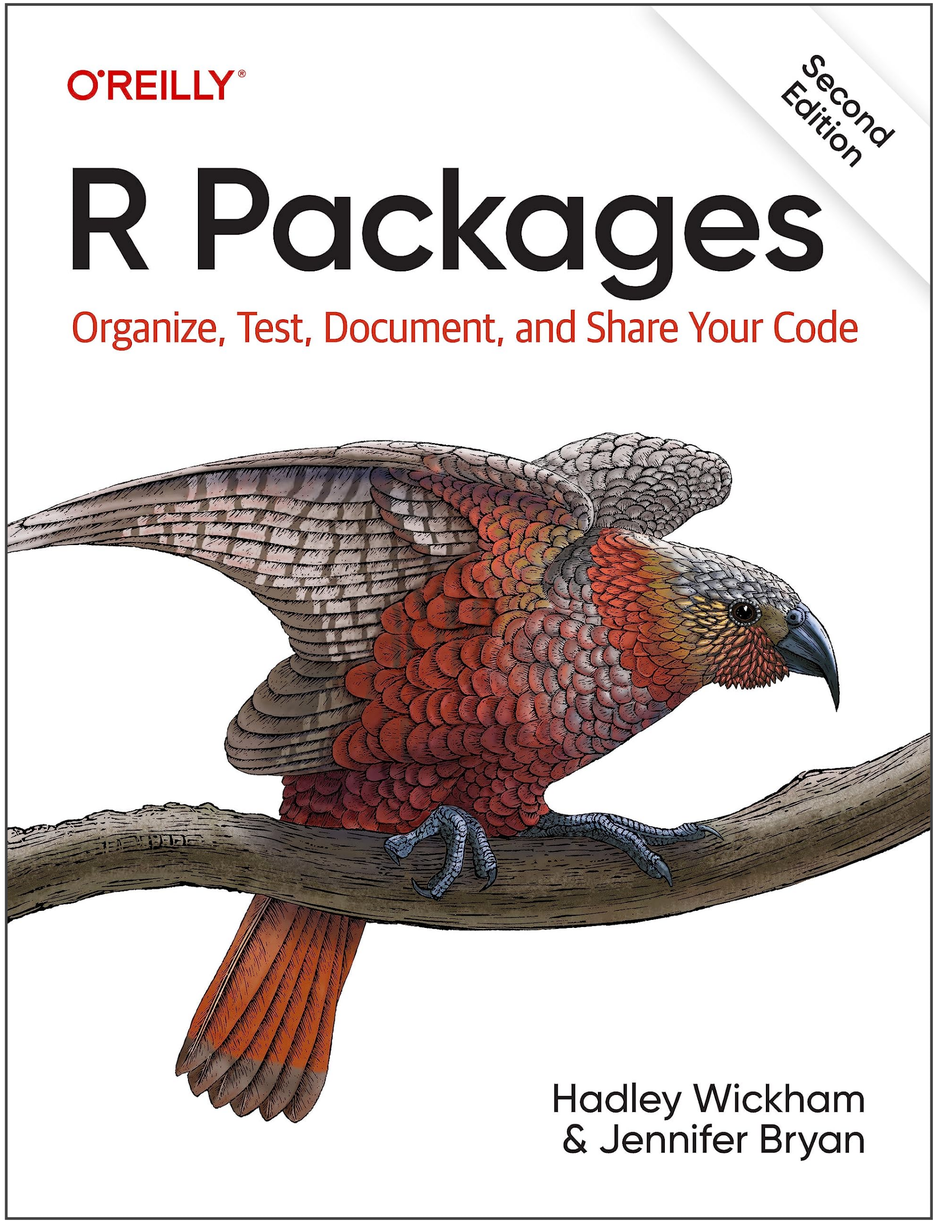
- Package Website & Vignettes
- Package Distribution (CRAN)

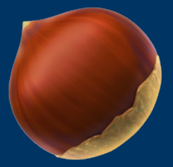
END: 4:30

R Packages (2e)

Hadley Wickham
Jenny Bryan

https://r-pkgs.org



Packages in a nutshell 

Why make a package?

- Easier to reuse functions you write
- A consistent framework which encourages you to better organise, document, and test your code
- using this consistent framework means you can use many standardized tools
- is the easiest way to distribute code and data

Script vs Package

https://r-pkgs.org/package-within.html

Script

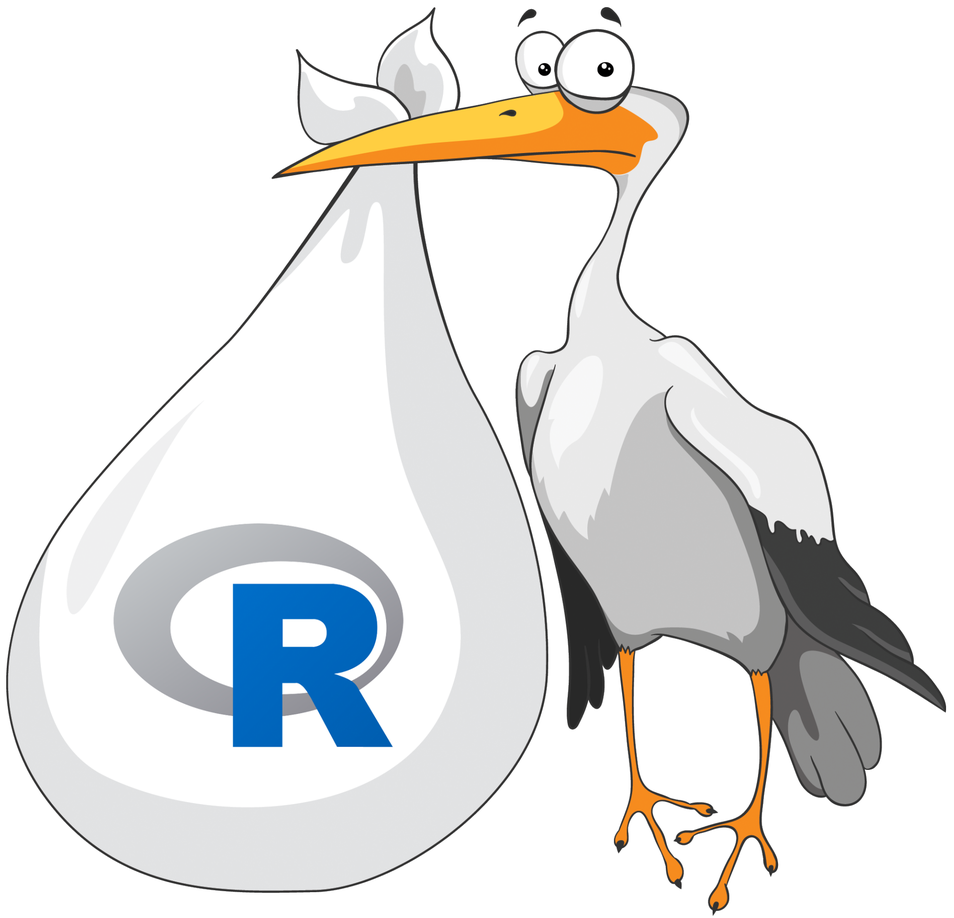
- Performs data analysis
- Collection of one or more `.R` files
- `library()` calls
- Documentation in `# comments`
- Run with `source()` or select+run

Package

- Reusable functions to use in analyses
- Defined by particular file organization
- Required packages in `DESCRIPTION`
- Documentation in `Roxygen` comments and “man” files
- Functions available when package attached

Where do packages come from?

- Discuss with your neighbour and put up a green sticky when you have:
  - Your favourite package
  - 2 **places** from where you install packages
  - 2 **functions** you can use to install packages
- Write them in the etherpad



R Libraries - where do packages live?

- A **library** is a directory containing installed **packages**
- You have at least one library on your computer
- Common (and recommended) to have two libraries:
    1. A **system** library with **`base`** (14) and **`recommended`** (15) packages; installed with R.
    2. A **user** library with user-installed packages
- We use `library(pkg)` function to **attach** a package
- 7 base packages are always attached (`base, methods, utils, stats, grDevices, datasets, graphics`)

Your turn

Type `.libPaths()` to see your libraries

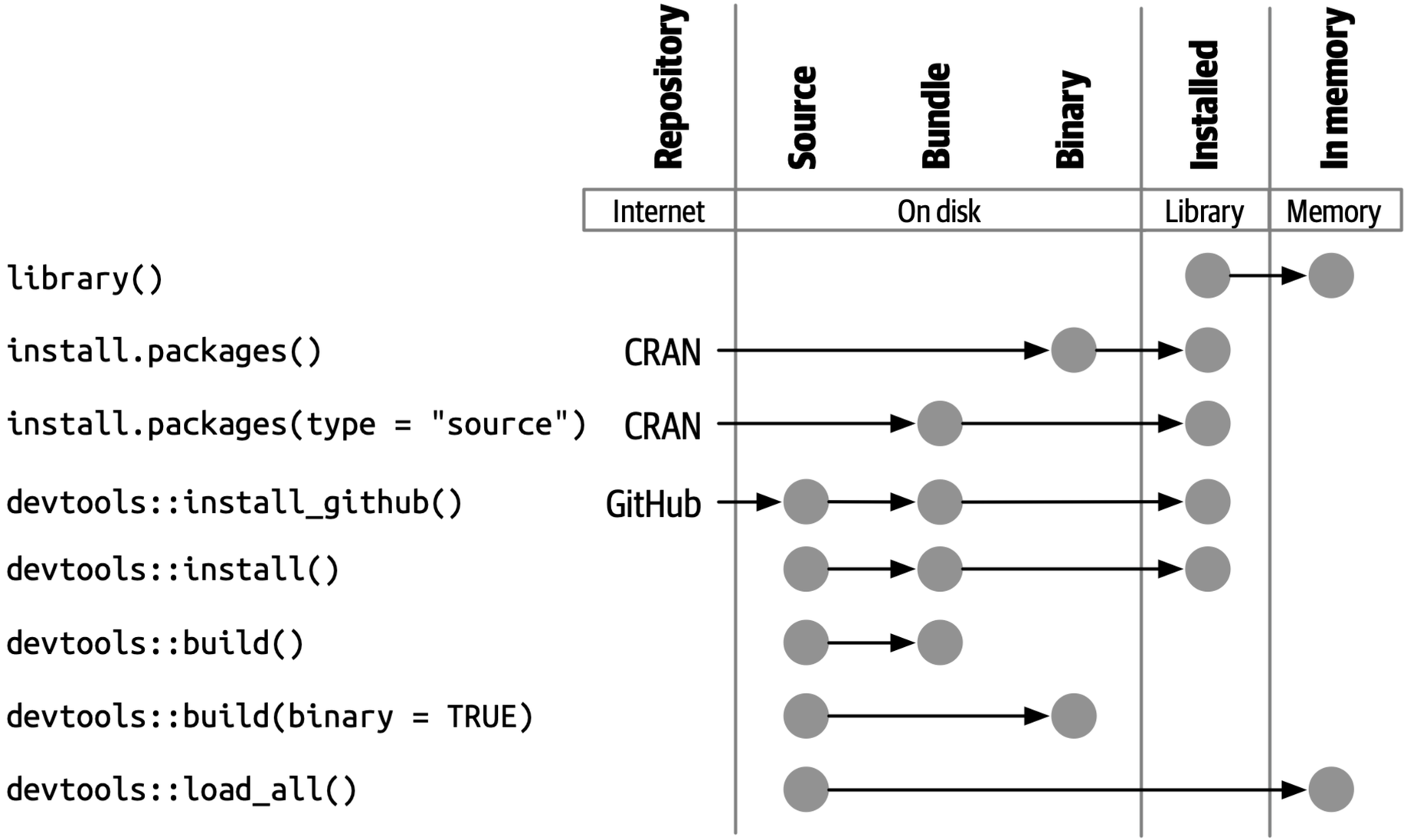
- How many libraries do you have?
- What are they? (Put them in the etherpad)

Package Structure and State

Five forms

Source	• Directory of files with specific structure • What you interact with as you build a package
Bundle	• Package compressed into a single file (tar.gz) via `devtools::build()` -> `R CMD build` • Vignettes are built and files listed in `.Rbuildignore` are left behind
Binary	• Platform-specific compressed file (.tgz, .zip) • Made with `devtools::build(binary = TRUE)` -> `R CMD INSTALL --build`
Installed	• Binary package decompressed into a user's library • `install.packages()`
In Memory	• Loaded and ready for use in an R session • `library()`

Package Structure and State



Let’s make a package together

We will:

- Create a simple package
- Use git to track our changes
- Push the code to a repository on GitHub
- Create tests for our functions
- Create documentation for our functions
- Create a package website (if we have time)

We won’t:

- Talk (much) about function writing and design
- Talk about how to include data in your package

libminer

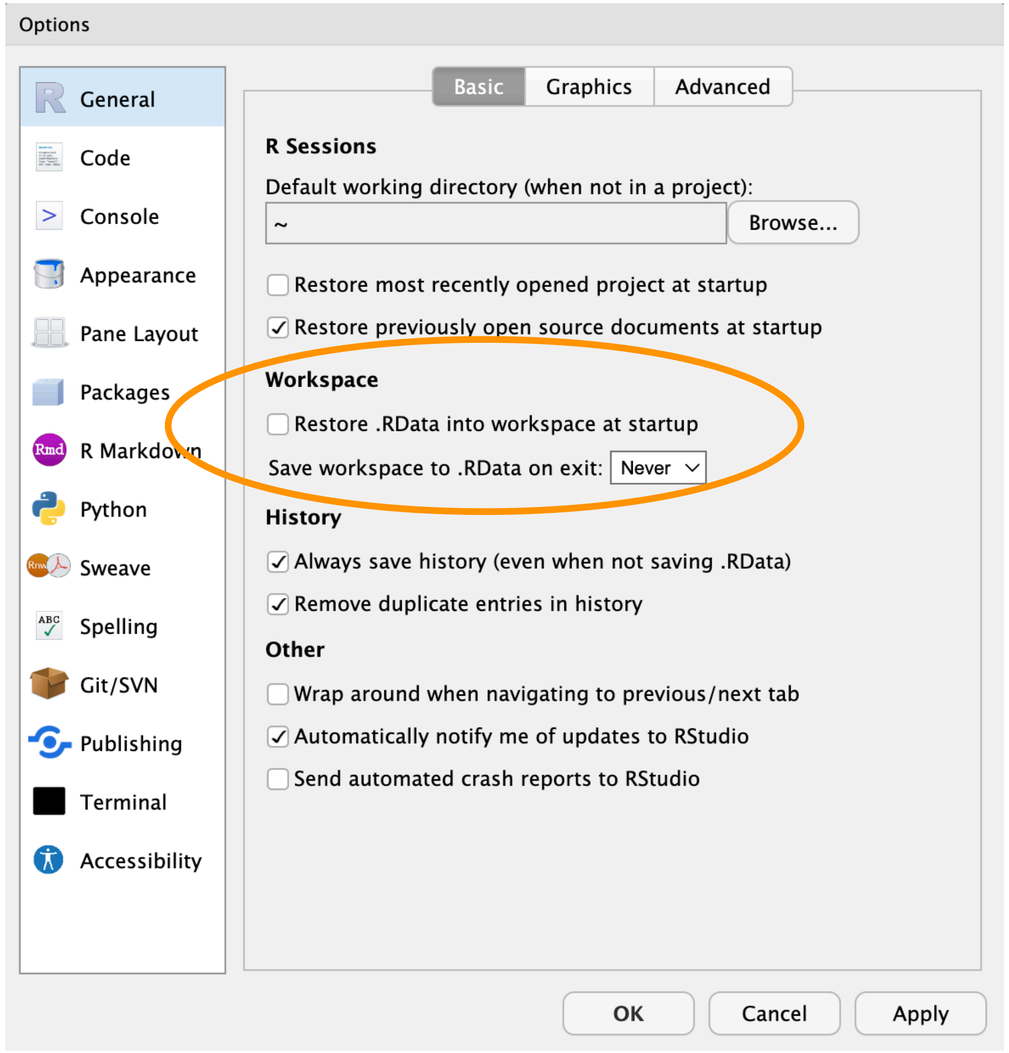
Sneak peak of our end goal on GitHub

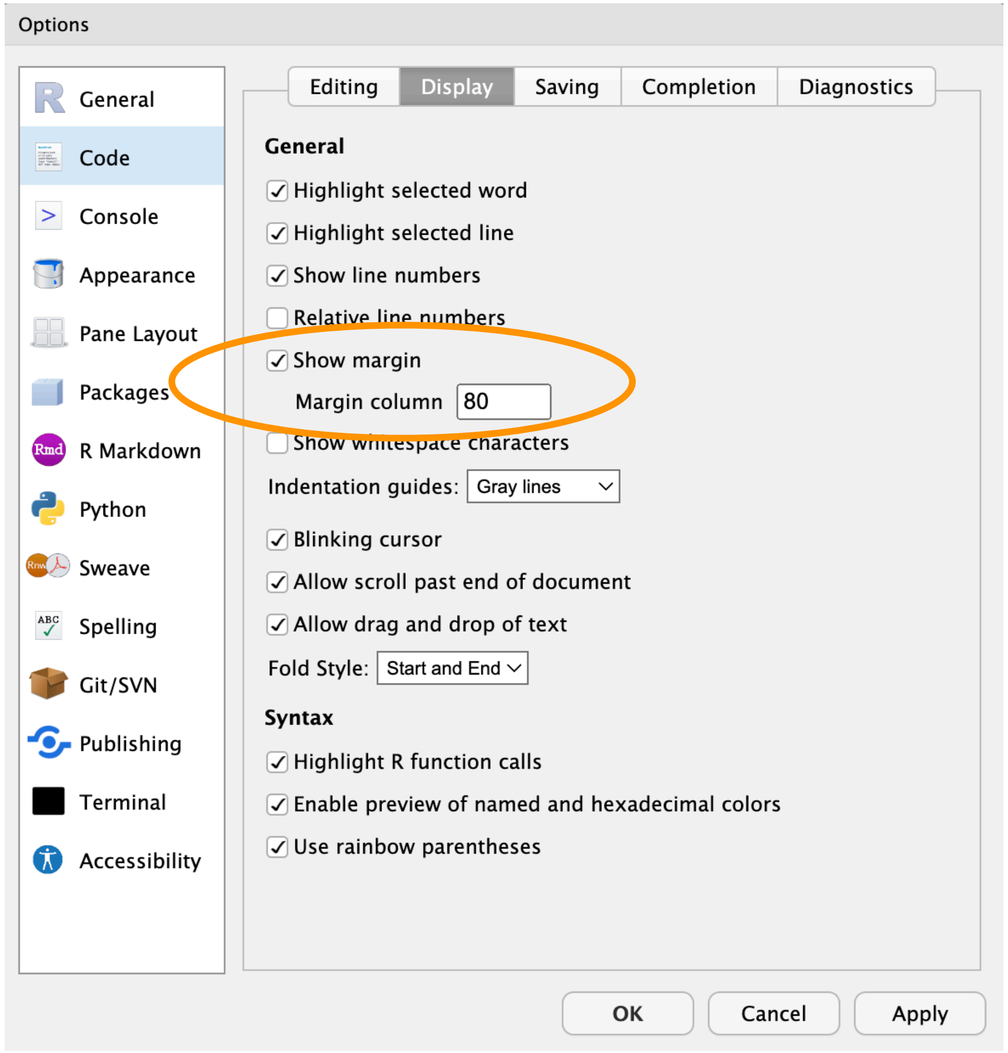
- https://github.com/ateucher/libminer
- A package to explore our local R package libraries

Get Ready

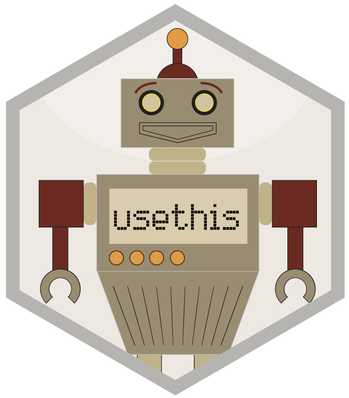
Configure RStudio

Tools > Global Options





Tools 🧰



- R >= 4.3.0
- RStudio (https://posit.co/download/rstudio-desktop/)
- Packages:

```
install.packages(
  c("devtools", "roxygen2", "testthat", "knitr")
)
```

Create a package

Load devtools 📦

```
library(devtools)
#> Loading required package: usethis

packageVersion("devtools")
#> [1] '2.4.5'
```

- Update if necessary!
- Provides a suite of functions to aid package development
- Loads **usethis**, the source of most functions we will be using

create_package() 

```
create_package("~/Desktop/mypackage")
#> ✔ Creating '/Users/jane/Desktop/mypackage/'
#> ✔ Setting active project to '/Users/jane/Desktop/mypackage'
#> ✔ Creating 'R/'
#> ✔ Writing 'DESCRIPTION'
#> Package: mypackage
#> Title: What the Package Does (One Line, Title Case)
#> Version: 0.0.0.9000
#> Authors@R (parsed):
#>     * First Last <first.last@example.com> [aut, cre] (YOUR-ORCID-ID)
#> Description: What the package does (one paragraph).
#> License: `use_mit_license()`, `use_gpl3_license()` or friends to pick a
license
#> Encoding: UTF-8
#> Roxygen: list(markdown = TRUE)
#> RoxygenNote: 7.2.3
#> ✔ Writing 'NAMESPACE'
#> ✔ Writing 'mypackage.Rproj'
#> ✔ Adding '^mypackage\\.Rproj$' to '.Rbuildignore'
#> ✔ Adding '.Rproj.user' to '.gitignore'
#> ✔ Adding '^\\.Rproj\\.user$' to '.Rbuildignore'
#> ✔ Setting active project to '<no active project>'
```

create_package() 📦

```
create_package("~/Desktop/mypackage")
```

```
├── .Rbuildignore
├── .Rproj.user
├── .gitignore
├── DESCRIPTION
├── NAMESPACE
├── R
└── mypackage.Rproj
```

- Creates directory
- Sets up basic package skeleton
- Opens a new RStudio project
- Activates "build" pane in RStudio

use_git()

- `use_git_config(`
  `user.name = "Jane Doe",`
  `user.email = "jane@example.org"`
  `)`
- `use_git()`
- Turns package directory into a git repository
- Commits your files (with a prompt)
- Restarts RStudio (with a prompt)

```
use_git()

#> ✔ Setting active project to
#>       '/Users/Jane/rrr/mypackage'
#> ✔ Adding '.Rhistory', '.Rdata',
#>     '.httr-oauth', '.DS_Store',
#>     '.quarto' to '.gitignore'
#> There are 5 uncommitted files:
#> * '.gitignore'
#> * '.Rbuildignore'
#> * 'DESCRIPTION'
#> * 'metrify.Rproj'
#> * 'NAMESPACE'
#> Is it ok to commit them?
#>
#> 1: Absolutely not
#> 2: Not now
#> 3: Yeah
```

`devtools::use_devtools()`

Automatically load devtools when R starts

- Opens .Rprofile file
- Copies code to your clipboard
- Paste into .Rprofile
- Restart R

```
if (interactive()) {
  # Load package dev packages:
  suppressMessages(require("devtools"))
}
```

⌨ Ctrl+Shift+F10 (Windows & Linux)
⌨ Cmd+Shift+0 (macOS)

use_r()

Write your first function

- R code goes in `R/`
- Name the file after the function it defines

```
use_r("my-fun")

#> ✔ Setting active project to '/Users/jane/rrr/mypackage'
#> • Edit 'R/my-fun.R'
```

- Put the definition of your function (and only the definition!) in this file

Test your function in the new package

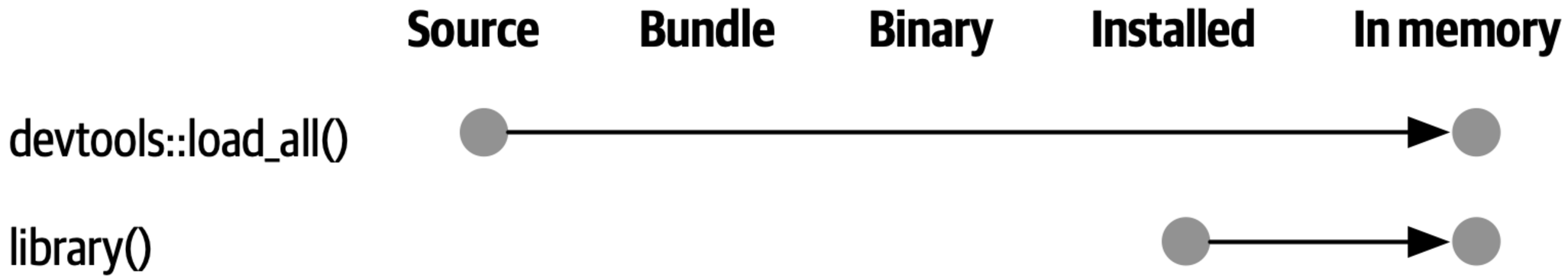
But how?

- ~~`source("R/my-fun.R")`~~
- ~~Send function to console using RStudio (Ctrl/CMD+Return)~~
- `devtools::load_all()`

⌨ Ctrl+Shift+L (Windows & Linux)
⌨ Cmd+Shift+L (macOS)

`load_all()`

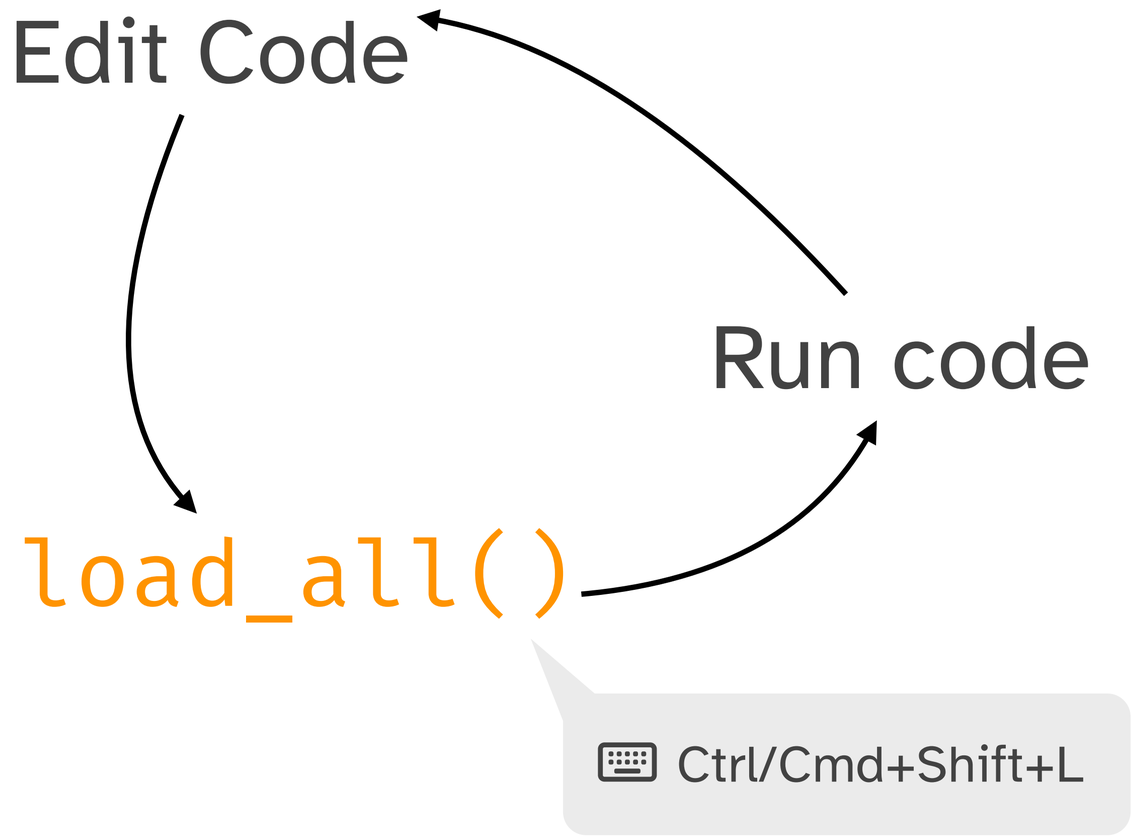
== install.packages() + library()



- Simulates building, installing, and attaching your package
- Makes all of the functions from your package immediately available to use
- Allows fast iteration of editing and test-driving your functions
- Good reflection of how users will interact with your package*

*With `load_all()`, unexported functions are also made available, which they are not via install and attach

Workflow



Try it out, and commit your changes 

check()

Run R CMD check from within R

```
check()

#> ── R CMD check results ──────────────────────────────
#> Duration: 3.1s
#>
#> ❯ checking DESCRIPTION meta-information ... WARNING
#>   Invalid license file pointers: LICENSE
#>
#> 0 errors ✔ | 1 warning ✖ | 0 notes ✔
```

- `check()` early and often
- Reduce future pain by catching problems early*

If it hurts, do it more often, by Martin Fowler:
https://martinfowler.com/bliki/FrequencyReducesDifficulty.html

R CMD check

3 types of messages

- **ERRORs:** Severe problems - always fix.
- **WARNINGs:** Problems that you should fix, and must fix if you're planning to submit to CRAN.
- **NOTEs:** Mild problems or, in a few cases, just an observation.
    - When submitting to CRAN, try to eliminate all NOTEs.

Licenses

`use_*_license()`

- Permissive:
  - **MIT:** simple and permissive.
  - **Apache 2.0:** MIT + provides patent protection.
- Copyleft:
  - Requires sharing of improvements.
  - **GPL (v2 or v3)**
  - **AGPL, LGPL** (v2.1 or v3)
- Creative commons licenses:
  - Appropriate for data packages.
  - **CC0:** dedicated to public domain.
  - **CC-BY:** Free to share and adapt, must give appropriate credit.

use_mit_license()

```
✔ Adding 'MIT + file LICENSE' to License
✔ Writing 'LICENSE'
✔ Writing 'LICENSE.md'
✔ Adding '^LICENSE\\.md$' to '.Rbuildignore'
```

The DESCRIPTION file

Package metadata

- Make yourself the author
  - Name & Email
  - ORCID (optional)
- Write descriptive
  - `Title:`
  - `Description:`

Ctrl+.

start typing DESCRIPTION

```
Package: mypackage
Title: What the Package Does (One Line, Title Case)
Version: 0.0.0.9000
Authors@R: person(
    "First", "Last", ,
    "first.last@example.com",
    role = c("aut", "cre"),
    comment = c(ORCID = "YOUR-ORCID-ID")
  )
Description: What the package does (one paragraph).
License: `use_mit_license()`, `use_gpl3_license()` or
  friends to pick a license
Encoding: UTF-8
Roxygen: list(markdown = TRUE)
RoxygenNote: 7.2.3
```

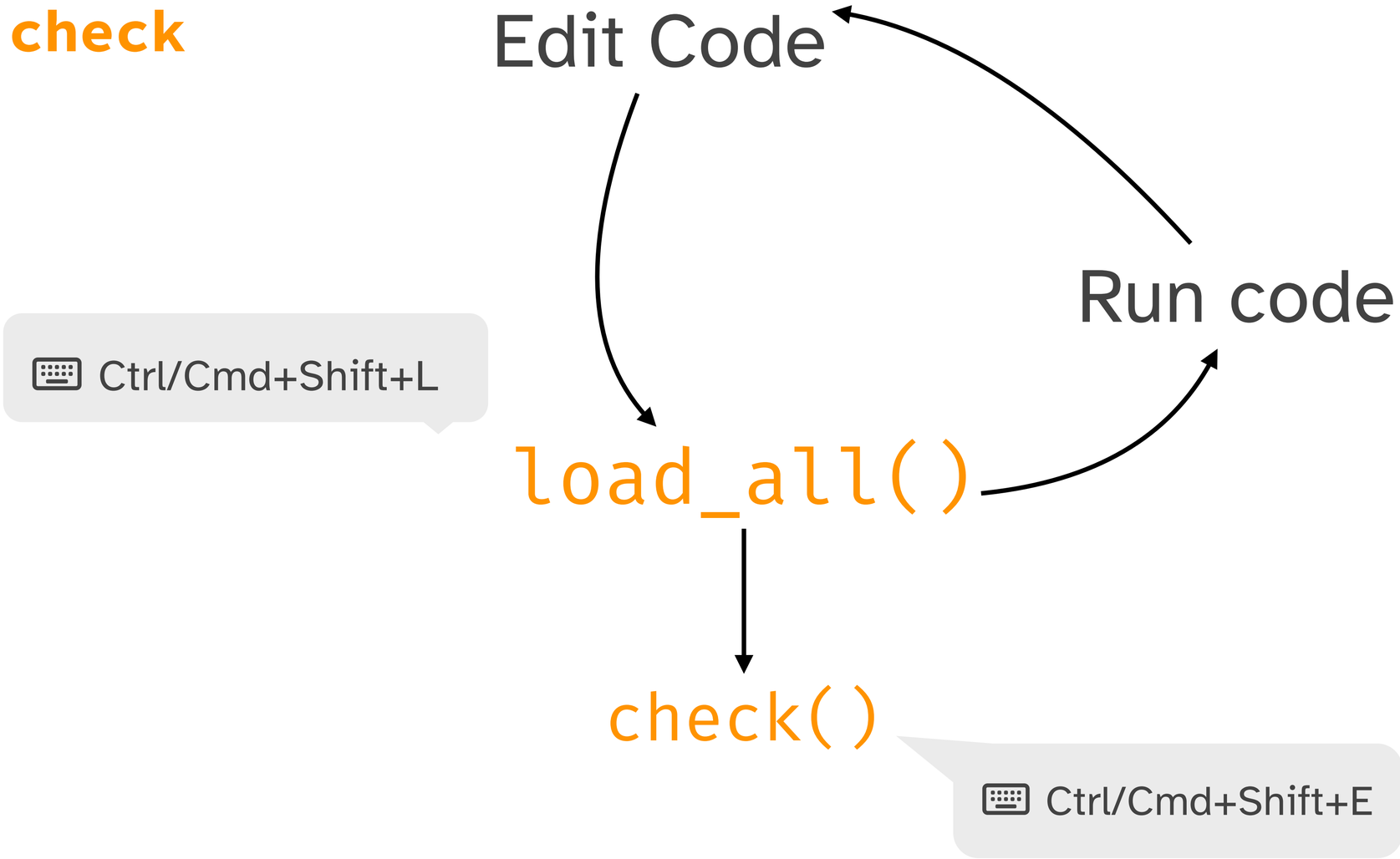
The DESCRIPTION file

Package metadata

- Take a look at the DESCRIPTION for ggplot2.
  - CRAN Package page
  - DESCRIPTION on GitHub
    - Note other Author roles:
      - ‘cph’ (copyright holder, often your employer)
      - ‘fnd’ (funder)

Workflow

Code + check



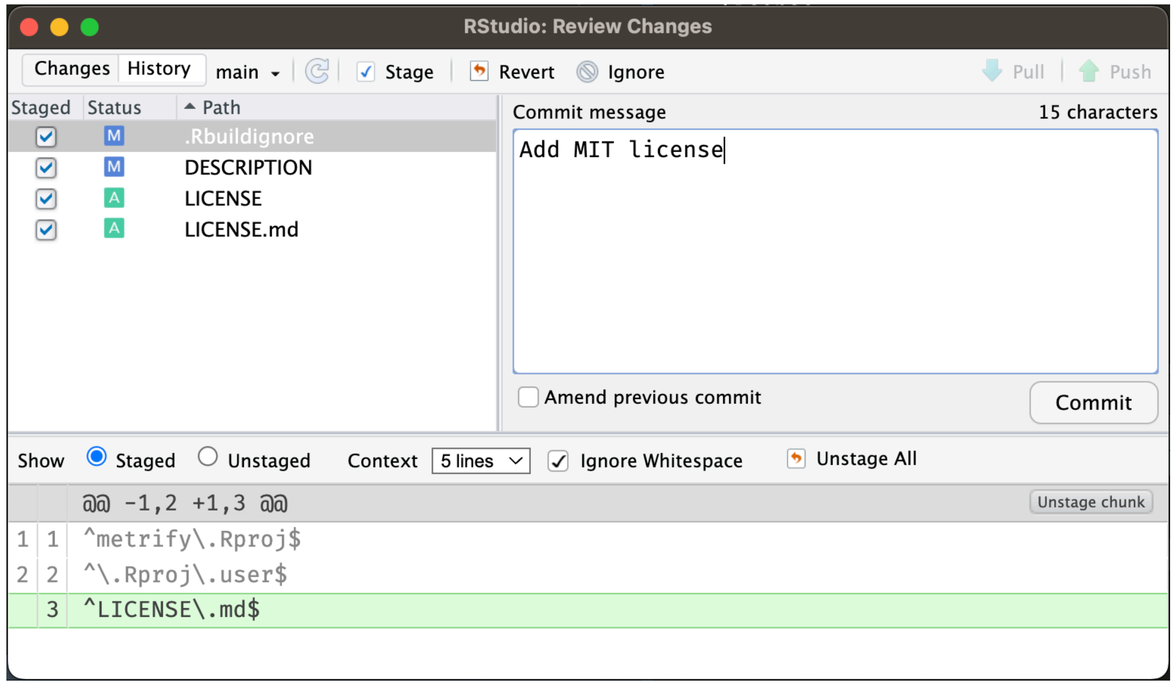
check() again

```
check()


#> ══ Documenting ═══════════════════════════════════════════════════════
…
#> ══ Building ══════════════════════════════════════════════════════════
…
#> ══ Checking ══════════════════════════════════════════════════════════
…
#> ── R CMD check results ──────────────────────────────────────────────
#> Duration: 3.1s
#>
#> 0 errors ✔ | 0 warnings ✔ | 0 notes ✔
```


TED
LASSO

Commit changes to git

```
$ git add DESCRIPTION \
          LICENSE \
          LICENSE.md \
          .Rbuildignore

$ git commit -m "Add MIT license"
```



`use_github()`

Put your package code on GitHub

- Prerequisites:
  - GitHub account
  - `create_github_token()` - follow instructions
  - `gitcreds::gitcreds_set()` - paste PAT
  - `git_sitrep()` - verify

`use_github()` - push content to new repository on GitHub

Avoid some pain of package setup: `edit_r_profile()`

And set default `DESCRIPTION` values

```
# Set usethis options:
options(
  usethis.description = list(
    "Authors@R" = utils::person(
      "Jane", "Doe",
      email = "jane@example.com",
      role = c("aut", "cre"),
      comment = c(ORCID = "0000-1111-2222-3333")
    )
  )
)
```

*https://usethis.r-lib.org/articles/usethis-setup.html

While you’re in there...

Set some other helpful defaults

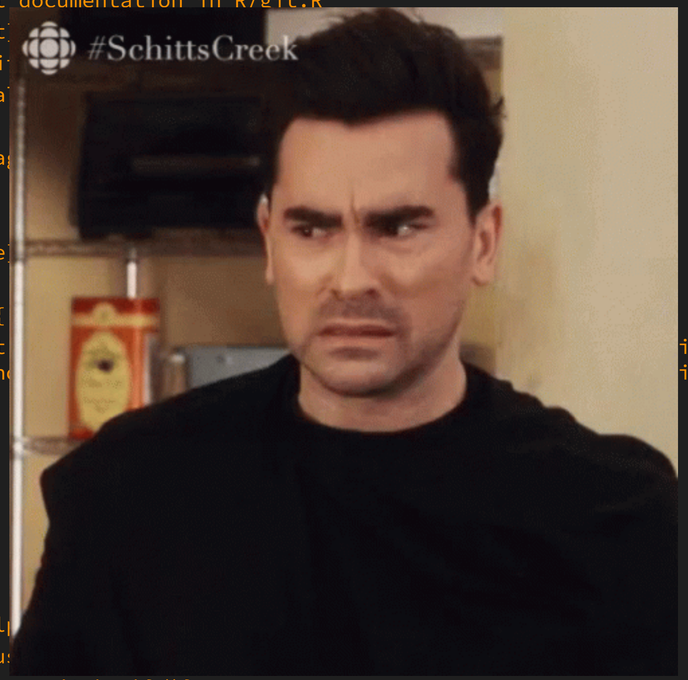
```
options(
  warnPartialMatchArgs = TRUE,
  warnPartialMatchDollar = TRUE,
  warnPartialMatchAttr = TRUE
)
```

Documentation

Documentation

`man/*.Rd`

```
% Generated by roxygen2: do not edit by hand
% Please edit documentation in R/git.R
\name{use_git
\alias{use_gi
\title{Initia
\usage{
use_git(messa
}
\arguments{
\item{message
}
\description{
\code{use_git                                              iles to
\code{.gitign                                              it.
}
\examples{
\dontrun{
use_git()
}
}
\seealso{
Other git hel
\code{\link{u
\code{\link{use_git_hook}()},
\code{\link{use_git_ignore}()}
}
\concept{git helpers}
```



Function documentation

```
> ?use_git

use_git                 package:usethis                 R Documentation

Initialise a git repository

Description:

     'use_git()' initialises a Git repository and adds important files
     to '.gitignore'. If user consents, it also makes an initial
     commit.

Usage:

     use_git(message = "Initial commit")

Arguments:

 message: Message to use for first commit.

See Also:

     Other git helpers: 'use_git_config()', 'use_git_hook()',
     'use_git_ignore()'

Examples:

     ## Not run:

     use_git()
     ## End(Not run)
```

roxygen2

- RStudio: *Code* > *Insert Roxygen Skeleton*

⌨ Cmd/Ctrl+Alt+Shift+R

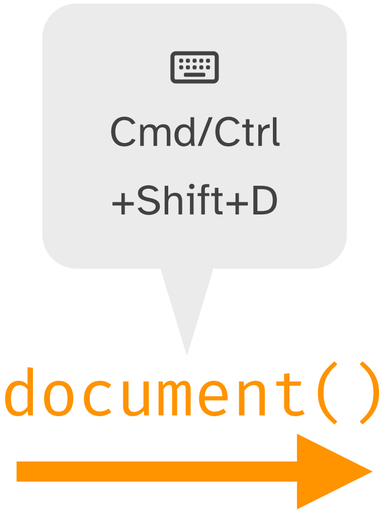
- Special comments (`#'`) above function definition in `R/*.R`
  - Title
  - Description
  - Parameters (`@param`)
  - Return value (`@return`)
  - Export tag (`@export`)
  - Example usage (`@examples`)
  - ...
- Markdown-like syntax
- Keep documentation with code!

```
#' Title

#' A longer description of what the function
#' is used for
#'
#' @param x
#' @param y
#'
#' @return
#' @export
#'
#' @examples
add <- function(x, y) {
  x+y
}
```

document()

R/use-git.R

```r
#' Initialise a git repository
#'
#' `use_git()` initialises a Git
#' repository and adds important
#' files to `.gitignore`. If user
#' consents, it also makes an
#' initial commit.
#'
#' @param message Message to use
#'    for first commit.
#' @export
#' @examples
#' \dontrun{
#'   use_git()
#' }
use_git <- function(message = "Initial
commit") {
  . . .
}
```



man/*.Rd

```
% Generated by roxygen2: do not edit by hand
% Please edit documentation in R/git.R
\name{use_git}
\alias{use_git}
\title{Initialise a git repository}
\usage{
use_git(message = "Initial commit")
}
\arguments{
\item{message}{Message to use for first commit.}
}
\description{
\code{use_git()} initialises a Git repository and adds
important files to \code{.gitignore}. If user consents,
it also makes an initial commit.
}
\examples{
\dontrun{
use_git()
}
}
```

Create roxygen comments

- Go to function definition

⌨ Ctrl+.
(Start typing function name...)

- Cursor in function definition
- Insert roxygen skeleton

⌨ Cmd/Ctrl+Alt+Shift+R

- Complete the roxygen fields
- `document()`

⌨ Cmd/Ctrl+Shift+D

- `?myfunction`
- 🎉

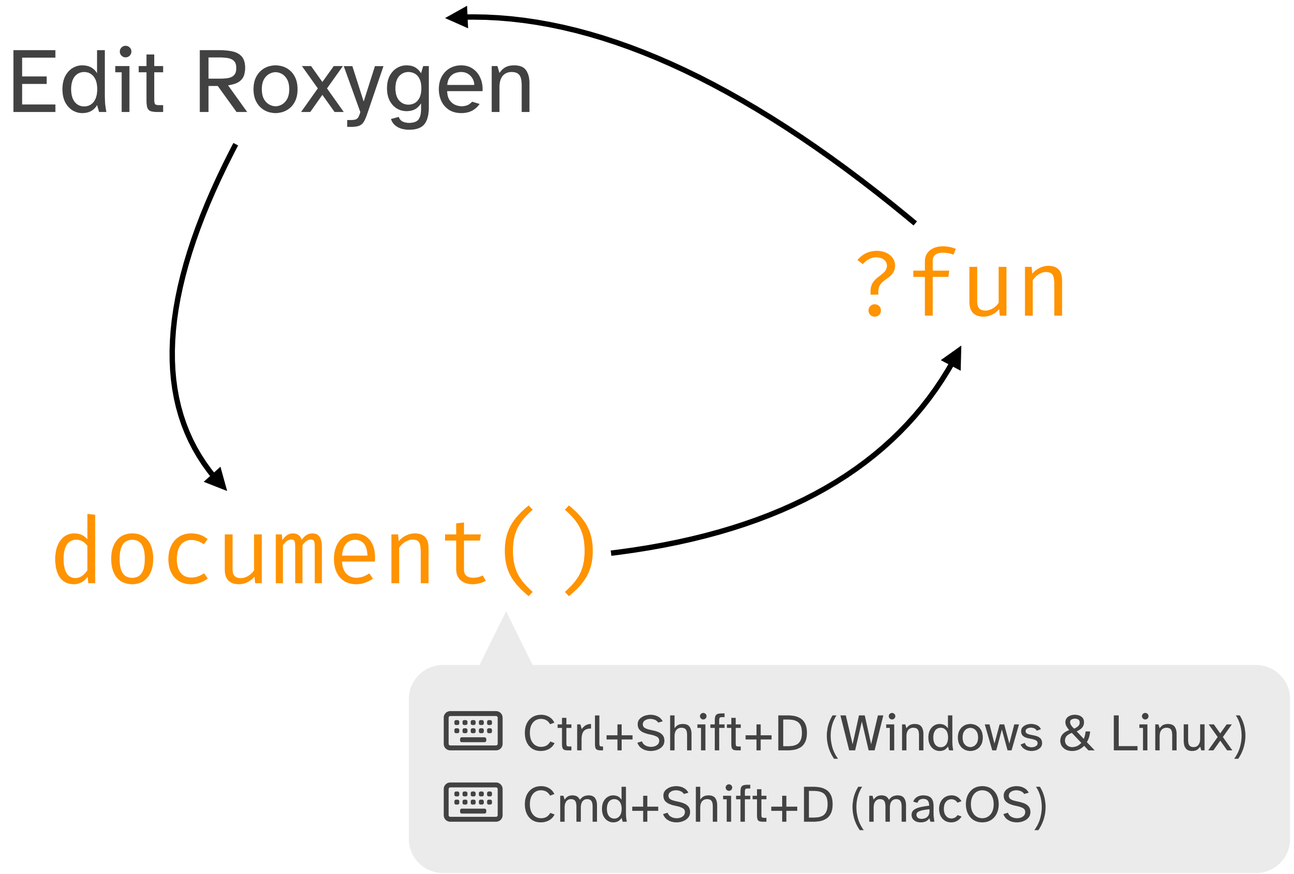
check()
Commit your changes
Push to Github

NAMESPACE

An introduction

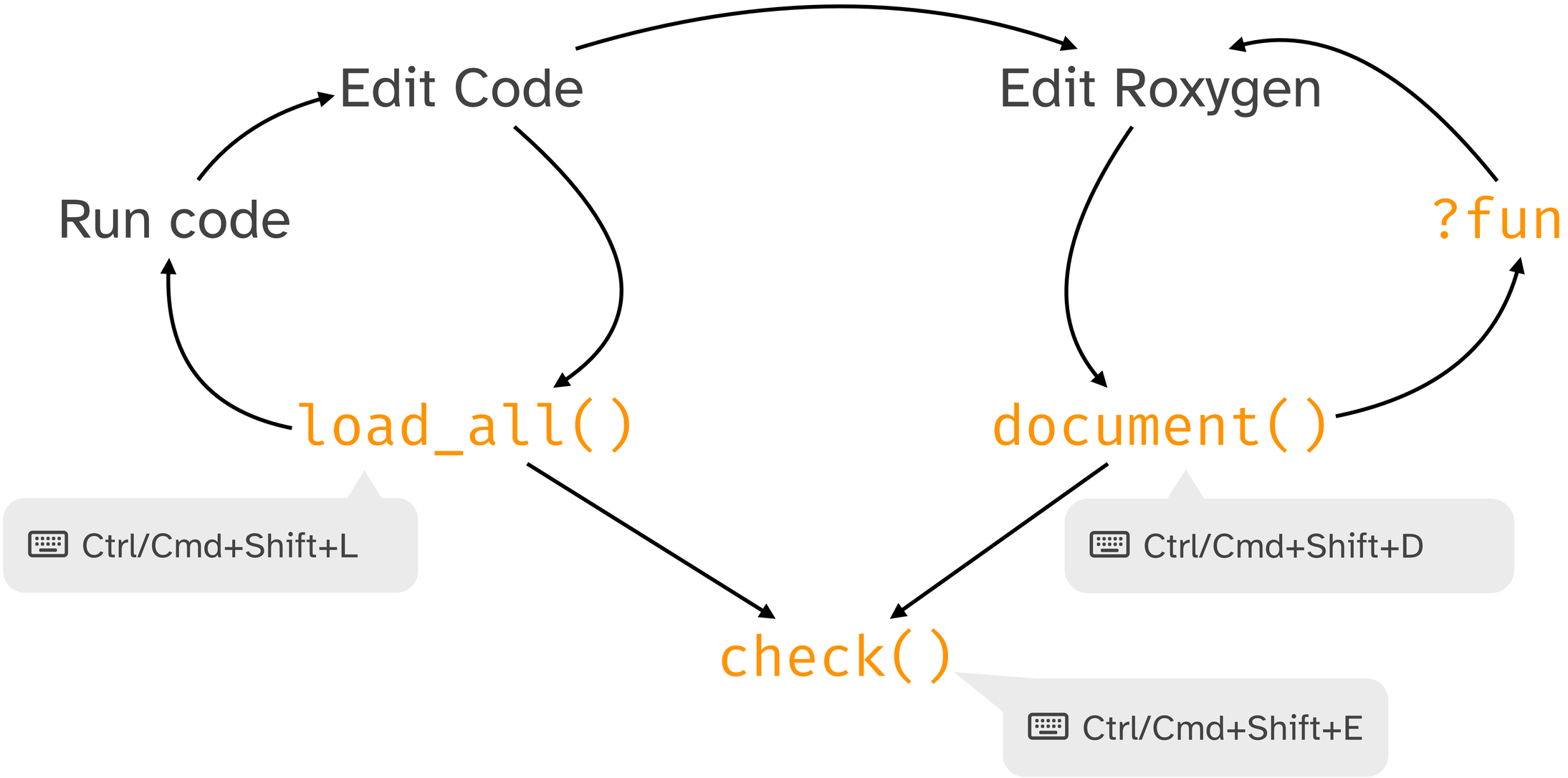
- Lists R objects that are:
  - **Exported** from your package to be used by package users
    - `export()`, `S3method()`, …
  - **Imported** from another package to be used internally by your package
    - `import()`, `importFrom()`, …
- `document()` updates the `NAMESPACE` file with directives from Roxygen comments in your R code.

Documentation workflow



Workflow

Code + documentation + check



Package-level documentation

`use_package_doc()`

```
use_package_doc()

#> ✔ Writing 'R/mypackage-package.R'
#> • Modify ‘R/mypackage-package.R’

document()
```

- Package-level help available via `?mypackage`
- Creates relevant `.Rd` file from `DESCRIPTION`
- A good place for roxygen dependency directives

check() again

```
check()


#> ── Documenting ──────────────────────────────────────────────────────
…
#> ── Building ─────────────────────────────────────────────────────────
…
#> ── Checking ─────────────────────────────────────────────────────────
…
#> ── R CMD check results ──────────────────────────────────────────────
#> Duration: 3.1s
#>
#> 0 errors ✔ | 0 warnings ✔ | 0 notes ✔
```

`install()`

Install package to your library

- `R CMD INSTALL`

  ⌨ Ctrl+Shift+B (Windows & Linux)
  ⌨ Cmd+Shift+B (macOS)

- Restart R

  ⌨ Ctrl+Shift+F10 (Windows & Linux)
  ⌨ Cmd+Shift+0 (macOS)

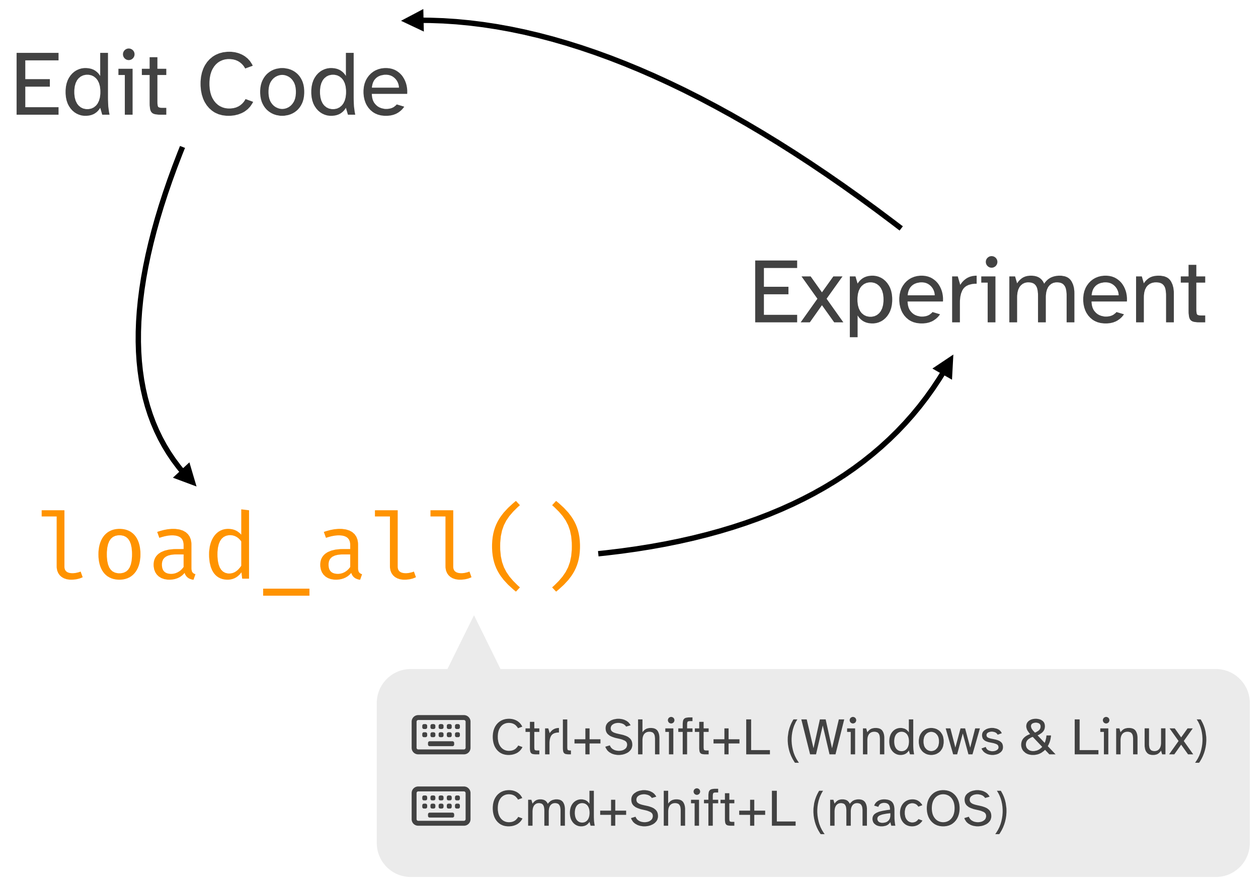
- Load package with `library()` like any other package

Commit your changes 
Push to Github 

Testing

Testing

Current workflow



Automated Testing

Benefits

- Fewer bugs
- Better code structure
- Call to action when fixing bugs
- Robust (future-proof) code

use_testthat()

Set up formal testing of your package*

```
use_testthat()

#> ✔ Adding 'testthat' to Suggests field in DESCRIPTION
#> ✔ Adding '3' to Config/testthat/edition
#> ✔ Creating 'tests/testthat/'
#> ✔ Writing 'tests/testthat.R'
#> • Call `use_test()` to initialize a basic test file and
open it for editing.
```

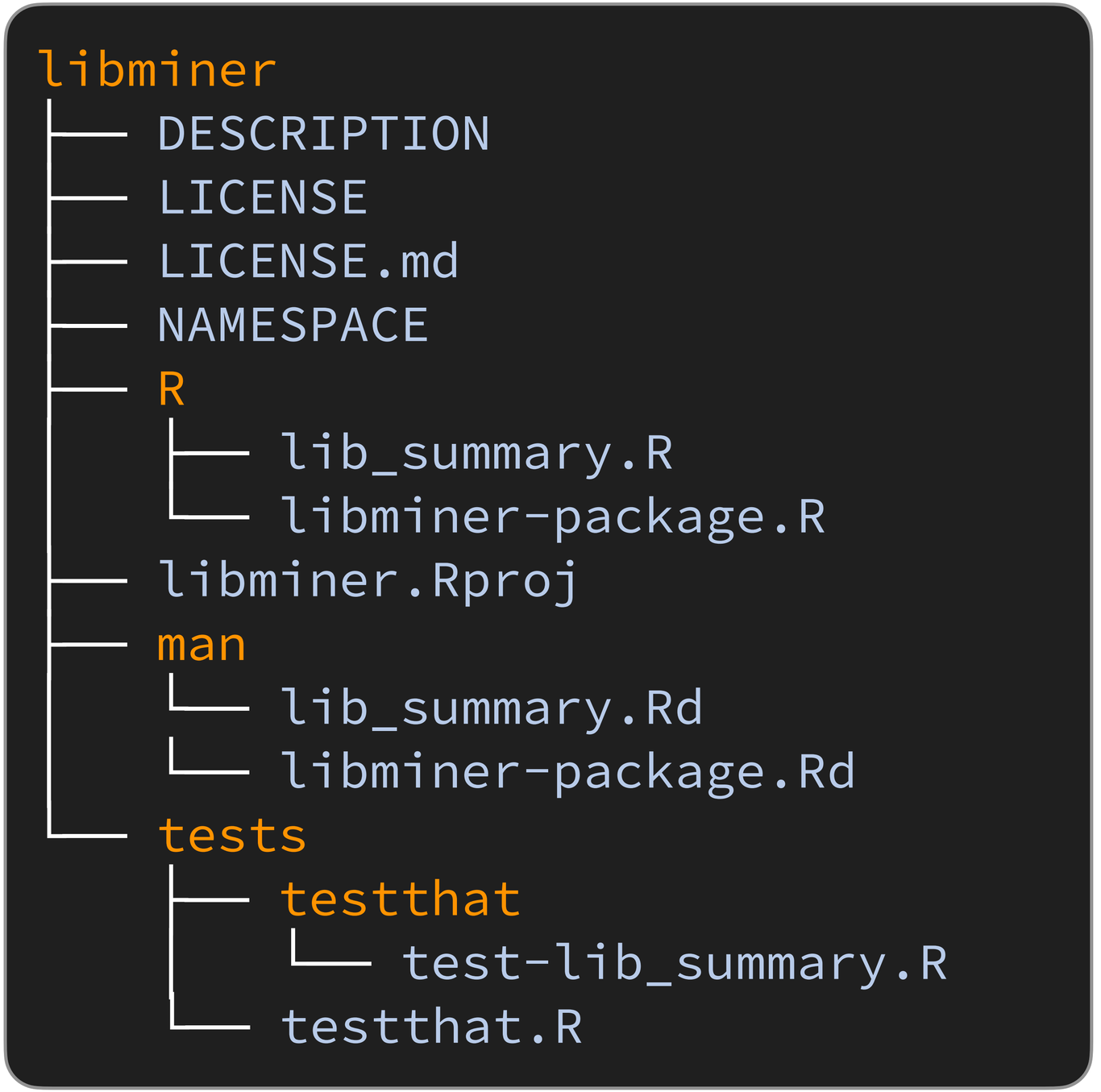
*Sorry, you still have to write the tests

use_test()

```
use_test('my-fun.R')*

#> ✔ Writing 'tests/testthat/test-my-fun.R'
#> • Edit 'tests/testthat/test-my-fun.R'
```

*Omit file name when `'R/my-fun.R'` is active file

File structure



Test structure

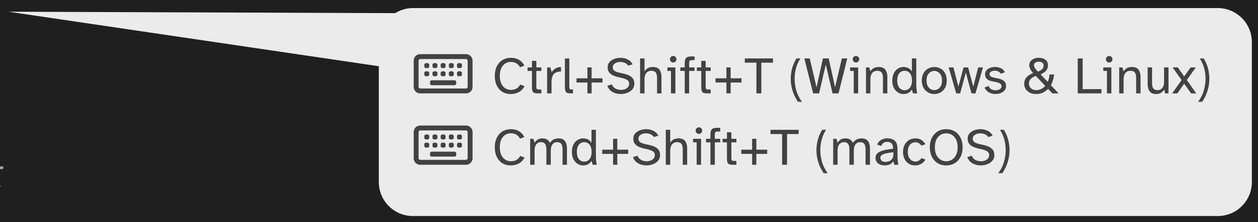
```
testthat("description of what you're testing", {
  expect_equal([function output], [expected output])
})
```

- **File:** one or more related tests
- **Test:** `test_that("...")`
  - Tests a unit of functionality (hence unit tests)
  - Contains one or more expectations
- **Expectation:** `expect_that(...)`
  - Tests a specific computation and compares it to an expected value

test()

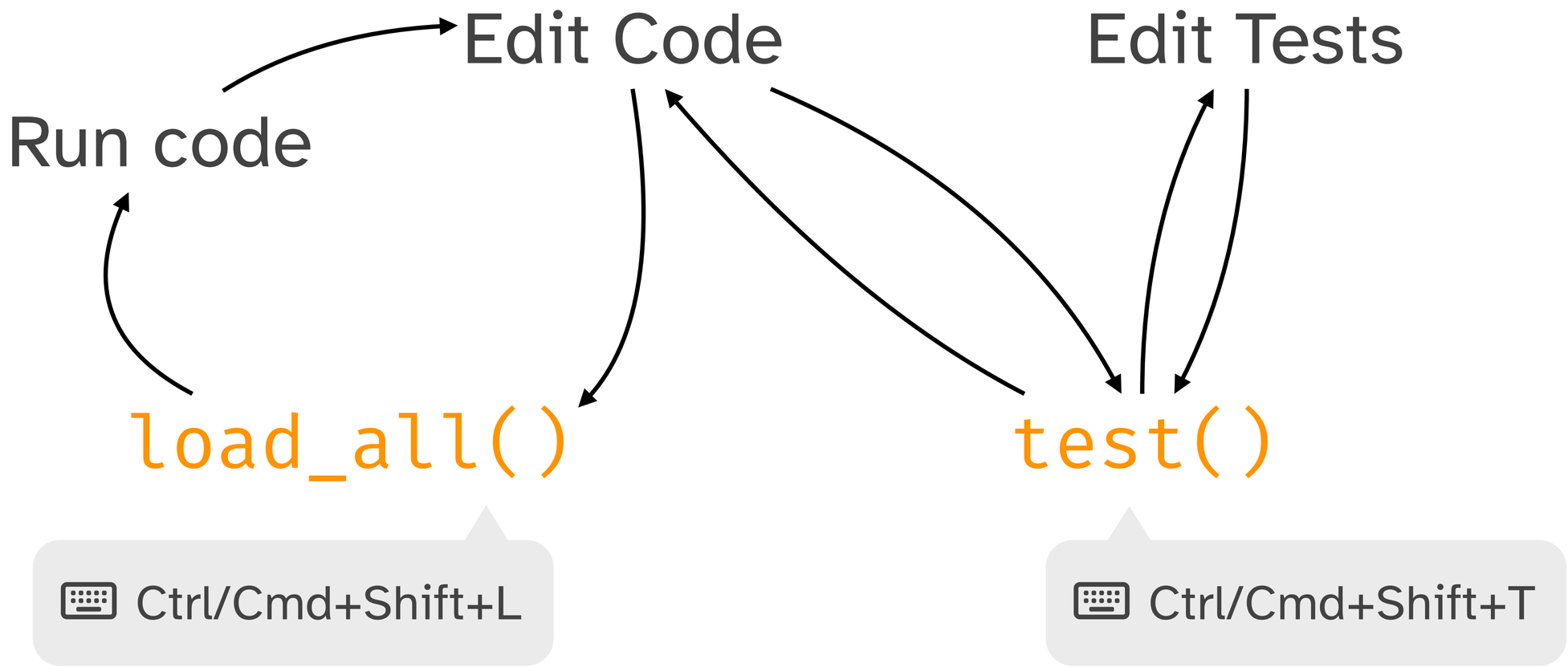
- Runs all tests in your test suite

```
test()

#> ℹ Testing
#> ✔ | F W S  OK | Context
#>
#> ⠏ |          0 |
#> ✔ |          1 |
#>
#> ══ Results ═══════════════════════════════════════════════
#> [ FAIL 0 | WARN 0 | SKIP 0 | PASS 1 ]
```



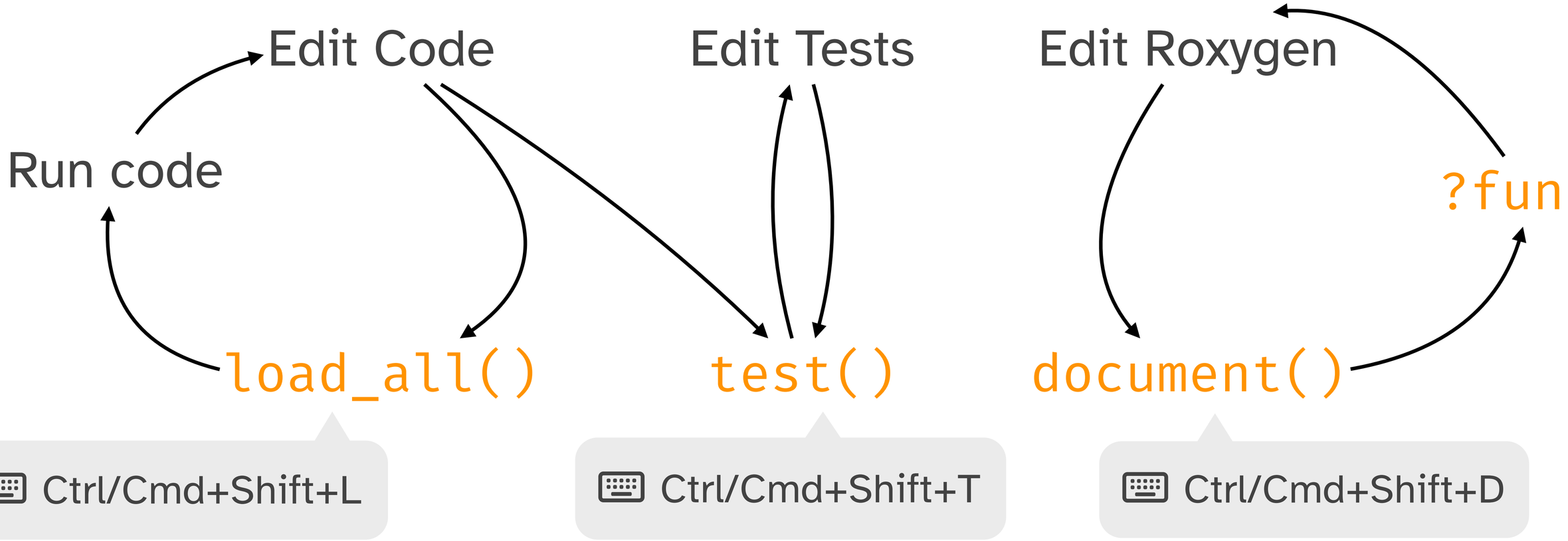
Updated workflow

Code + testing



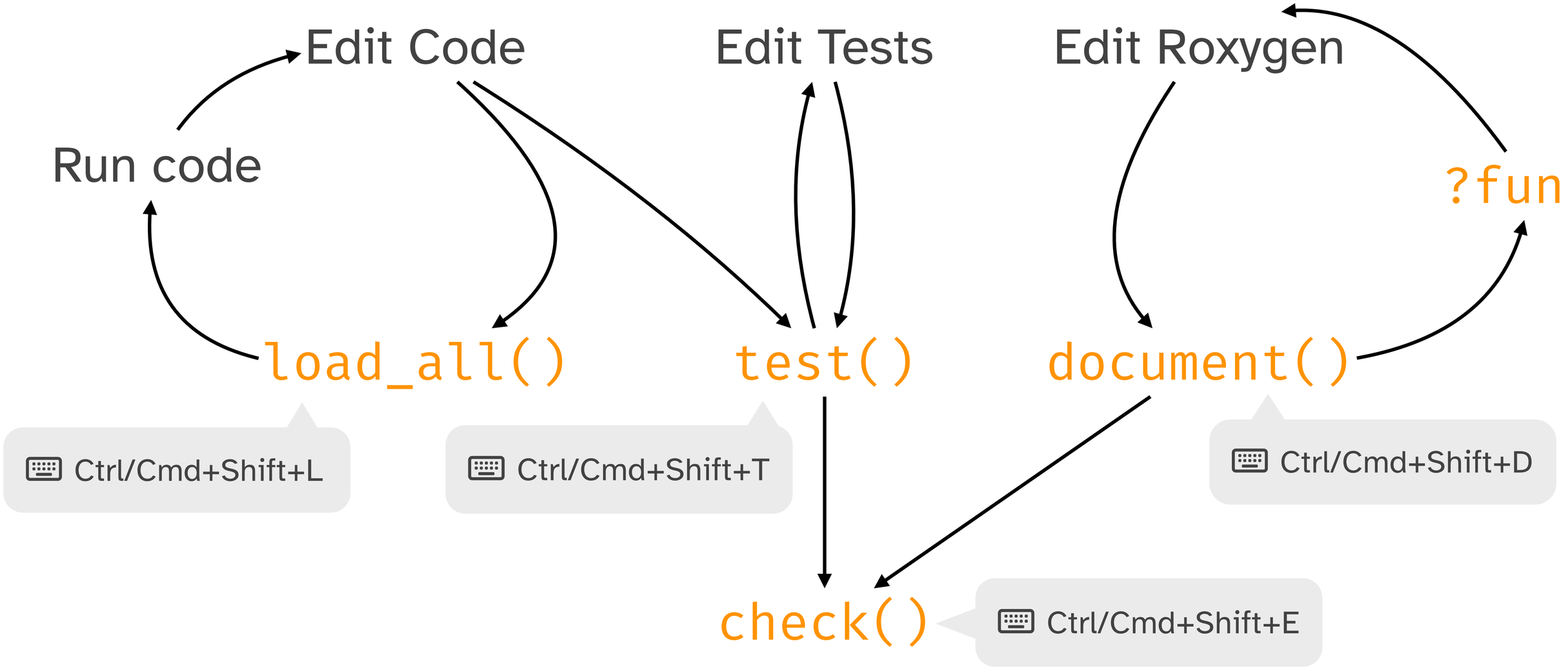
Workflow

Code + testing + documentation



Workflow

Code + testing + documentation + check



check()
Commit your changes
Push to Github

Dependencies

Use functions from another package inside your package

use_package()

Add a dependency

```
use_package("fs")
#> ✔ Adding 'fs' to Imports field in DESCRIPTION
#> • Refer to functions with `fs::fun()`
```

- Use functions from another package inside your package
- Dependencies must be declared
  - Even from included packages (`stats::sd()`, `tools::file_ext()` etc.)
- Never call `library(pkg)` in code below `R/`!

Listing dependencies in `DESCRIPTION`

Three options

- `Depends:`
  - Ensures the package is installed with your package
  - *Attaches the package when yours is attached*
  - Rarely needed or recommended
- `Imports:`
  - Ensures the package is installed with your package
  - Most common location for dependencies
- `Suggests:`
  - Does not ensure installation automatically
  - Packages required for development (running tests, building vignettes, etc).
  - Rarely used functionality (especially if the dependency is difficult to install)

Imports: DESCRIPTION vs NAMESPACE

- Listing a package in `Imports` in `DESCRIPTION` does not “import” that package.
- A package listed in `Imports` in `DESCRIPTION` may, but does not have to, appear in `NAMESPACE`
- Every package listed in `NAMESPACE` must have an entry in `Imports` (or `Depends`) in `DESCRIPTION`

3 ways to use functions from another package

1. `package::fun()`
2. Import just the functions you want to use via `@importFrom` roxygen tag:

   ```
   #' @importFrom pkg fun1 fun2
   ```

   Adds to `NAMESPACE`:

   ```
   importFrom(pkg, fun1)
   importFrom(pkg, fun2)
   ```

   *Shortcut: `usethis::use_import_from("pkg", "function")`
3. Import the entire package with `@import`:

   ```
   #' @import pkg
   ```

   Adds to `NAMESPACE:`

   ```
   import(pkg)
   ```

Use your new dependency

Write a function using a function from the dependent package

- Write/edit function using dependency: `pkg::fn()`
- Edit roxygen comments
- `document()`
  - Writes `man/*.Rd` files & regenerates `NAMESPACE`
- Update tests

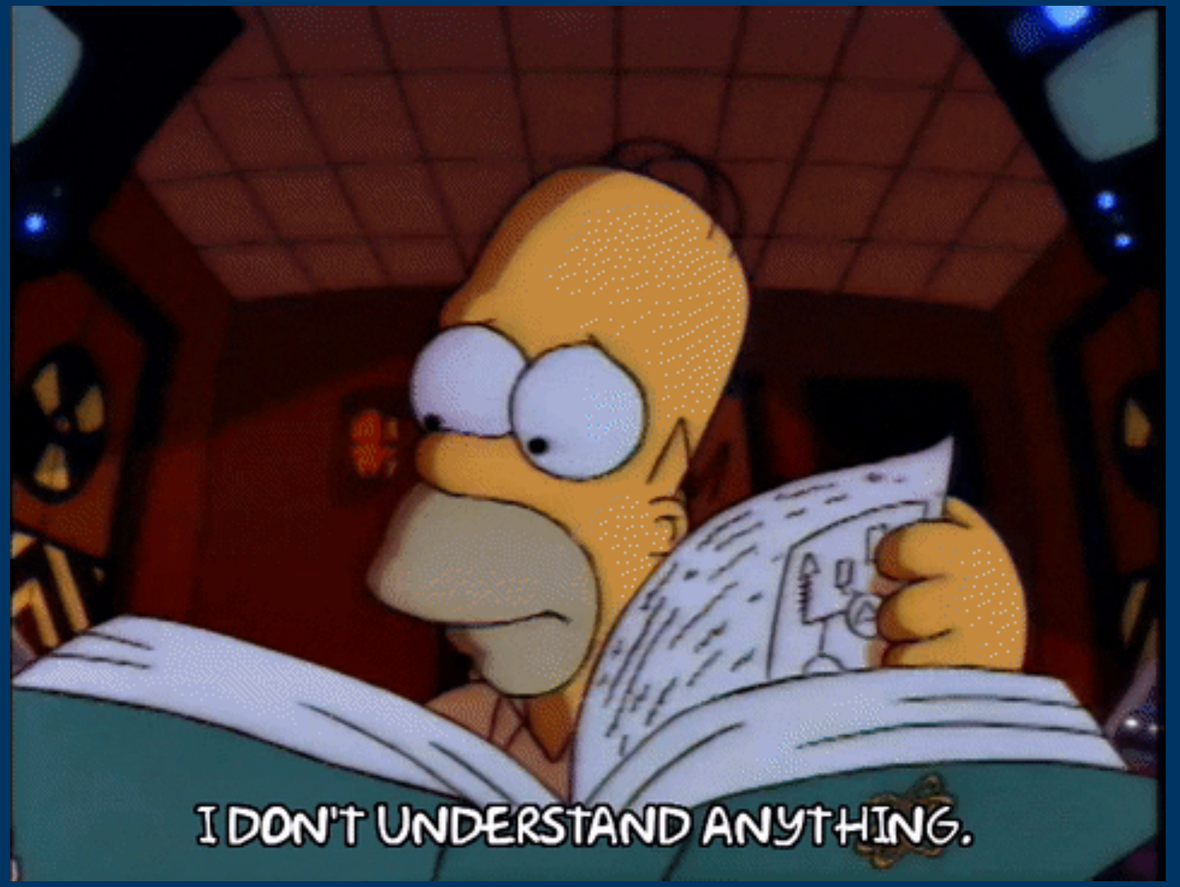
Let’s add one more

`usethis::use_import_from("pkg", "function")`

- See:
  - `DESCRIPTION`
  - `R/mypackage-packge.R`
  - `NAMESPACE`
- Write/edit function using dependency: `fn()`
- `*test()`

check()
Commit your changes
Push to Github

README



use_readme_rmd()

Generates `README.md`, your package's home page on GitHub

```
use_readme_rmd()

#> ✔ Writing 'README.Rmd'
#> ✔ Adding '^README\\.Rmd$' to '.Rbuildignore'
#> • Update 'README.Rmd' to include installation instructions.
#> ✔ Writing '.git/hooks/pre-commit'
```

- The purpose of the package
- Installation instructions
- Example usage

`build_readme()`

README.Rmd -> README.md

- Installs package to a temporary directory before rendering
- README.md renders on the front page of your GitHub repo

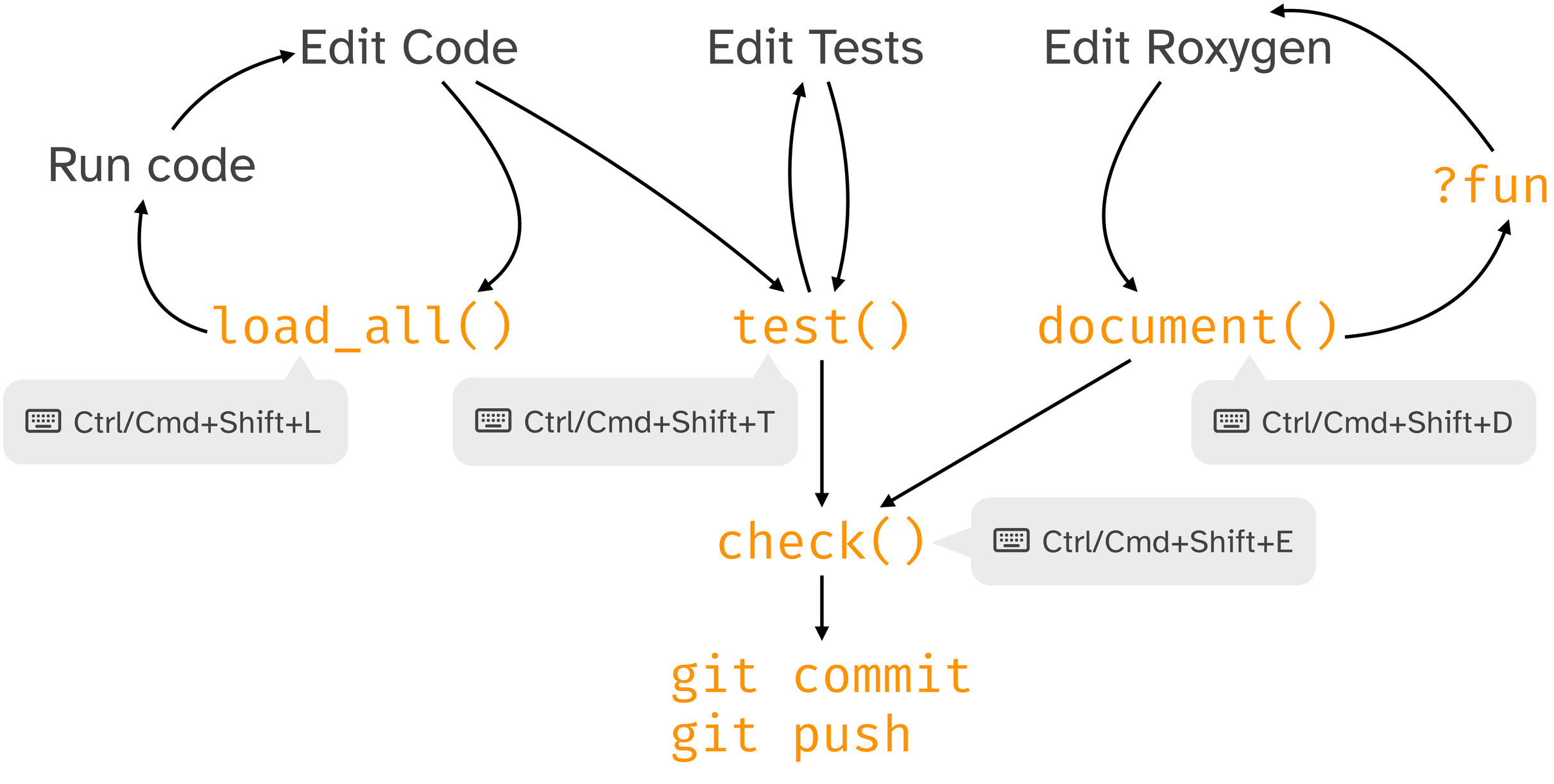
Final `check()` and `install()`

You did it!

```
check()

#> ── R CMD check results ──────────
#> Duration: 3.1s
#>
#> 0 errors ✔ | 0 warnings ✔ | 0 notes
```

```
install()

#> ── R CMD build ──────────────────
#> checking for file '/Users/jane/rrr/mypackage/DESCRIPTION' ...  ✔
#> preparing 'mypackage':
#> checking DESCRIPTION meta-information ...  ✔
#> checking for LF line-endings in source and make files and shell
scripts
#> checking for empty or unneeded directories
#> building 'mypackage_0.0.0.9000.tar.gz'
#> Running /usr/local/bin/R CMD INSTALL \
#>   /tmp/RtmpK6WnOX/mypackage_0.0.0.9000.tar.gz --install-tests
#> * installing to library '/Users/jane/Library/R/arm64/4.3/library'
#> * installing *source* package 'mypackage' ...
#> ** using staged installation
#> ** help
#> *** installing help indices
#> ** building package indices
#> ** testing if installed package can be loaded from temporary
location
#> ** testing if installed package can be loaded from final location
#> ** testing if installed package keeps a record of temporary
installation path
#> * DONE (mypackage)
```

Review: Workflow



Commit your changes 
Push to Github 

Review: functions

Run once

- `create_package()`
- `use_git()`
- `use_github()`
- `use_mit_license()`
- `use_testthat()`
- `use_readme_rmd()`

Run periodically

- `use_r()`
- `use_test()`
- `use_package()`
- `rename_files()`

Run frequently

- `load_all()`

⌨ Ctrl/Cmd+Shift+L

- `document()`

⌨ Ctrl/Cmd+Shift+D

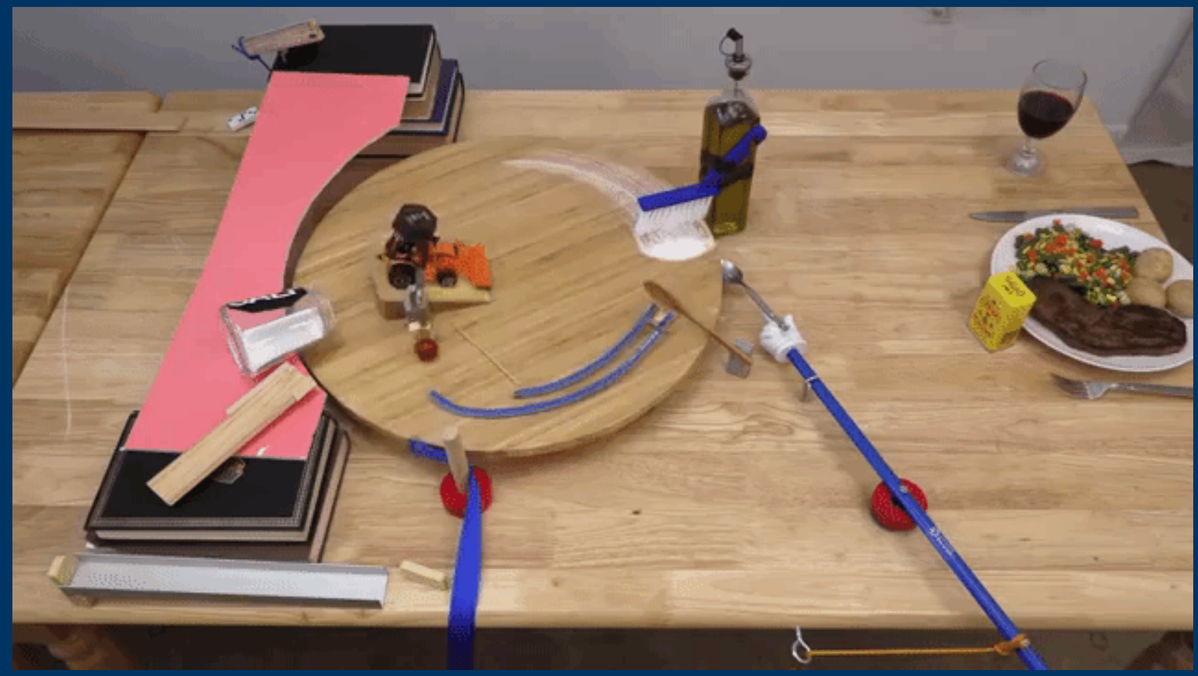
- `test()`

⌨ Ctrl/Cmd+Shift+T

- `check()`

⌨ Ctrl/Cmd+Shift+E

Continuous Integration



use_github_action()

github.com/r-lib/actions

- `"check-standard":` Runs `R CMD check` when you push
- `"test-coverage":` Compute test coverage and report at `codecov.io`
    - (Requires an account and API key)
- `"pr-commands":` Enables automatic documentation and styling of code via special PR comments
- And more...*

*https://github.com/r-lib/actions/tree/v2-branch/examples

use_pkgdown_github_pages()

pkgdown.r-lib.org/

- Automatically creates a website using pkgdown:
  - Function documentation
  - Dataset documentation
  - Vignettes (and articles)
  - README and NEWS
- Sets up a GitHub Action to deploy on GitHub Pages

Vignettes

Long-form documentation

- “Article” format
- Demonstrate a common use case or problem your package is designed to solve.
- `use_vignette("short-name", "Longer Title”)`

Review: functions

Run once

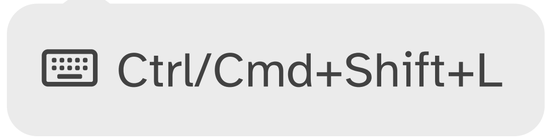
- `create_package()`
- `use_git()`
- `use_github()`
- `use_mit_license()`
- `use_testthat()`
- `use_readme_rmd()`
- `use_pkgdown_github_pages()`

Run periodically

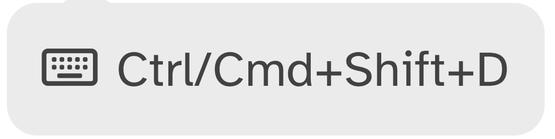
- `use_r()`
- `use_test()`
- `use_package()`
- `rename_files()`
- `use_github_action()`

Run frequently

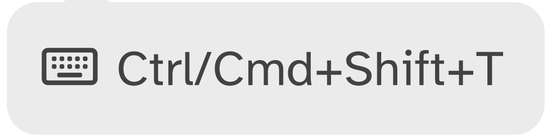
- `load_all()`



- `document()`

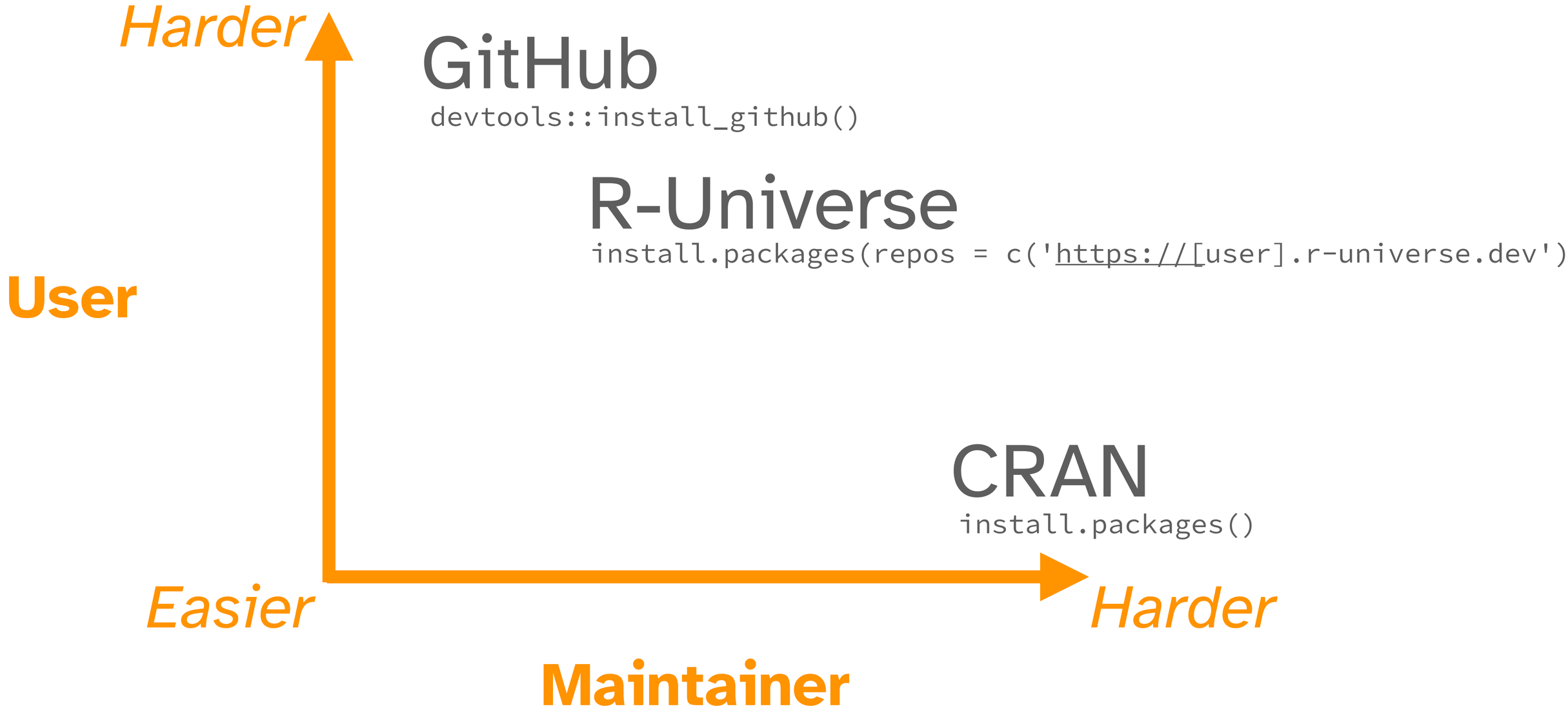


- `test()`



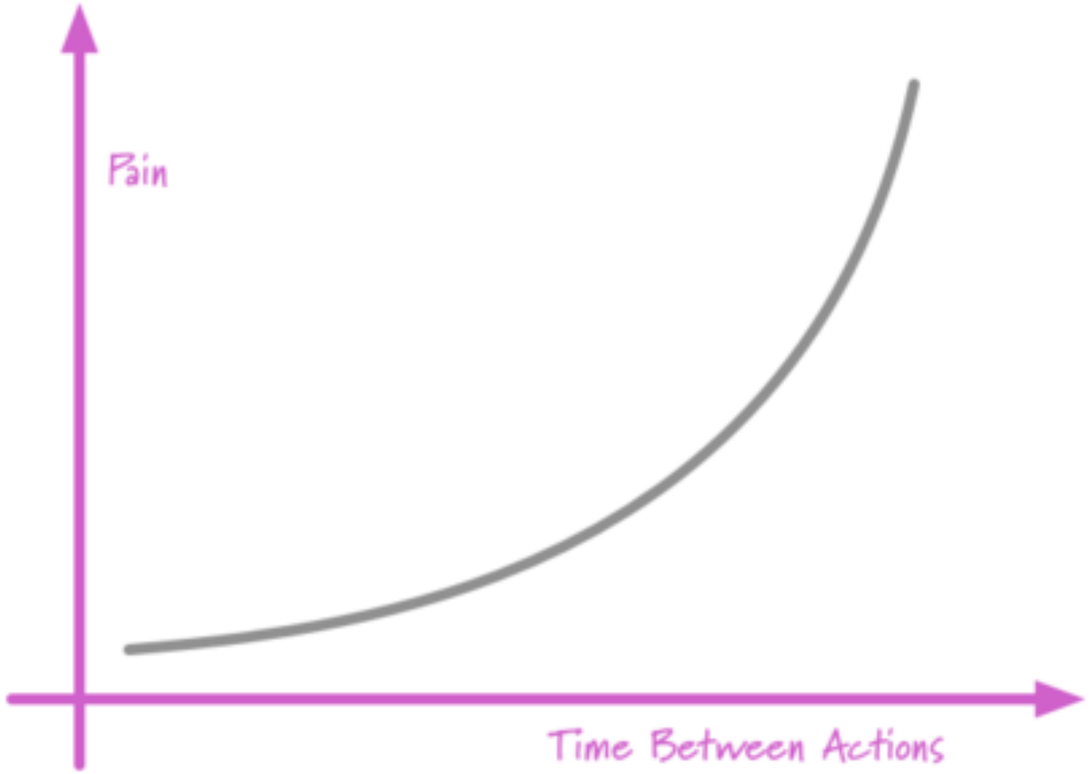
- `check()`

Package Distribution



Releasing your package to CRAN

“If it hurts, do it more often”

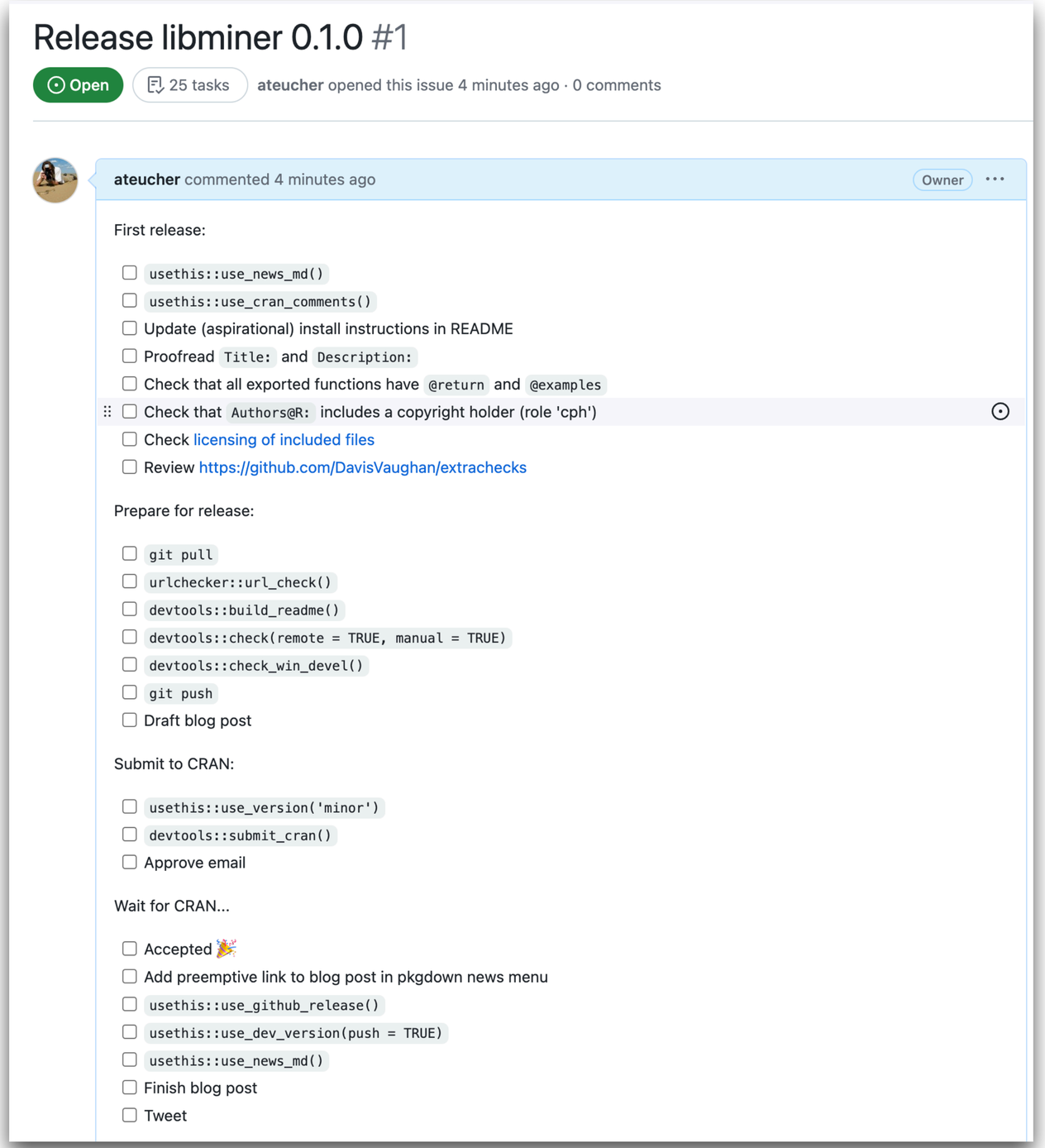


Martin Fowler: https://martinfowler.com/bliki/FrequencyReducesDifficulty.html

Releasing to CRAN

TLDR:

- `use_release_issue()`
  - Opens a GitHub issue with a checklist
- `check_win_devel()`
  - Checks on a CRAN-hosted Windows machine with R-devel
- `release()`
  - Runs through an additional list of checks
  - Builds package bundle and submits to CRAN



`use_news_md()`

Adds a NEWS.md file to your package

- Tracks version numbers
- Tracks user-facing changes between versions

use_cran_comments()

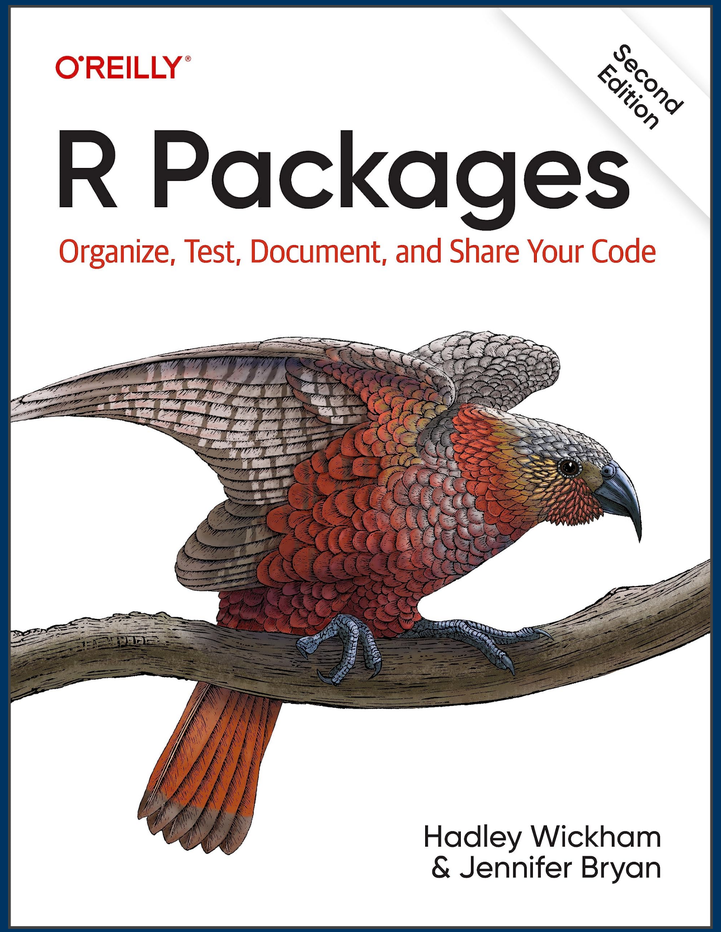
Comments that go along with your submission

```
## R CMD check results


0 errors | 0 warnings | 1 note


* This is a new release.
```

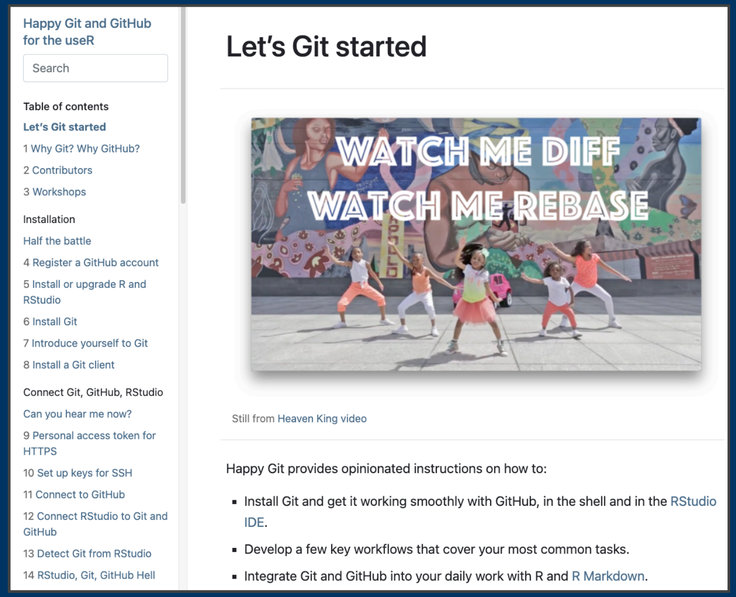
- Most times don’t need more than this
- Note if you are fixing failures seen in CRAN checks
- Note reverse dependency checks
- If your submission was rejected, note that it is a resubmission and say how you have addressed the issues

*There is always one NOTE with initial submission

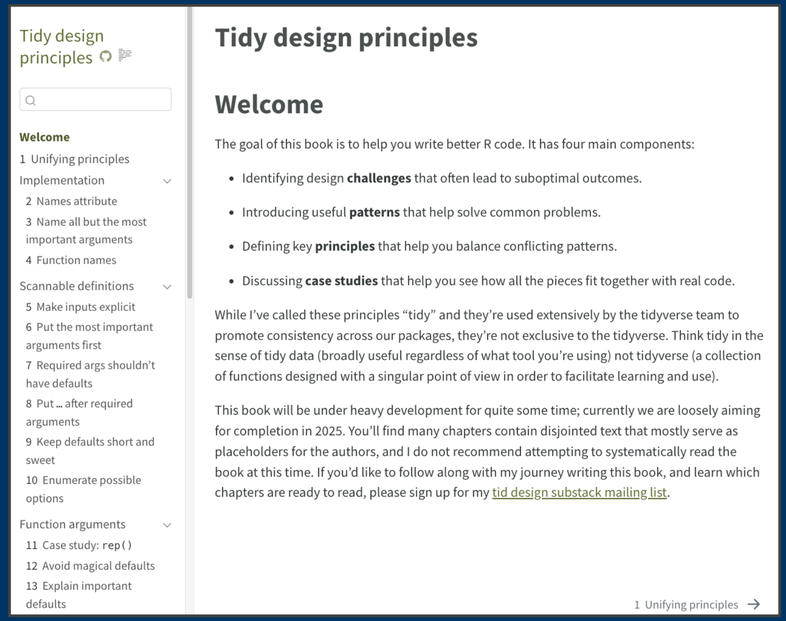
Resources



r-pkgs.org



happygitwithr.com



design.tidyverse.org

tidydesign.substack.com