

R Package Development

Stanford Libraries Workshop

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What is an R package?

- files in a specific structure
- code, data, documentation, and tests
- often on CRAN but can be on GitHub/elsewhere/local

Why develop an R package?

- provides you with structure + tools
- reusability + reproducibility
- automated checking
- sharing with others

Components

-  data/
-  R/
-  man/
-  tests/
-  DESCRIPTION
-  NAMESPACE

Components | R code

 data/

 R/

 add.R

 man/

 tests/

 DESCRIPTION

 NAMESPACE

```
add <- function(x, y) {  
  x + y  
}
```

Components | Documentation

 data/

 R/



add.R

 man/

 tests/



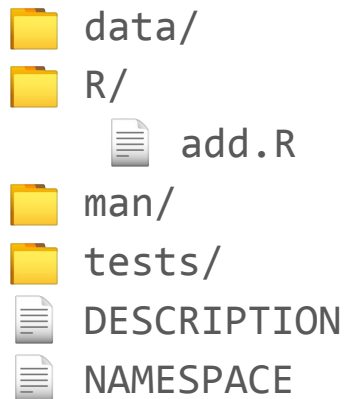
DESCRIPTION






NAMESPACE

```
##' Addition  
##'  
##' Adds two numbers together  
##'  
##' @param x A number  
##' @param y A number  
##'  
##' @return The sum of `x` and `y`  
##' @export  
add <- function(x, y) {  
  x + y  
}
```

Components | Documentation



Components | Documentation

 data/
 R/
 add.R

 man/
 add.Rd

 tests/
 DESCRIPTION

 NAMESPACE

% Generated by roxygen2: do not edit by hand

% Please edit documentation in R/add.R

```
\name{add}
\alias{add}
\title{Addition}
\usage{
  add(x, y)
}
\arguments{
  \item{x}{A number}

  \item{y}{A number}
}
\value{
  The sum of \code{x} and \code{y}
}
\description{
  Adds two numbers together
}
```

Generated by roxygen2: do not edit by hand

```
export(add)
```

Components | Documentation



Components | Tests

 data/

 R/

 add.R

 man/

 add.Rd

 tests/

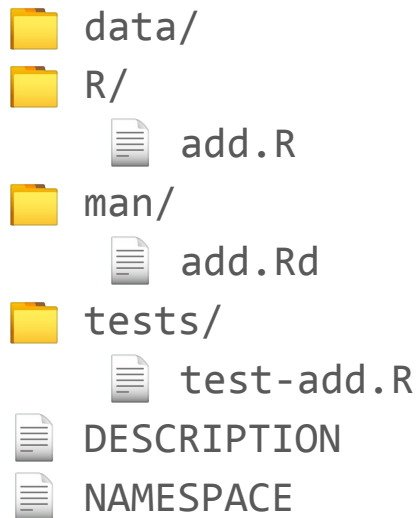
 test-add.R

 DESCRIPTION

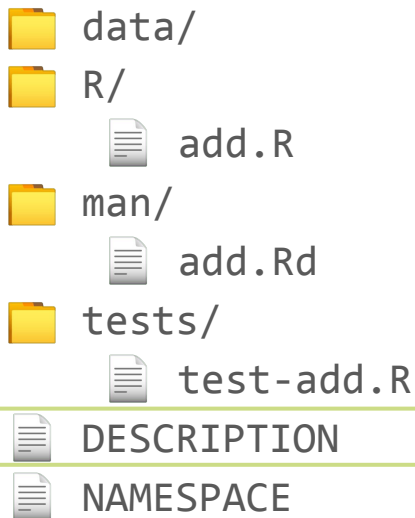
 NAMESPACE

```
test_that("addition works", {  
  expect_equal(add(2, 3), 5)  
})
```

Components | Tests

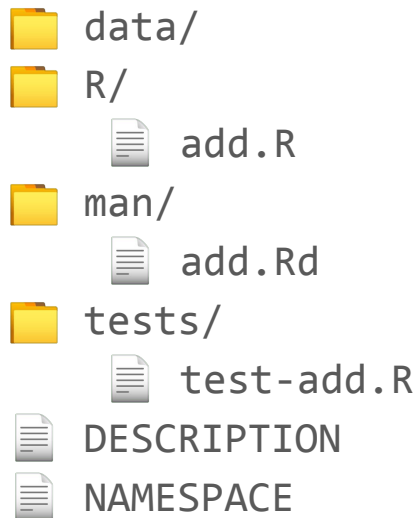


Components | Metadata

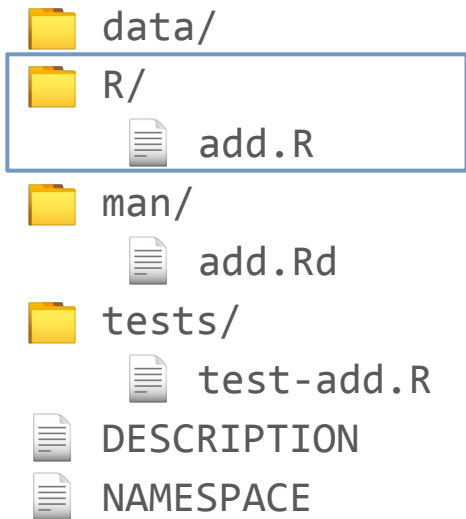


```
Package: mypackage
Title: What the Package Does (One Line, Title Case)
Version: 0.0.0.9000
Authors@R:
  person("First", "Last", , "first.last@example.com",
    role = c("aut", "cre"),
    comment = c(ORCID = "YOUR-ORCID-ID"))
Description: What the package does (one paragraph).
License: `use_mit_license()`,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

Components | Metadata

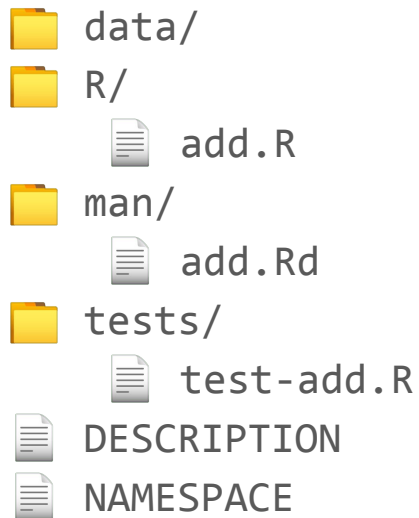


Components | Dependencies












```
##' Addition
##'
##' Adds two numbers together
##'
##' @importFrom pkg fun
##' @param x A number
##' @param y A number
##'
##' @return The sum of x and y
##' @export
add <- function(x, y) {
  x + y
}
```

Components | Dependencies



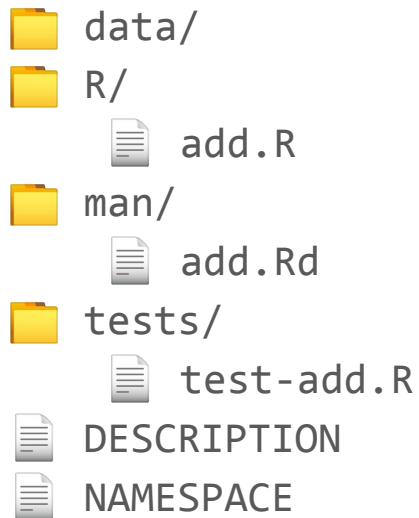
Components | Dependencies

 data/
 R/
  add.R
 man/
  add.Rd
 tests/
  test-add.R
 DESCRIPTION
 NAMESPACE












```
# Generated by roxygen2: do not edit by hand  
export(add)  
importFrom(pkg, fun)
```

Components | Dependencies



Components | Dependencies

 data/
 R/
  add.R
 man/
  add.Rd
 tests/
  test-add.R
 DESCRIPTION
 NAMESPACE



```
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"),
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Description: What the package does (one paragraph).
License: `use_mit_license()`, `use_gpl3_license()` or
  friends to pick a license
Roxygen: list(markdown = TRUE)
RoxygenNote: 7.2.3
Imports:
  pkg
```

Tools | usethis

Setup

`create_package()`
Create a package or project

`use_*_license()`
License a package

`use_git()`
Initialise a git repository

`use_package_doc()`
Package-level documentation

`use_testthat()`
Set up overall testing infrastructure

Development

`use_data()`
Create package data

`use_package()`
Depend on another package

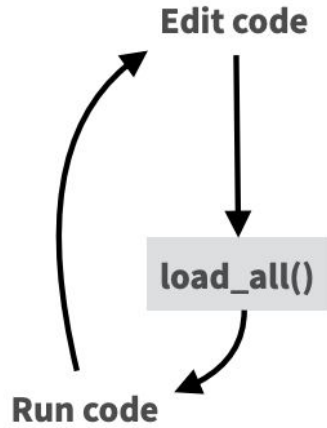
`use_import_from()`
Import a function from another package

`use_r()` `use_test()`
Create or edit R or test files

usethis.r-lib.org

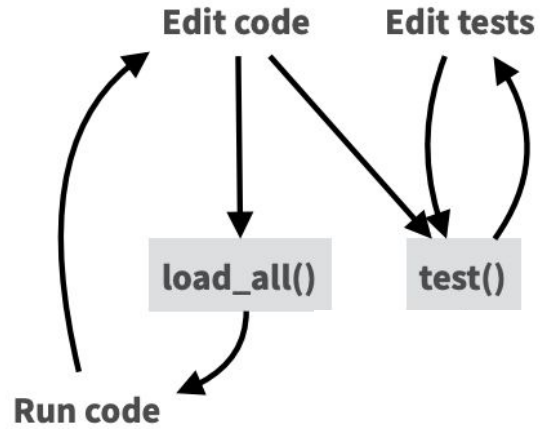
Workflows

Workflows | Code



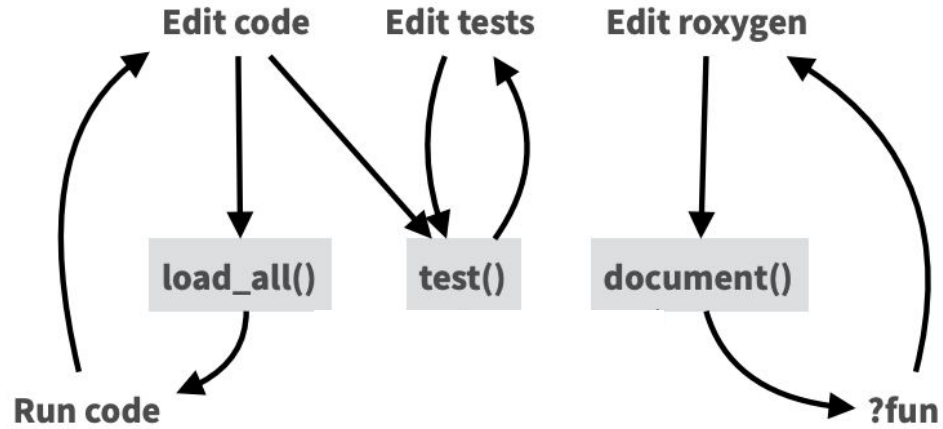
devtools.r-lib.org

Workflows | Tests



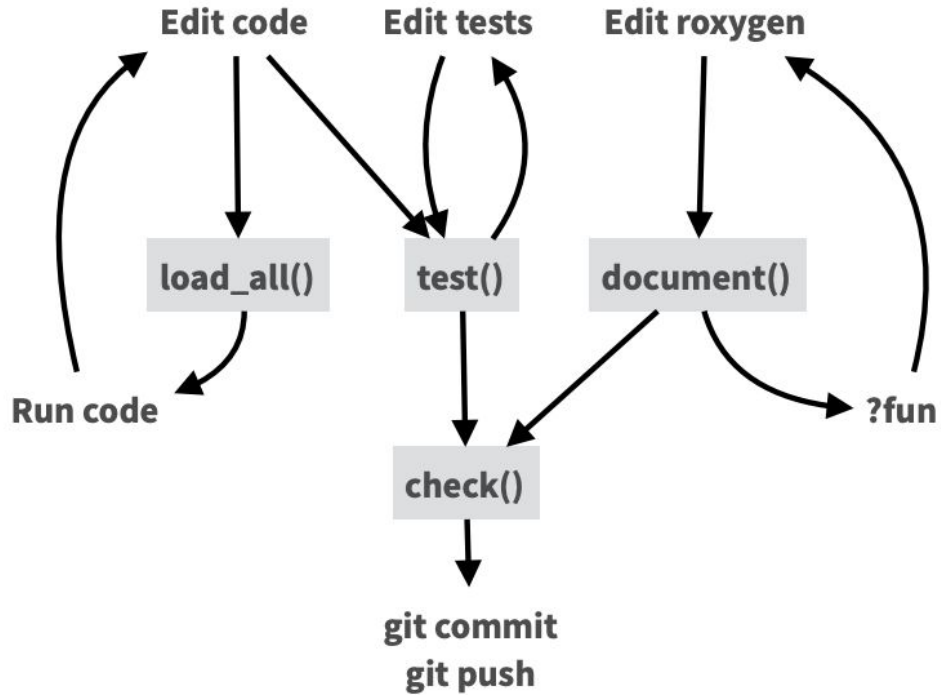
devtools.r-lib.org

Workflows | Documentation



devtools.r-lib.org

Workflows | Check



devtools.r-lib.org

Bonus Components

 inst/

 vignettes/

 data/ +  data_raw/

README.Rmd + README.md

NEWS.md

pkgdown

GitHub actions

CRAN release

Resources

R packages by Hadley Wickham and Jenny Bryan
r-pkgs.org

usethis.r-lib.org
devtools.r-lib.org

Happy Git and GitHub for the useR
happygitwithr.com

Advanced R by Hadley Wickham
adv-r.hadley.nz

these slides on mikabr.io