R Package Development
Create Package Documentation

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https://forwards.github.io

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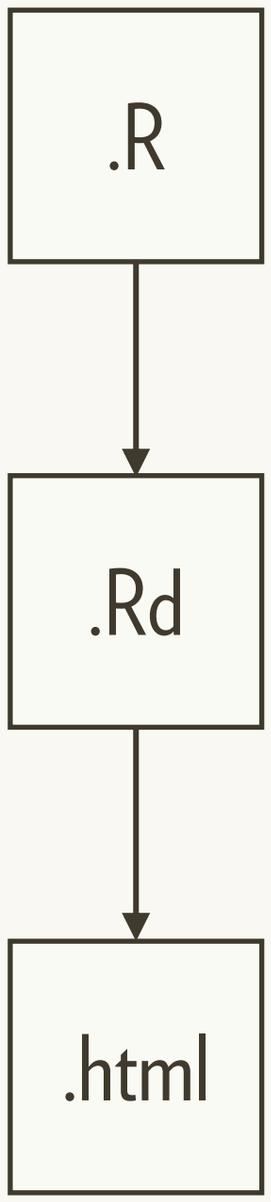
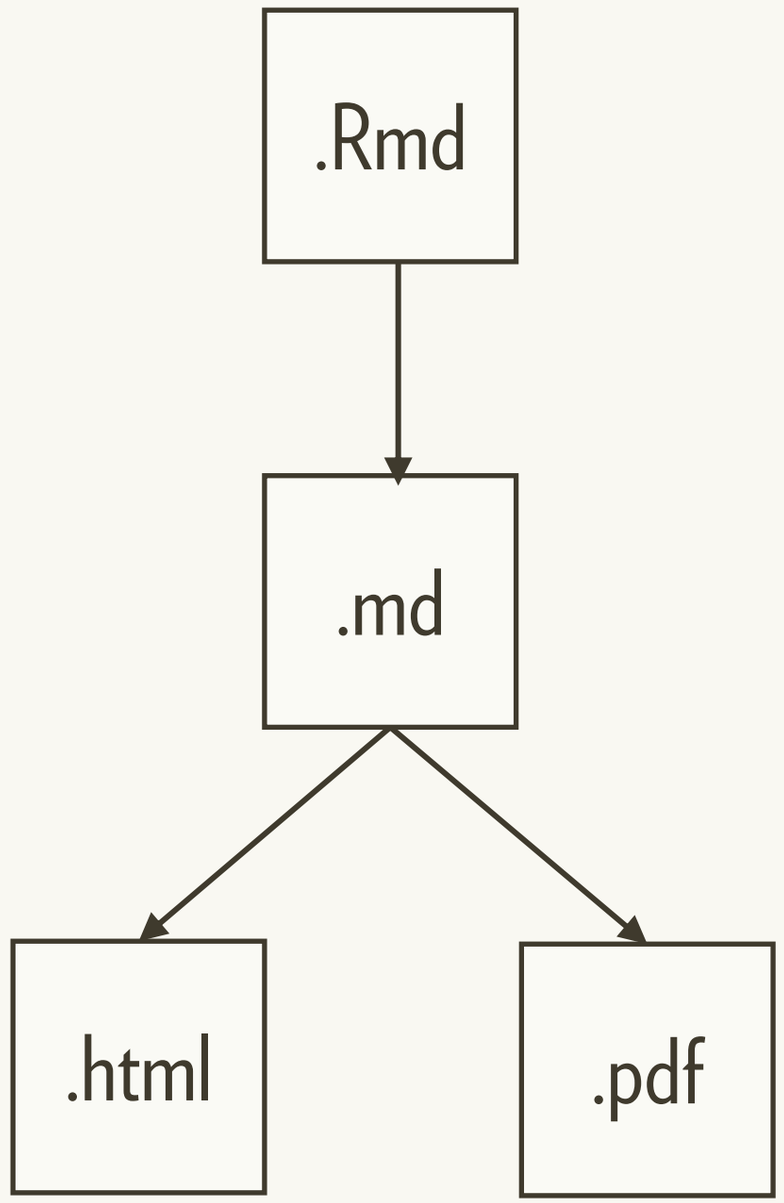
https://github.com/forwards/workshops/

Function-level with roxygen2



Package-level with rmarkdown

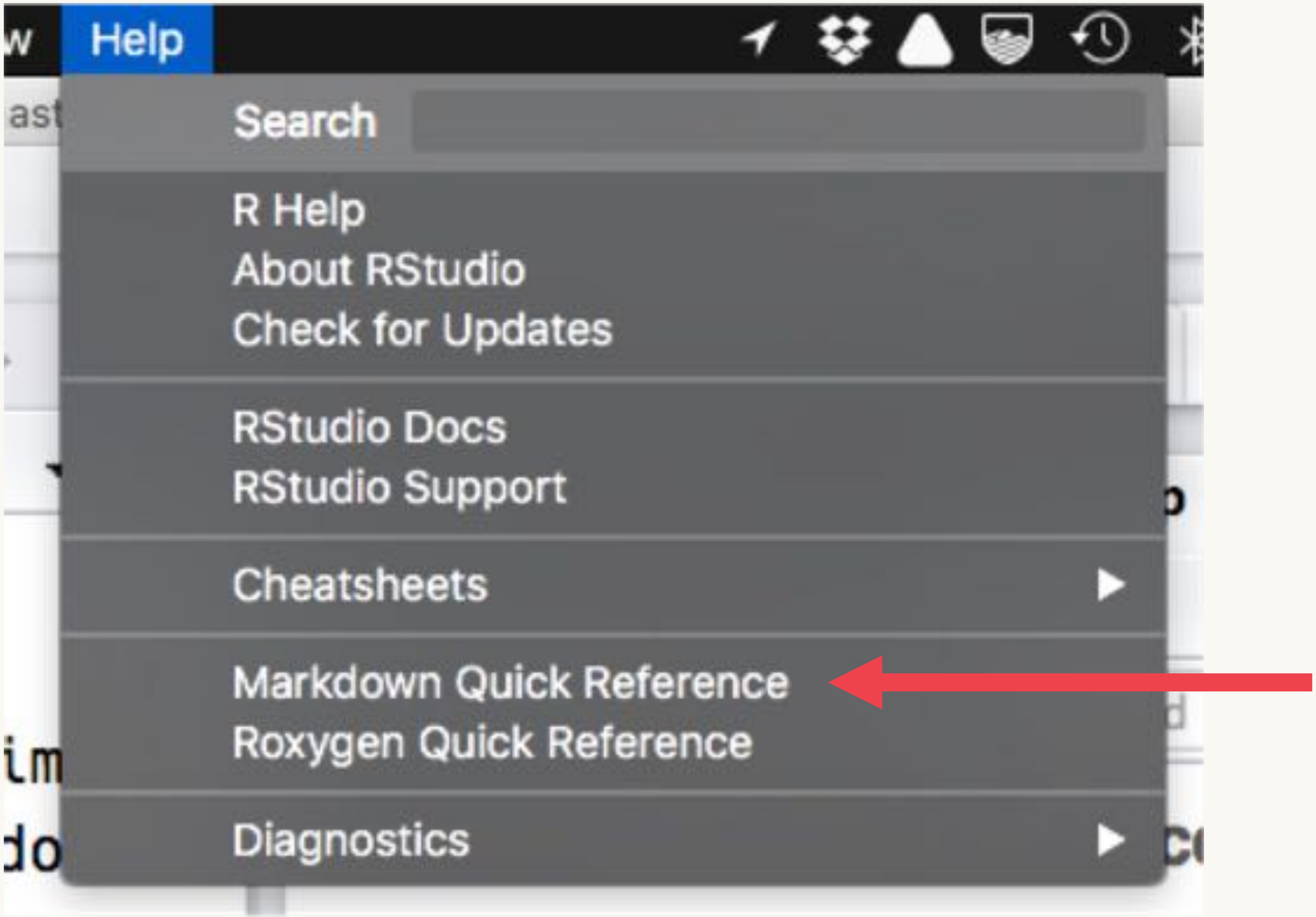


Markdown

I assume you are already familiar with it

Basic markdown formatting

````
# This is a top level heading

This is some text. Make text _italic_ with single  underscores
(or stars). Make it **bold** with double stars (or underscores).
Here is a [link to a markdown guide](http://bit.ly/19fAexE).

* This is a list
* This is another item

```R
# Some R code
f <- function() x + 1
```

## This is a secondary heading

You can also do `inline code`, numbered lists and quotes and
more.
````


Help
Search
R Help
About RStudio
Check for Updates
RStudio Docs
RStudio Support
Cheatsheets
Markdown Quick Reference
Roxygen Quick Reference
Diagnostics

Function documentation with roxygen2

Roxygen2

http://r-pkgs.had.co.nz/man.html

You write specially formatted comments in .R

```
#' Add a Column to a Data Frame
#'
#' Allows you to specify the position. Will replace existing variable
#' with the same name if present.
#'
#' @param x A data frame
#' @param name Name of variable to create. If a variable of that name
#'   already exists it will be replaced
#' @param value Values to insert.
#' @param where Position to insert. Use 1 to insert on LHS, or -1 to
insert on
#'   RHS.
#' @examples
#' df <- data.frame(x = 1:5)
#' add_col(df, "y", runif(5))
#' add_col(df, "y", runif(5), where = 1)
#'
#' add_col(df, "x", 5:1)
```

You write specially formatted comments in .R

```
#' A                                    a Frame
#'
#' Allows you to specify the position. Will replace existing variable
#' with the same name if present.
#'
#' @param x
#' @param n                            riable to create. If a variable of that name
#'   already exists it will be replaced
#' @param value Values to insert.
#' @param where Position to insert. Use 1 to insert on LHS, or -1 to
insert on
#'   RHS.
#' @examples
#' df <- data.frame(x = 1:5)
#' add_col(df, "y", runif(5))
#' add_col(df, "y", runif(5), where = 1)
#'
#' add_col(df, "x", 5:1)
```

Roxygen comment

Roxygen tag

Roxygen translates to .Rd

In almost all cases you can ignore these files

```
% Generated by roxygen2: do not edit by hand
% Please edit documentation in R/add_col.R
\name{add_col}
\alias{add_col}
\title{Add a Column to a Data Frame}
\usage{
add_col(x, name, value, where = -1)
}
\arguments{
\item{x}{A data frame}

\item{name}{Name of variable to create. If a variable of that name
already exists it will be replaced}

\item{value}{Values to insert.}

\item{where}{Position to insert. Use 1 to insert on LHS, or -1 to insert on
RHS.}
}
\description{
Allows you to specify the position. Will replace existing variable
with the same name if present.
}
```

add_col {hadcol}

R translates to .html for viewing

Add a Column to a Data Frame

Description

Allows you to specify the position. Will replace existing variable with the same name if present.

Usage

```
add_col(x, name, value, where = -1)
```

Arguments

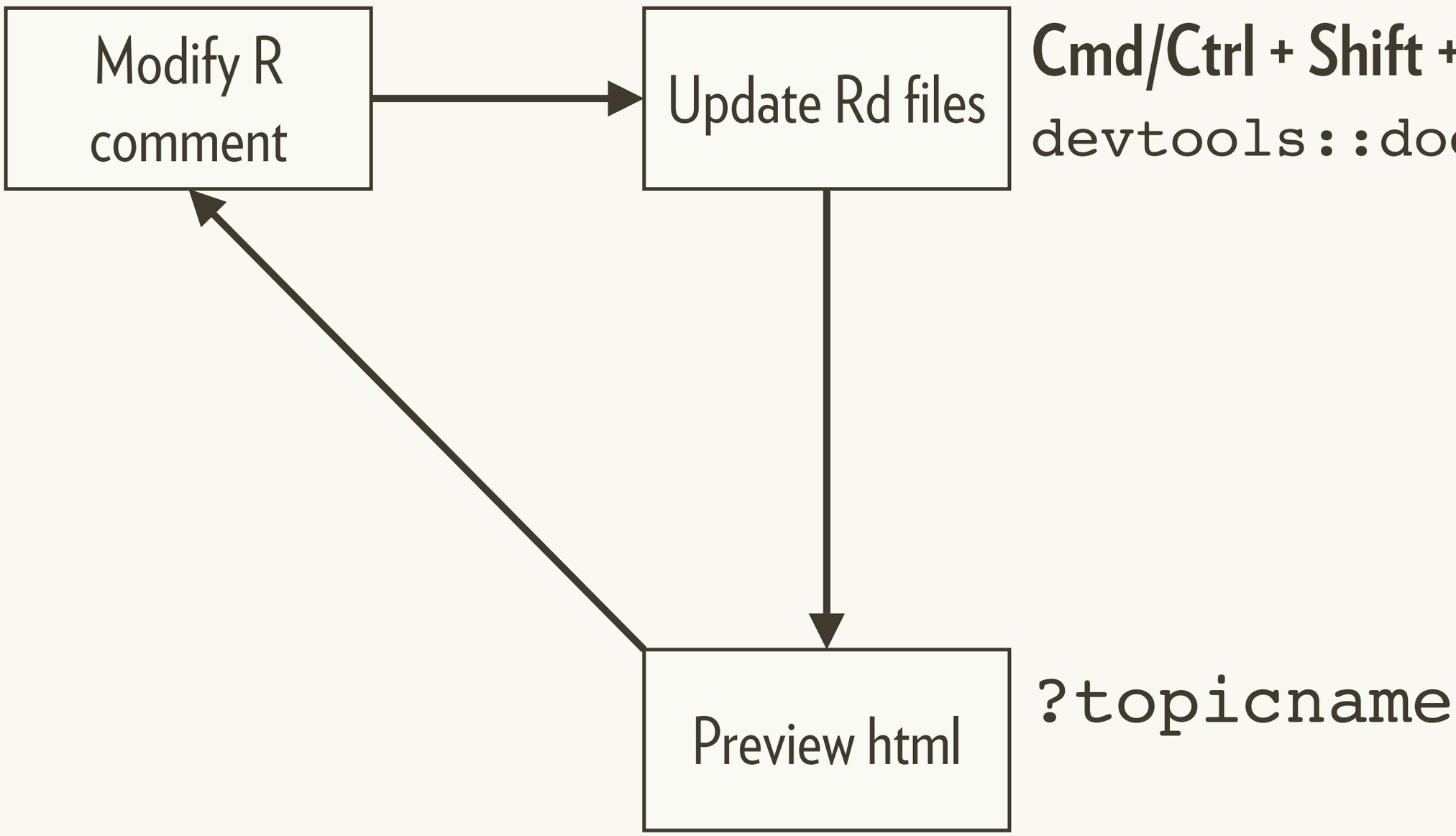
`x`	A data frame
`name`	Name of variable to create. If a variable of that name already exists it will be replaced
`value`	Values to insert.
`where`	Position to insert. Use 1 to insert on LHS, or -1 to insert on RHS.

Examples

```
df <- data.frame(x = 1:5)
add_col(df, "y", runif(5))
add_col(df, "y", runif(5), where = 1)

add_col(df, "x", 5:1)
```

[Package *hadcol* version 0.0.0.9000]

Documentation workflow



Cmd/Ctrl + Shift + D

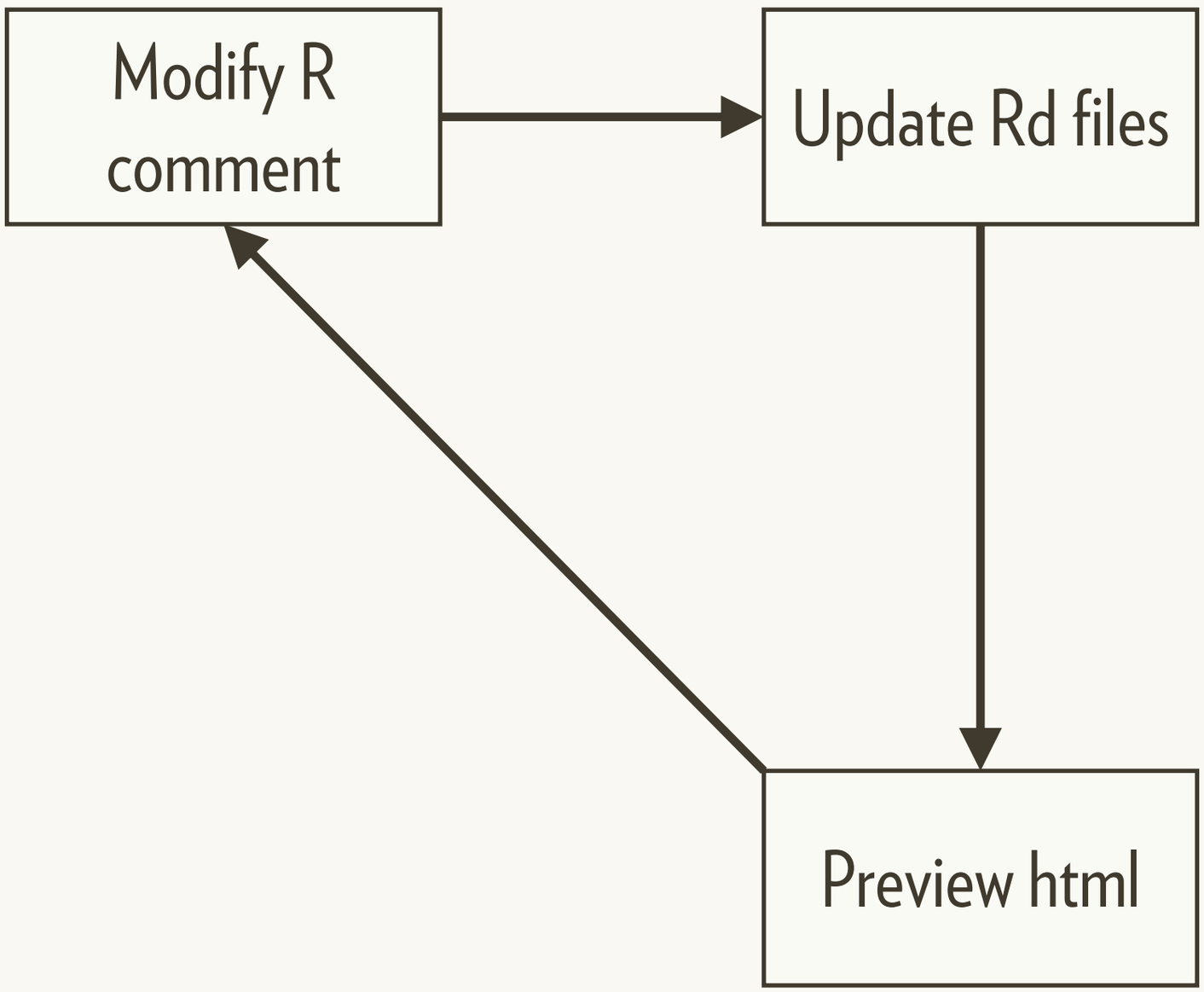
`devtools::document()`

`?topicname`

Two caveats

1. You must have loaded the package with `load_all()` at least once.
   Check for message "Using development documentation..."
2. This technique only builds individual files so links do not work.

Documentation workflow



Cmd/Ctrl + Shift + D

`devtools::document()`

NB: You must have loaded the package with `load_all()` at least once

`?topicname`

Only shows single file, so links do not work

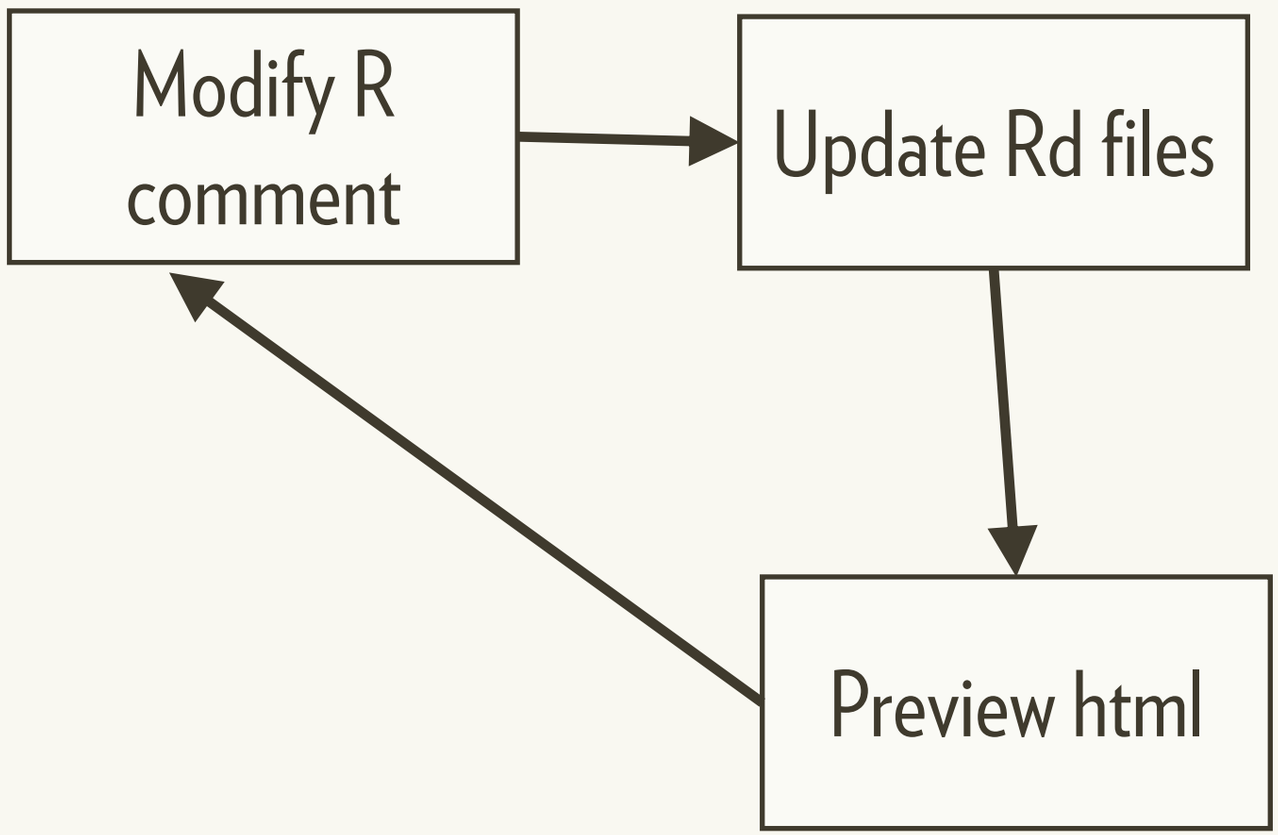
Change working directory/project to:

[hadcol]

https://github.com/forwards/hadcol

Your turn

- Fix the typos in the documentation for `add_col`.
- Run the documentation workflow to check your work



Cmd/Ctrl + Shift + D

`devtools::document()`

NB: You must have loaded the package with `load_all()` at least once

`?topicname`

Only shows single file, so links do not work

R: Sum of Vector Elements

First sentence is the **title**

R Documentation

Sum of Vector Elements

Description

`sum` returns the sum of all the values present in its arguments.

Next paragraph is the **description**

Usage

```
sum(..., na.rm = FALSE)
```

Arguments

`...`	numeric or complex or logical vectors.
`na.rm`	logical. Should missing values (including `NaN`) be removed?

Details

Everything else is the **details**

ectly or via the `Summary` group
ld be unnamed, and dispatch is

If `na.rm` is `FALSE` an `NA` or `NaN` value in any of the arguments will cause a value of `NA` or

The description block

First sentence is the **title**

Next paragraph is the **description**

```
#' Sum of vector elements
#'
#' \code{sum} returns the sum of all the values present in its arguments.
#'
#' This is a generic function: methods can be defined for it directly or via the
#' \code{\link{Summary}} group generic. For this to work properly, the arguments
#' \code{...} should be unnamed, and dispatch is on the first argument.
```

Everything else is the **details**

There are five tags you'll use for most functions

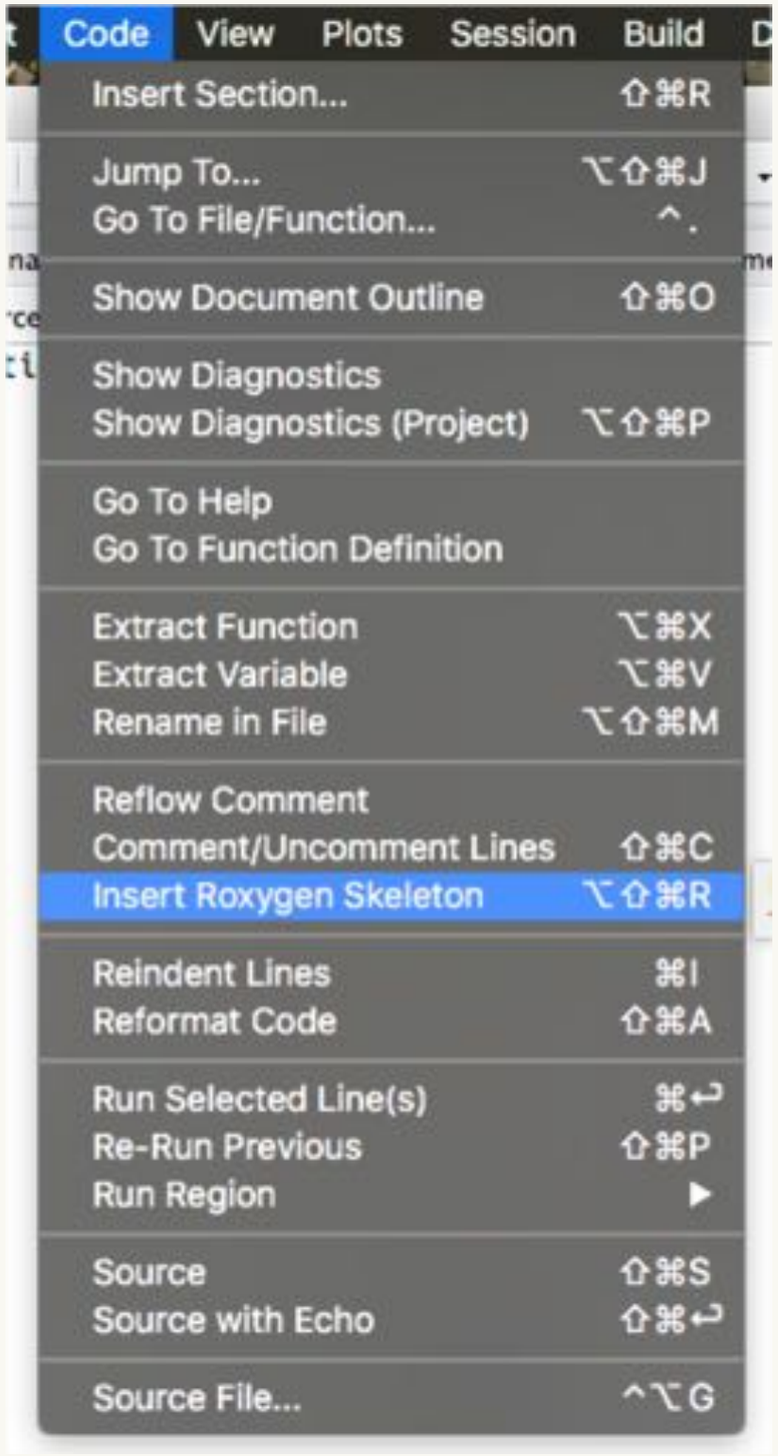
Tag	Purpose
`@param arg`	Describe inputs
`@examples`	Show how the function works. (Usual RStudio shortcuts work)
`@seealso`	Pointers to related functions
`@return`	Describe outputs (value)
`@export`	Is this a user-visible function?

Your turn

Document `add_cols()`.

(See next slide for hint)

RStudio helps you remember

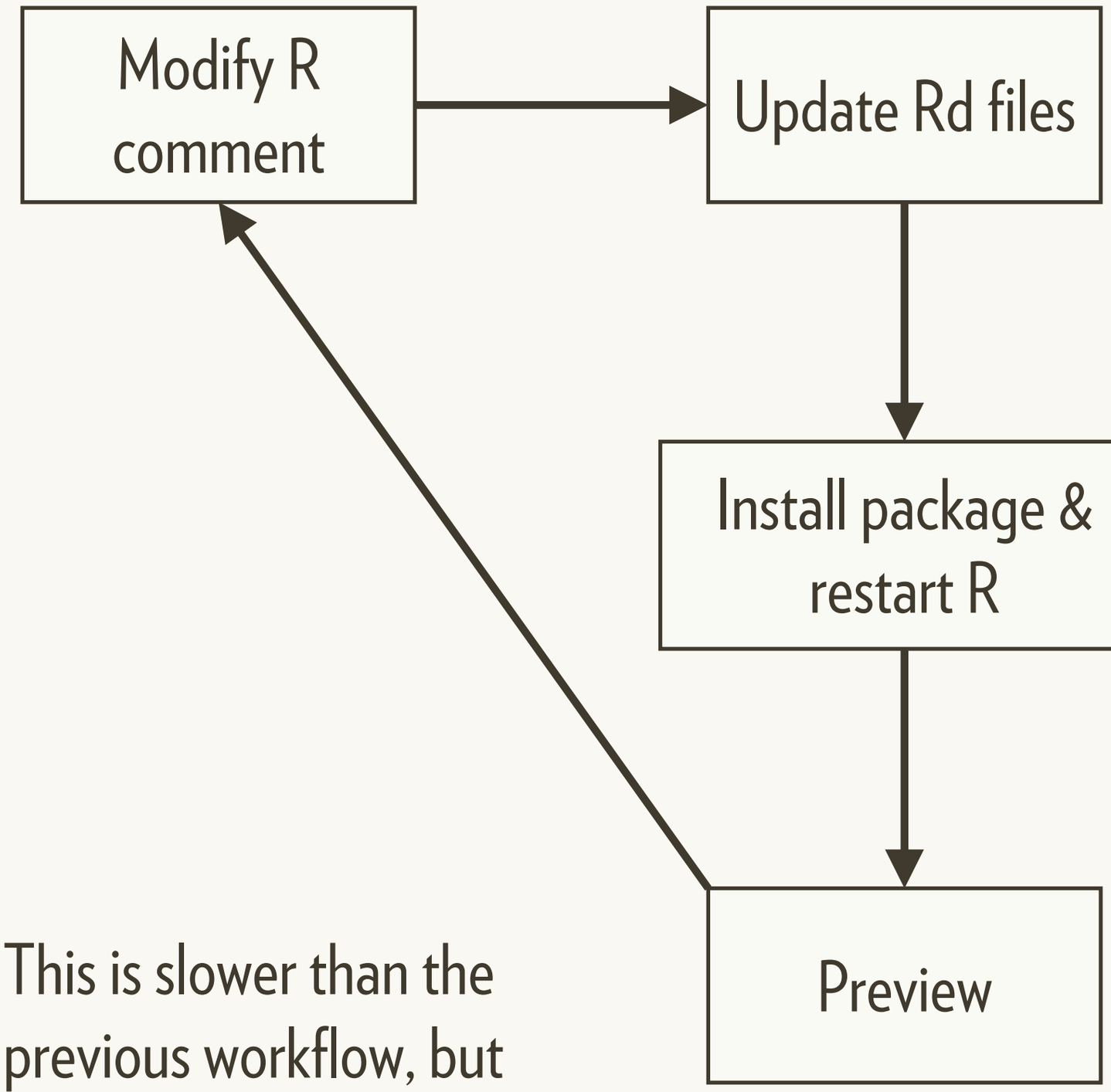



```
#' Title
#'
#' @param x
#' @param y
#' @param z
#'
#' @return
#' @export
#'
#' @examples
fun <- function(x, y, z) {

}
```

Use markdown for formatting

```
# Activate by running
# use_roxygen_md()

**bold**,  italic , `code`

* [func()]
* [pkg::func()]
* [link text][func()]
* [link text][pkg::func()]
```

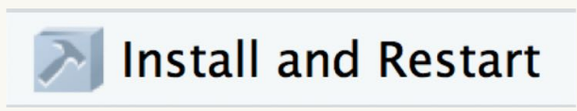
Documentation workflow 2



Cmd/Ctrl + Shift + D

`devtools::document()`

Cmd/Ctrl + Shift + B



`?topicname`

This is slower than the previous workflow, but there are fewer caveats

Your turn

- Make real link to `cbind()`
- Add a see also section (`@seealso`) to `add_col()` and `add_cols()` that links them together.
- What happens if you add `@family xyz` to both?

roxygen2 comes with other tools to reduce duplication

```
# Document multiple functions in the same file
#' @rdname add_col

# Inherit the parameter descriptions from
# another function
#' @inheritParams add_col

# Inherit everything from another topic
#' @inherit add_col

# Inherit selectively
#' @inherit add_col parameters return references
#'   title description details
#'   sections seealso
```

Read online about how to document other objects

Data

http://r-pkgs.had.co.nz/data.html#documenting-data

Classes & methods

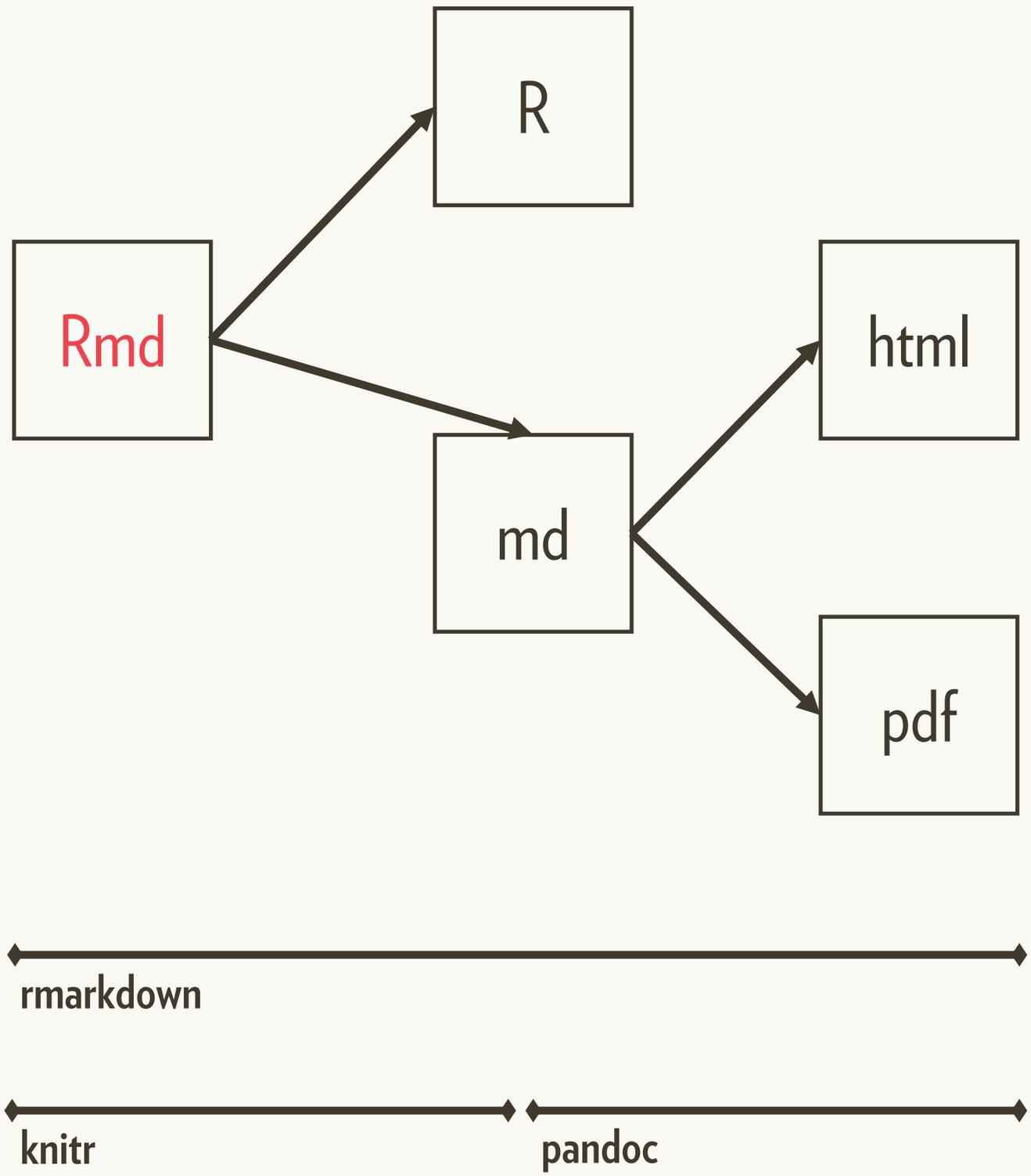
http://r-pkgs.had.co.nz/man.html#man-classes

Packages

http://r-pkgs.had.co.nz/man.html#man-packages

Package documentation with rmarkdown

Vignettes



Lets you combine prose and code to explain your how you package works.

The hard part is the writing, not the technology!

http://r-pkgs.had.co.nz/vignettes.html

Easiest way to get started is with `use_vignette()`

```
usethis::use_vignette("name")

# Adds to DESCRIPTION
Suggests: knitr
VignetteBuilder: knitr

# Creates vignettes/
# Drafts vignettes/name.Rmd
```

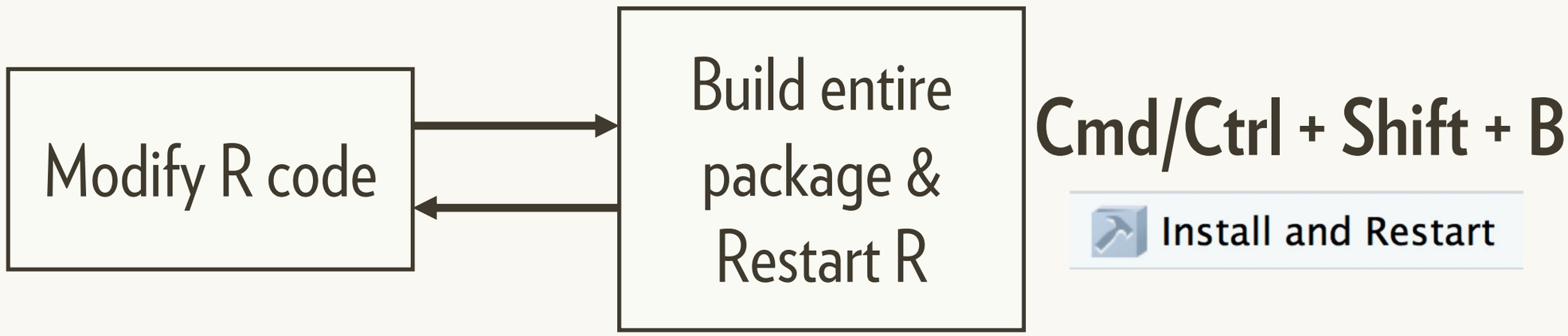
Vignette = Rmarkdown + special metadata

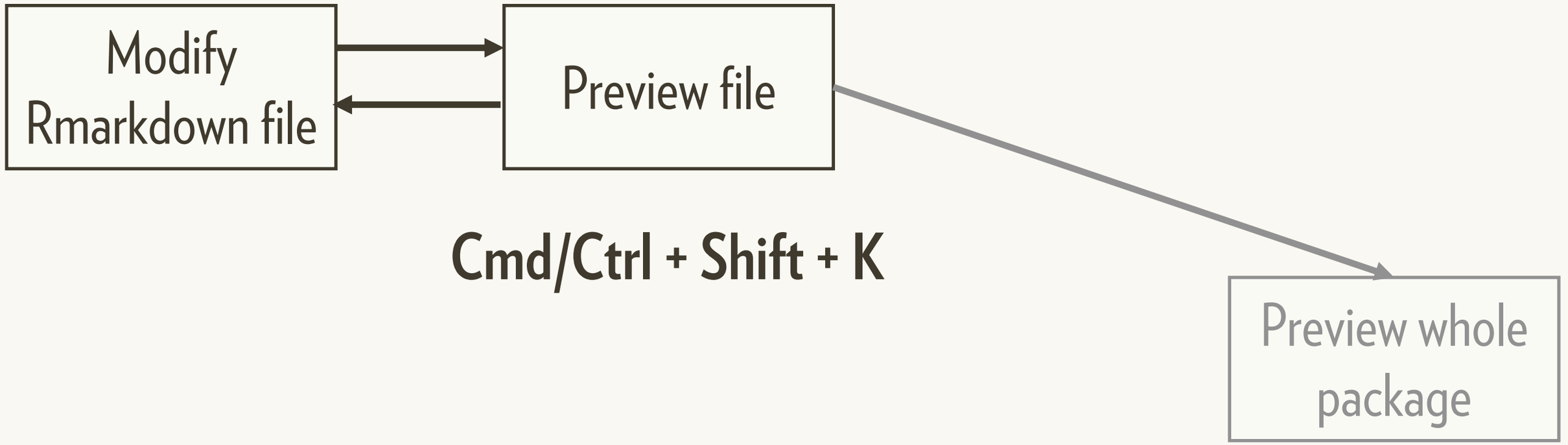
```
---
title: "Vignette Title"
author: "Vignette author"
date: "`r Sys.Date()`"
output: rmarkdown::html_vignette
vignette: >
  %\VignetteIndexEntry{Vignette Title}
  %\VignetteEngine{knitr::rmarkdown}
  %\VignetteEncoding{UTF-8}
---

Vignettes are long form documentation commonly included in packages. Because
they are part of the distribution of the package, they need to be as compact
as possible. The `html_vignette` output type provides a custom style sheet
(and tweaks some options) to ensure that the resulting html is as small as
possible. The `html_vignette` format:

...
```

Special output format for vignettes

Special metadata needed by R

Vignette workflow






```
devtools::install(build_vignettes = TRUE)

browseVignettes()
```

Your turn

Create a vignette that shows how to use `add_col()` for adding and removing.

Fix the "vignette title"

README

If sharing with others, include a readme

```
# Your choice: but often useful to include
# results of running code
usethis::use_readme_md()
usethis::use_readme_rmd()

# For public projects this should include a
# brief overview, instructions on how to
# install, and a few examples. For private
# projects, this is a great place to jot down
# notes
```

NEWS

Also good idea to track changes

```
usethis::use_news_md()
```

Package website with pkgdown

Build a Website

```
pkgdown::build_site()
```

http://pkgdown.r-lib.org/

Home page with "home" icon:

- automatically generated from one of the following four files: index.Rmd; README.Rmd; index.md; README.md

Reference:

- The function reference generates one page for each .Rd file in man/, by default generate an overall index, which is an alphabetically ordered list of functions.

If the files are available in the package:

Articles:

- automatically build the .Rmd vignettes

News:

- if NEWS.md is present

Get Started

- if you have an article with the same name as the package.

A link to your your github repo (if listed in the DESCRIPTION url field).

More options are available!