

# Creating an R Bookdown

Dr. Villanes

# What is bookdown?

**The bookdown package is a free and open-source R package built on top of R Markdown to make it really easy to write books and long-form articles/reports.** Features include:

- Generate printer-ready books and ebooks from R Markdown documents.
- A markup language easier to learn than LaTeX, and to write elements such as section headers, lists, quotes, figures, tables, and citations.
- Multiple choices of output formats: PDF, LaTeX, HTML, EPUB, and Word.
- Possibility of including dynamic graphics and interactive applications (HTML widgets and Shiny apps).
- Support a wide range of languages: R, C/C++, Python, Fortran, Julia, Shell scripts, and SQL, etc.
- LaTeX equations, theorems, and proofs work for all output formats.
- Can be published to GitHub, bookdown.org, and any web servers.
- Integrated with the RStudio IDE.

Examples

## Table of contents

## Welcome

## 1 Introduction

## Explore

## 2 Introduction

## 3 Data visualisation

## 4 Workflow: basics

## 5 Data transformation

## 6 Workflow: scripts

## 7 Exploratory Data Analysis

## 8 Workflow: projects

## Wrangle

## 9 Introduction

## 10 Tibbles

## 11 Data import

## 12 Tidy data

## 13 Relational data

## 14 Strings

## 15 Factors

## 16 Dates and times

## Program

## 17 Introduction

## 18 Pipes

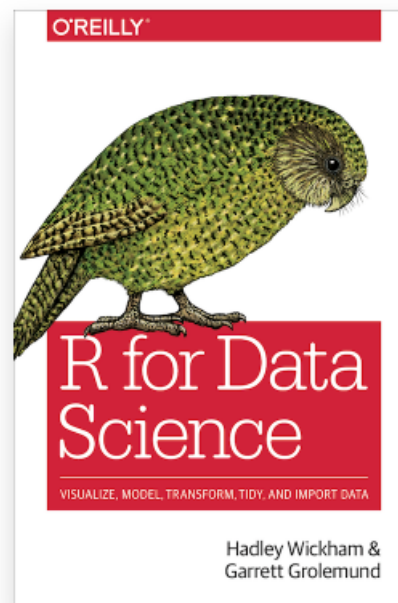
## 19 Functions

# Welcome

This is the website for “**R for Data Science**”. This book will teach you how to do data science with R: You’ll learn how to get your data into R, get it into the most useful structure, transform it, visualise it and model it. In this book, you will find a practicum of skills for data science. Just as a chemist learns how to clean test tubes and stock a lab, you’ll learn how to clean data and draw plots—and many other things besides. These are the skills that allow data science to happen, and here you will find the best practices for doing each of these things with R. You’ll learn how to use the grammar of graphics, literate programming, and reproducible research to save time. You’ll also learn how to manage cognitive resources to facilitate discoveries when wrangling, visualising, and exploring data.

This website is (and will always be) **free to use**, and is licensed under the [Creative Commons Attribution-NonCommercial-NoDerivs 3.0 License](#). If you’d like a **physical copy** of the book, you can order it from [amazon](#); it was published by O’Reilly in January 2017. If you’d like to **give back** please make a donation to [Kākāpō Recovery](#): the [kākāpō](#) (which appears on the cover of R4DS) is a critically endangered native NZ parrot; there are only 213 left.

Please note that R4DS uses a [Contributor Code of Conduct](#). By contributing to this book, you agree to abide by its terms.



## On this page

[Welcome](#)[Acknowledgements](#)[View source](#)[Edit this page](#)

## Preface

[How to read this book](#)[Structure of the book](#)[Software information and convent...](#)[Acknowledgments](#)

## About the Authors

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## 1 Installation

[1.1 Use a Pandoc version not bun...](#)[1.2 Install LaTeX \(TinyTeX\) for PD...](#)[1.3 Install missing LaTeX packages](#)

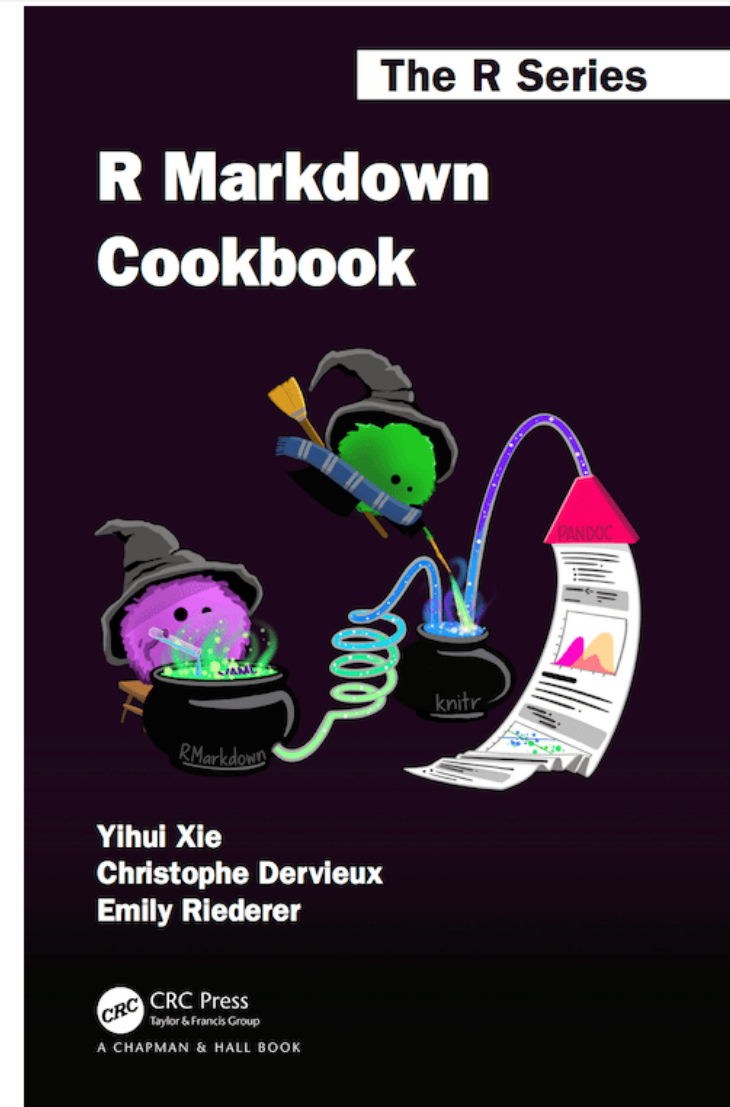
## 2 Conceptual Overview

[2.1 What happens when we render?](#)[2.2 R Markdown anatomy](#)[2.3 What can we change to chang...](#)

## 3 Basics

[3.1 Code chunks and inline R code](#)[3.2 Write Markdown in the RStudi...](#)[3.3 Render an R script to a report](#)[3.4 Convert R Markdown to R script](#)[3.5 R Markdown Notebooks](#)

## 4 Document Elements



R Markdown is a powerful tool for combining analysis and reporting into the same document. Since the birth of the **rmarkdown** package (Allaire, Xie, McPherson, et al. 2021) in early 2014, R Markdown has grown substantially from a package that supports a few output formats, to an extensive and diverse



## Preface

Structure of the book

Acknowledgements

## 1 Introduction to R

1.1 Getting Started

1.2 Variable Assignment

1.3 Finding Variables

1.4 Deleting Variables

## 2 Data Structures

2.1 Vectors

2.2 Lists

2.3 Arrays

2.4 Matrices

2.5 Data Frames

2.6 Working with different types

## 3 Programming Fundamentals

3.1 Logicals

3.2 Conditionals

3.3 Loops

3.4 Functions

## 4 Data Wrangling

## Chapter 1 Introduction to R

### 1.1 Getting Started

The simplest way to use R is to use it as if it were a calculator. For example, if we want to know what one plus one is, you may type:

```
1 + 1
```

We can use any arithmetic operator, like addition, subtraction, multiplication, division, exponentiation, and modulus operations:

```
# addition
1 + 1

# subtraction
6 - 4

# multiplication
2 * 2

# division
10 / 5
10.2 / 5

# integer division
```

How would you use it?



Side project

To document/show all your work.





Interviews!

But most important, case studies/technical assessments.

How to create an R bookdown?

# First, we need a Github account

Open a Github account: <https://education.github.com/students>

This account gives you access to the [Student Developer Pack](#)



#### About Microsoft Azure

Access to Microsoft Azure cloud services and learning resources – no credit card required

#### Benefit

Free access to 25+ Microsoft Azure cloud services plus \$100 in Azure credit.



#### About InterviewCake

Interview Cake makes coding interviews a piece of cake with practice questions, data structures and algorithms reference pages, cheat sheets, and more.

#### Benefit

Access to the full coding interview prep course for 3 weeks.



#### About PomoDone

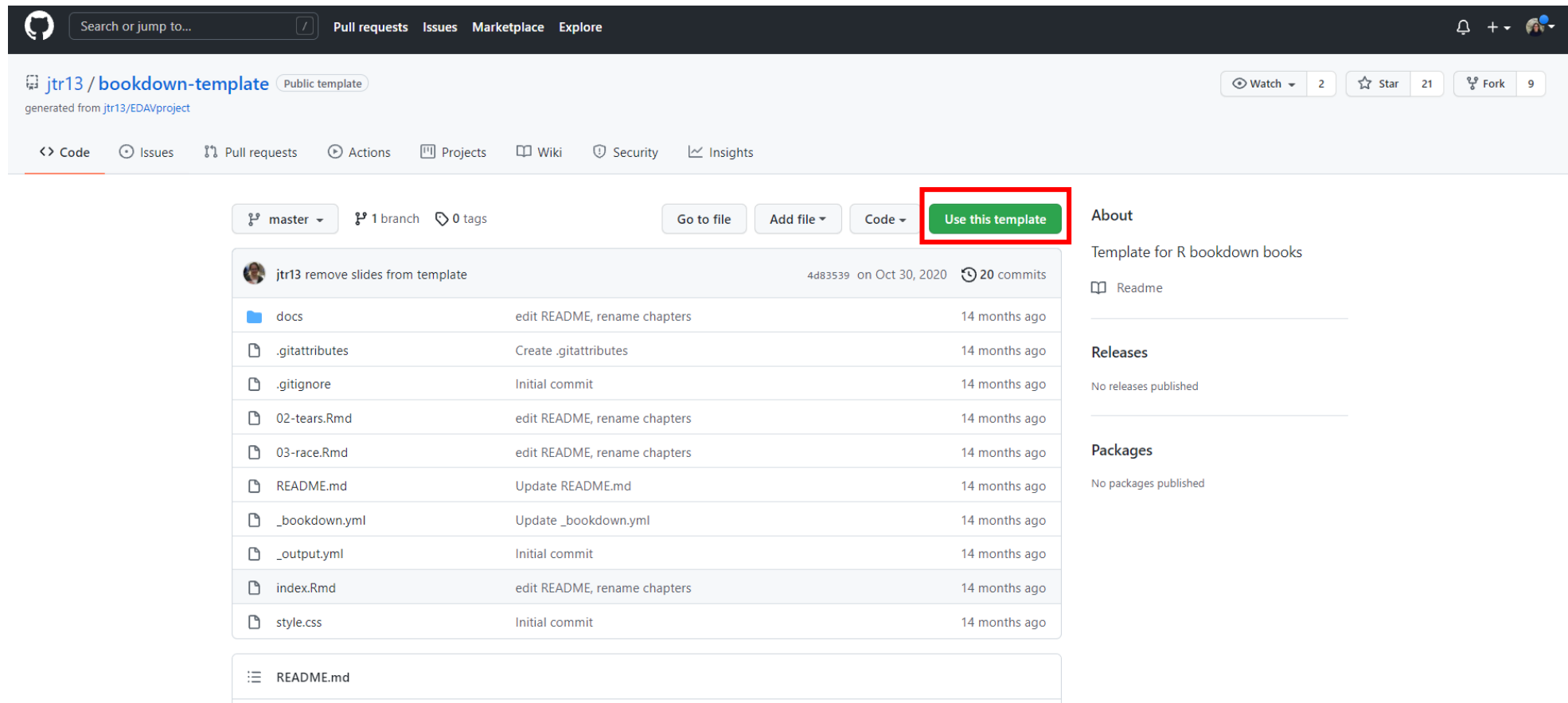
With PomoDone, hack and track your time and boost your productivity by applying Pomodoro technique to your workflow -- eliminate distraction, sharpen focus and prevent burnout.

#### Benefit

PomoDone Lite plan free for 2-years.

# Next, we are going to copy the template repo

Copy this template: <https://github.com/jtr13/bookdown-template>



The screenshot shows the GitHub repository page for `jtr13 / bookdown-template`. The repository is a public template generated from `jtr13/EDAVproject`. It has 2 watchers, 21 stars, and 9 forks. The repository is currently on the `master` branch with 1 branch and 0 tags. The `Use this template` button is highlighted with a red box. The repository contains the following files and folders:

File/Folder	Description	Commit Date
docs	edit README, rename chapters	14 months ago
.gitattributes	Create .gitattributes	14 months ago
.gitignore	Initial commit	14 months ago
02-tears.Rmd	edit README, rename chapters	14 months ago
03-race.Rmd	edit README, rename chapters	14 months ago
README.md	Update README.md	14 months ago
_bookdown.yml	Update _bookdown.yml	14 months ago
_output.yml	Initial commit	14 months ago
index.Rmd	edit README, rename chapters	14 months ago
style.css	Initial commit	14 months ago

The repository is described as a "Template for R bookdown books". It has no releases published and no packages published.

# Enter the details of your repository

## Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere?

[Import a repository.](#)

*Required fields are marked with an asterisk (\*).*

### Repository template

 **jtr13/bookdown-template** ▾

Start your repository with a template repository's contents.

☒ **Include all branches**

Copy all branches from jtr13/bookdown-template and not just the default branch.

Owner \*

 **andreavillanes** ▾

Repository name \*

/

✔ MyFirstBookdown is available.

Great repository names are short and memorable. Need inspiration? How about **bookish-disco** ?

Description (optional)

☒  **Public**

Anyone on the internet can see this repository. You choose who can commit.

☐  **Private**

You choose who can see and commit to this repository.

 You are creating a public repository in your personal account.

Create repository

# Next, we set up Github pages: free way to host your projects

## 1. Click on Settings

The screenshot shows the GitHub interface for the repository 'MyFirstBookdown' by user 'andreavillanes'. The 'Settings' link in the top navigation bar is highlighted with a red box. The repository page displays the following information:

- Repository Name:** MyFirstBookdown (Public)
- Generated from:** [jtr13/bookdown-template](#)
- Navigation Bar:** Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, **Settings** (highlighted).
- Repository Details:** Pin, Unwatch (1), Fork (0), Star (0).
- Branches and Tags:** main (1 branch), 0 tags.
- Files:** docs, .gitattributes, .gitignore, 02-tears.Rmd, 03-race.Rmd, LICENSE, README.md, \_bookdown.yml, \_output.yml, index.Rmd, style.css. All files are from the 'Initial commit' 1 minute ago.
- Commit History:** Initial commit by andreavillanes, commit bf9aaf4, 1 minute ago, 1 commit.
- Right-hand Sidebar:**
  - About:** My first bookdown project. Includes links for Readme, MIT license, Activity, 0 stars, 1 watching, and 0 forks.
  - Releases:** No releases published. [Create a new release](#).
  - Packages:** No packages published. [Publish your first package](#).

# Click on Pages

The screenshot shows the GitHub repository settings page. The top navigation bar includes links for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The left sidebar contains a list of settings categories: General, Access, Collaborators, Moderation options, Code and automation, Branches, Tags, Rules, Actions, Webhooks, Environments, Codespaces, Pages (highlighted with a red box), Security, Code security and analysis, Deploy keys, and Secrets and variables. The main content area is titled 'GitHub Pages' and contains the following sections:

- General:** A description stating that GitHub Pages is designed to host personal, organization, or project pages from a GitHub repository.
- Build and deployment:**
  - Source:** A dropdown menu labeled 'Deploy from a branch'.
  - Branch:** A message stating 'GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more about configuring the publishing source for your site.](#)' Below this message are two buttons: 'None' and 'Save'.
- Visibility:** A section with a 'GITHUB ENTERPRISE' badge. It contains a paragraph explaining that with a GitHub Enterprise account, access to the GitHub Pages site can be restricted by publishing it privately. Below this paragraph is a button that says 'Try GitHub Enterprise risk-free for 30 days' and a link that says 'Learn more about the visibility of your GitHub Pages site'.

# Under Branch, click Master and choose the /docs folder, and Save

## GitHub Pages

[GitHub Pages](#) is designed to host your personal, organization, or project pages from a GitHub repository.


## Build and deployment

### Source

Deploy from a branch ▾

### Branch

GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more about configuring the publishing source for your site.](#)

 main ▾

 /docs ▾

Save

## Visibility

GITHUB ENTERPRISE

With a GitHub Enterprise account, you can restrict access to your GitHub Pages site by publishing it privately. A privately published site can only be accessed by people with read access to the repository the site is published from. You can use privately published sites to share your internal documentation or knowledge base with members of your enterprise.

[Try GitHub Enterprise risk-free for 30 days](#)

[Learn more about the visibility of your GitHub Pages site](#)




Refresh like a crazy person...

# We get a URL that tells us where the site will be published.

## GitHub Pages

[GitHub Pages](#) is designed to host your personal, organization, or project pages from a GitHub repository.

Your site is live at <https://andreavillanes.github.io/MyFirstBookdown/>  
Last [deployed](#) by  [andreavillanes](#) 1 minute ago

[Visit site](#)

...


## Build and deployment

### Source

Deploy from a branch ▾

### Branch

Your GitHub Pages site is currently being built from the `/docs` folder in the `main` branch. [Learn more about configuring the publishing source for your site.](#)

 `main` ▾

 `/docs` ▾

Save

Learn how to [add a Jekyll theme](#) to your site.

Your site was last deployed to the [github-pages](#) environment by the [pages build and deployment](#) workflow. [Learn more about deploying to GitHub Pages using custom workflows](#)

... notice it doesn't work yet. Let that bake.

# Go back to the repo

- Paste the link of the URL to the About section

The screenshot shows a GitHub repository named 'MyFirstBookdown' by user 'andreavillanes'. The repository is public and was generated from 'jtr13/bookdown-template'. It has 1 branch (main), 0 tags, and 0 forks. The 'About' section is highlighted with a red box and contains the text 'My first bookdown project' and a link to 'andreavillanes.github.io/MyFirstBookdo...'. The 'Releases' section shows 'No releases published' with a link to 'Create a new release'. The 'Packages' section shows 'No packages published'. The file list includes 'docs', '.gitattributes', '.gitignore', '02-tears.Rmd', '03-race.Rmd', 'LICENSE', 'README.md', '\_bookdown.yml', '\_output.yml', 'index.Rmd', and 'style.css', all from the initial commit 6 minutes ago.

**MyFirstBookdown** Public  
generated from [jtr13/bookdown-template](https://github.com/jtr13/bookdown-template)

Pin Unwatch 1 Fork 0 Star 0

main 1 branch 0 tags Go to file Add file <> Code

**andreavillanes** Initial commit ✓ bf9aaf4 6 minutes ago 1 commit

File	Commit	Time
docs	Initial commit	6 minutes ago
.gitattributes	Initial commit	6 minutes ago
.gitignore	Initial commit	6 minutes ago
02-tears.Rmd	Initial commit	6 minutes ago
03-race.Rmd	Initial commit	6 minutes ago
LICENSE	Initial commit	6 minutes ago
README.md	Initial commit	6 minutes ago
_bookdown.yml	Initial commit	6 minutes ago
_output.yml	Initial commit	6 minutes ago
index.Rmd	Initial commit	6 minutes ago
style.css	Initial commit	6 minutes ago

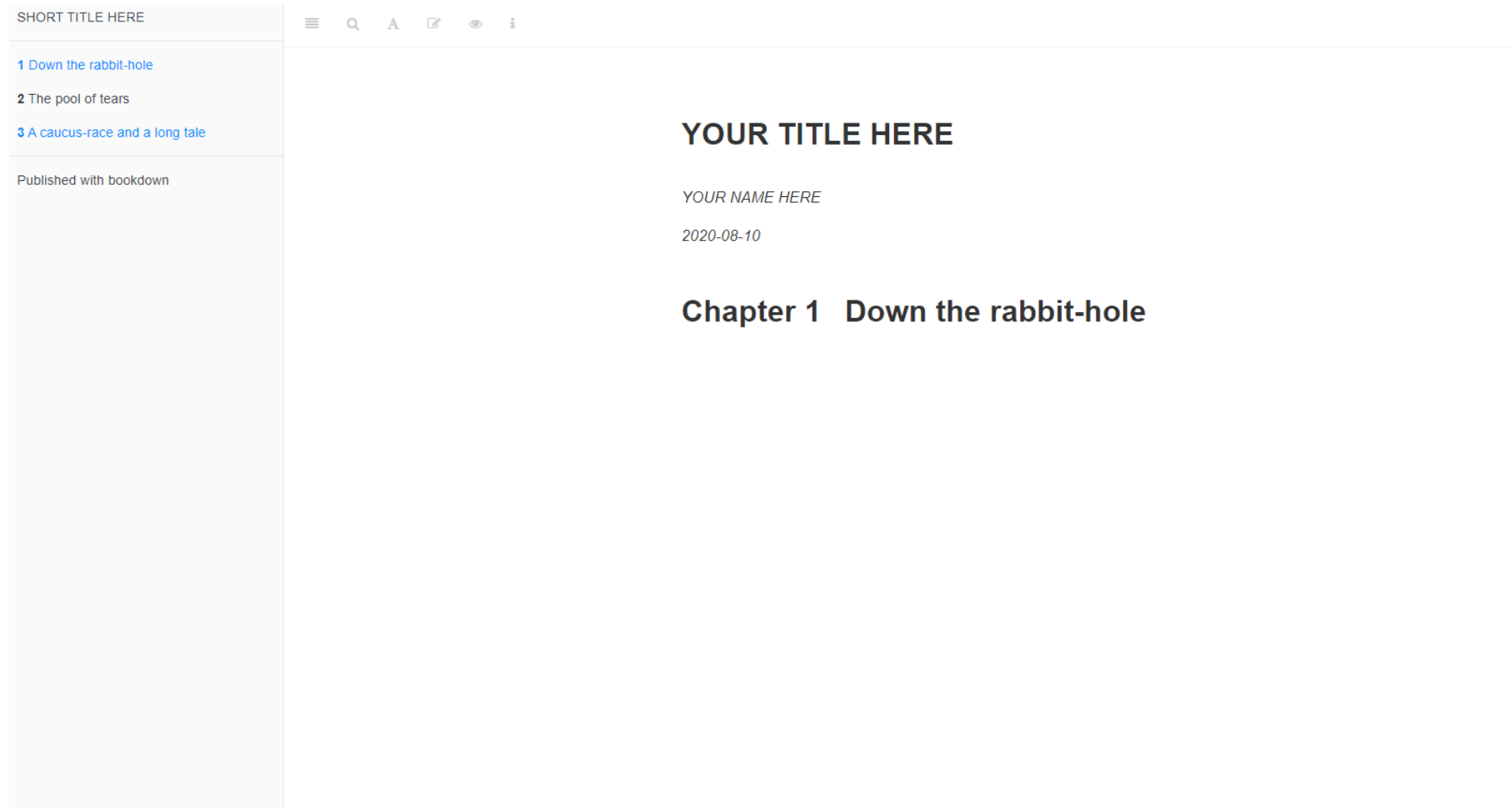
**About** ⚙️  
My first bookdown project  
[andrevillanes.github.io/MyFirstBookdo...](https://andreavillanes.github.io/MyFirstBookdo...)

Readme  
MIT license  
Activity  
0 stars  
1 watching  
0 forks

**Releases**  
No releases published  
[Create a new release](#)

**Packages**  
No packages published

# Click on the URL, and you will see the site published

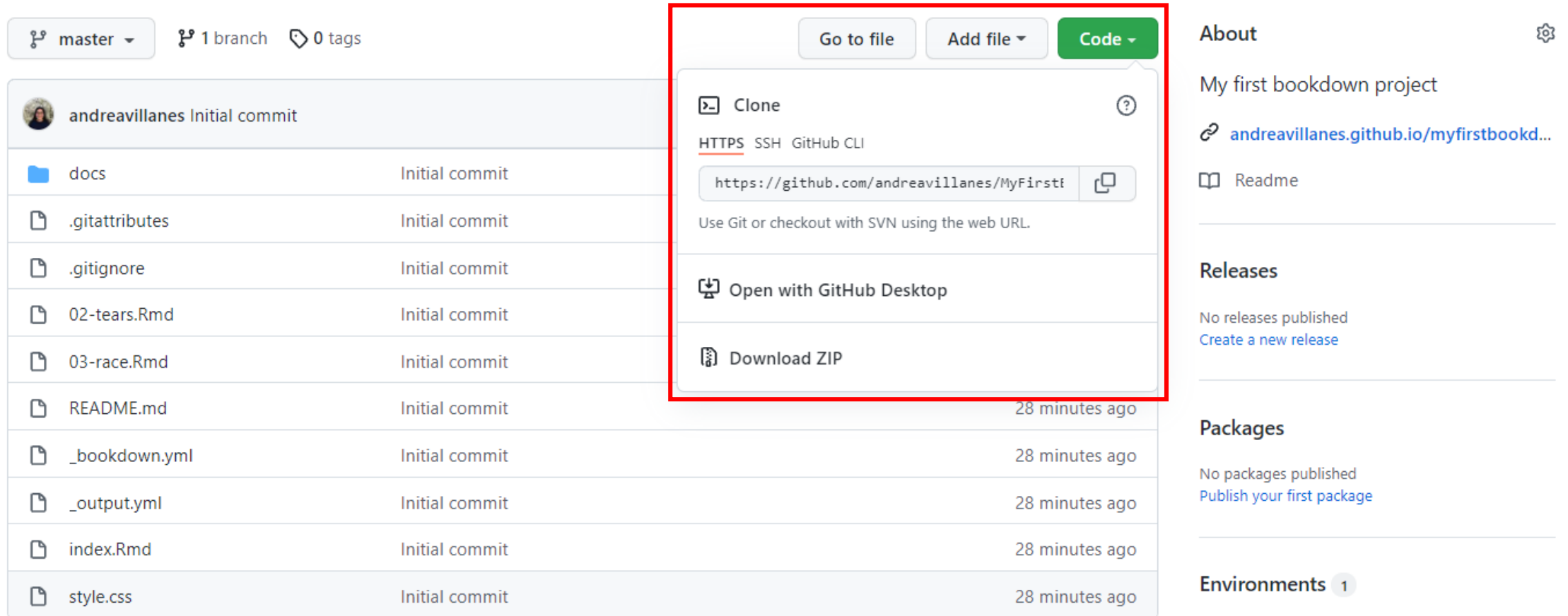


Now, we modify the site.

How? – We clone the repo and make the changes. We are pulling down a full copy of all the repository data that GitHub has at that point in time.

# Go back to the repo

- Click on the Code button and copy the link



The screenshot shows a GitHub repository page for 'My first bookdown project' by user 'andreavillanes'. The repository is on the 'master' branch, has 1 branch, and 0 tags. A file list is shown with the following items:

File Name	Commit	Time
docs	Initial commit	
.gitattributes	Initial commit	
.gitignore	Initial commit	
02-tears.Rmd	Initial commit	
03-race.Rmd	Initial commit	
README.md	Initial commit	28 minutes ago
_bookdown.yml	Initial commit	28 minutes ago
_output.yml	Initial commit	28 minutes ago
index.Rmd	Initial commit	28 minutes ago
style.css	Initial commit	28 minutes ago

The 'Code' button is highlighted with a red box, and its dropdown menu is open, showing the following options:

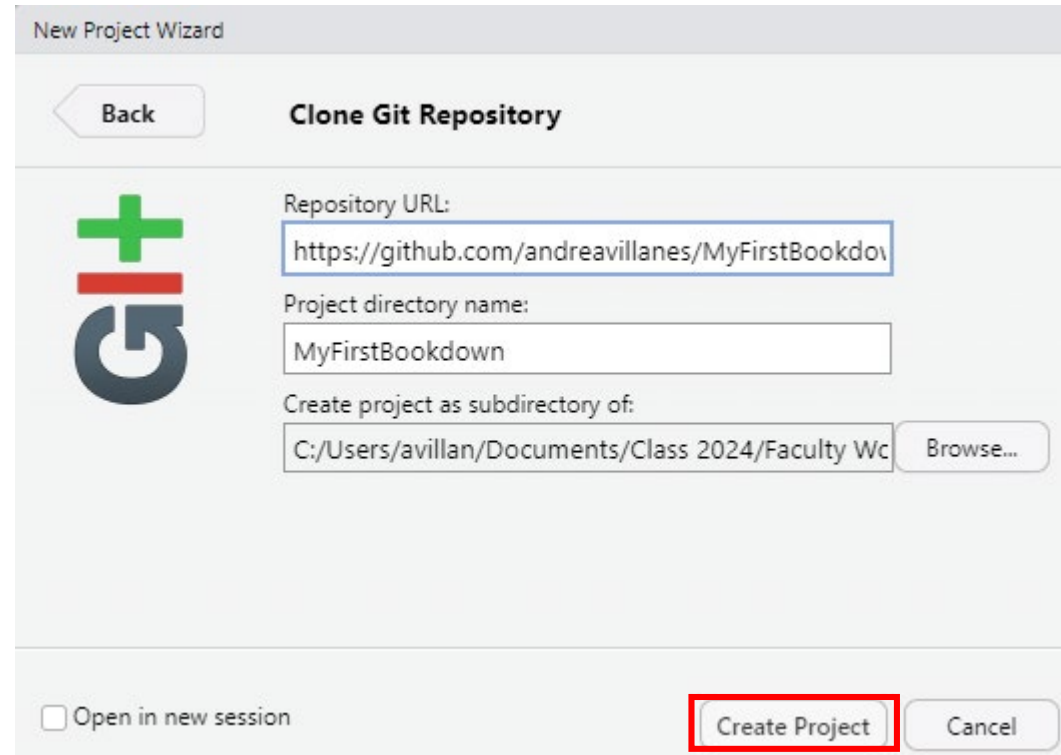
- Clone (with a question mark icon)
  - HTTPS (selected)
  - SSH
  - GitHub CLI
- Open with GitHub Desktop
- Download ZIP

The 'Clone' section shows the URL `https://github.com/andreavillanes/MyFirsti` with a copy icon. Below it, it says 'Use Git or checkout with SVN using the web URL.'

On the right side of the page, there are sections for 'About', 'Releases', 'Packages', and 'Environments'. The 'About' section shows the repository name and a link to the repository. The 'Releases' section shows 'No releases published' and a link to 'Create a new release'. The 'Packages' section shows 'No packages published' and a link to 'Publish your first package'. The 'Environments' section shows '1' environment.

# Open RStudio

- Click on File → New Project → Version Control → Git → Paste the link



The screenshot shows the 'New Project Wizard' dialog box in RStudio, specifically the 'Clone Git Repository' step. The dialog has a title bar 'New Project Wizard' and a 'Back' button. On the left is the Git logo. The main area contains three text input fields: 'Repository URL:' with the value 'https://github.com/andreavillanes/MyFirstBookdown', 'Project directory name:' with the value 'MyFirstBookdown', and 'Create project as subdirectory of:' with the value 'C:/Users/avillan/Documents/Class 2024/Faculty Work'. A 'Browse...' button is next to the last field. At the bottom, there is an unchecked checkbox 'Open in new session', a 'Create Project' button (highlighted with a red rectangle), and a 'Cancel' button.

New Project Wizard

Back Clone Git Repository

Repository URL:  
https://github.com/andreavillanes/MyFirstBookdown

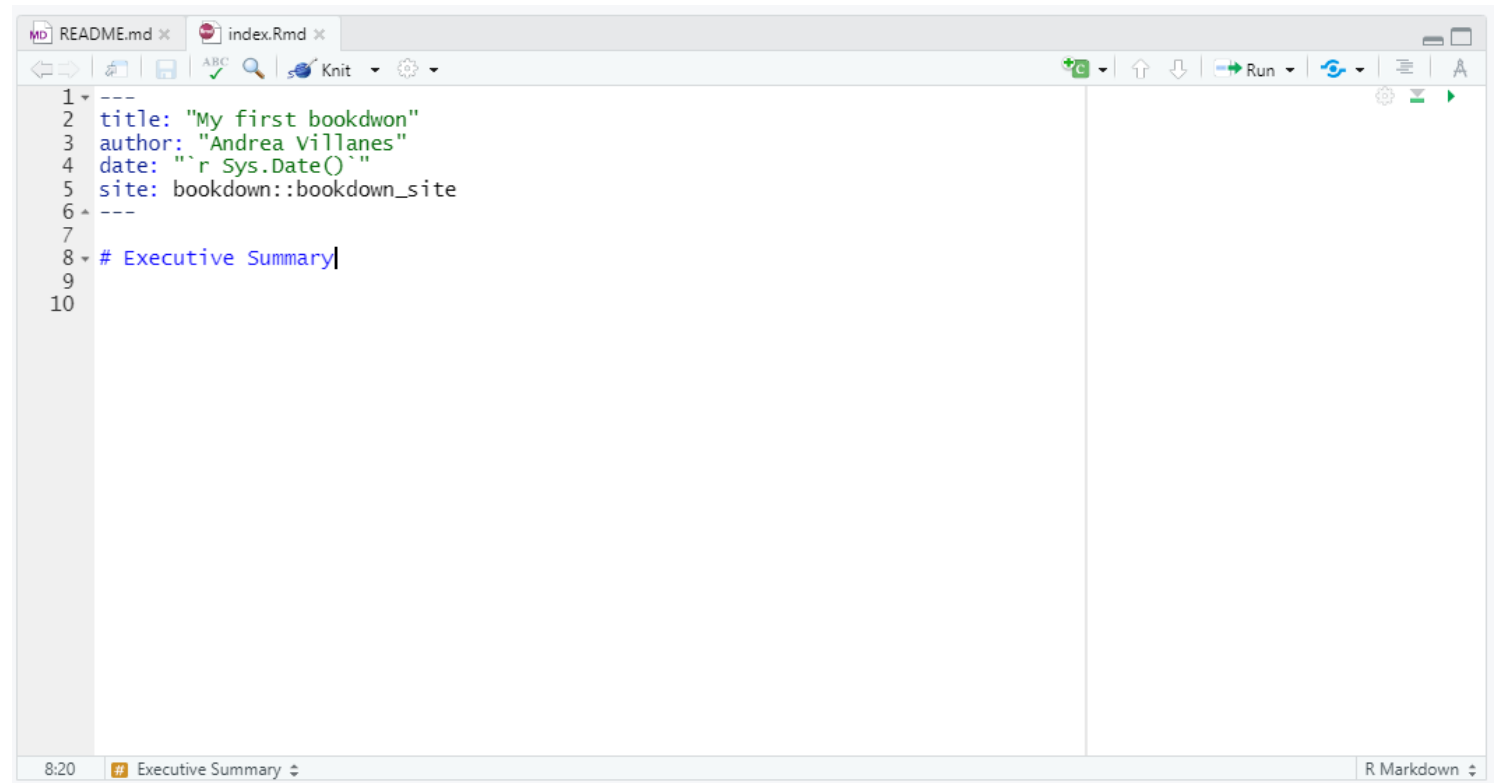
Project directory name:  
MyFirstBookdown

Create project as subdirectory of:  
C:/Users/avillan/Documents/Class 2024/Faculty Work Browse...

☐ Open in new session Create Project Cancel

# Now, the remaining instructions are in the README file

- We have done everything up to: `#### Edit some key files`
- Start editing the `index.Rmd` file
- Save your changes



The screenshot shows the RStudio editor interface with two tabs: 'README.md' and 'index.Rmd'. The 'index.Rmd' tab is active, displaying the following R Markdown code:

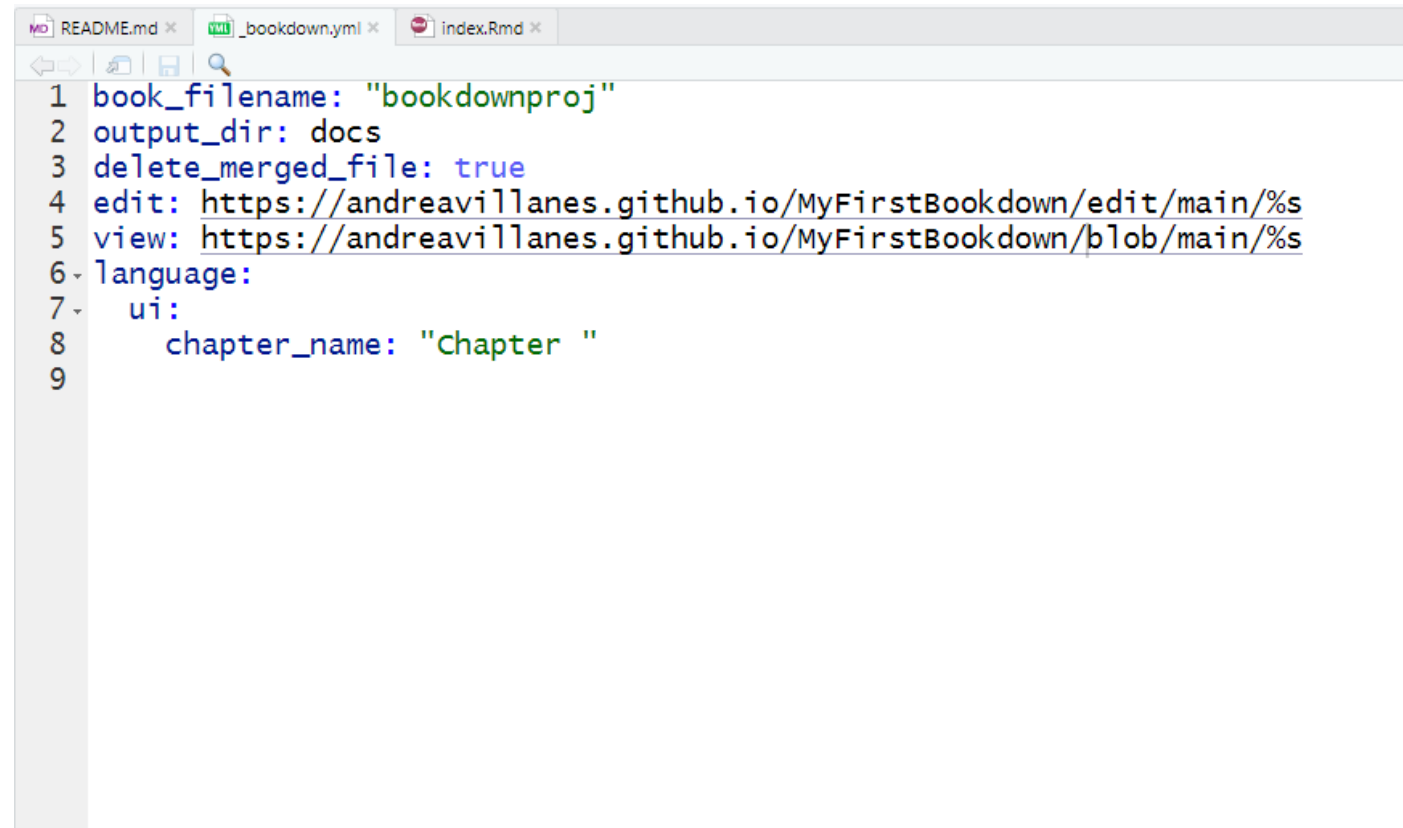
```
1 ---
2 title: "My first bookdwon"
3 author: "Andrea Villanes"
4 date: "`r Sys.Date()"
5 site: bookdown::bookdown_site
6 ---
7
8 # Executive Summary|
9
10
```

The status bar at the bottom indicates the current time is 8:20, the file is 'Executive Summary', and the file type is 'R Markdown'.



# Go to the `_bookdown.yml` file

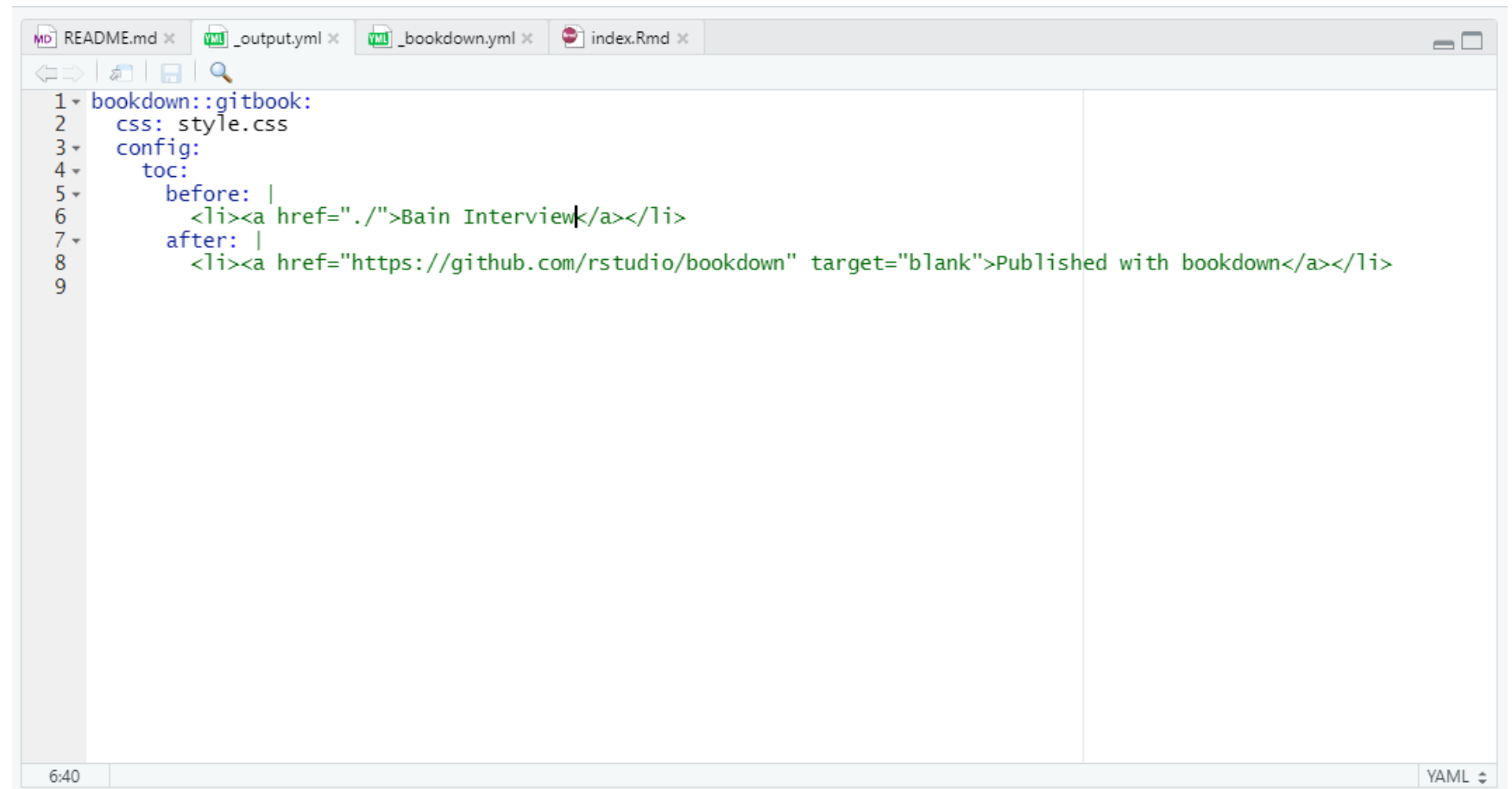
- Enter/edit your github username and repo name, and save the changes

A screenshot of a code editor window with three tabs: 'README.md', '\_bookdown.yml', and 'index.Rmd'. The '\_bookdown.yml' tab is active, showing a YAML configuration file. The file contains the following content:

```
1 book_filename: "bookdownproj"
2 output_dir: docs
3 delete_merged_file: true
4 edit: https://andreavillanes.github.io/MyFirstBookdown/edit/main/%s
5 view: https://andreavillanes.github.io/MyFirstBookdown/blob/main/%s
6 language:
7   ui:
8     chapter_name: "Chapter "
```

# Go to the \_output.yml file

- Edit the Short Title, and save the changes



The screenshot shows an RStudio editor window with four tabs: README.md, \_output.yml (active), \_bookdown.yml, and index.Rmd. The \_output.yml file contains the following YAML configuration:

```
1 bookdown::gitbook:
2   css: style.css
3   config:
4     toc:
5       before: |
6         <li><a href=".">Bain Interview</a></li>
7       after: |
8         <li><a href="https://github.com/rstudio/bookdown" target="blank">Published with bookdown</a></li>
9
```

The status bar at the bottom left shows the time 6:40, and the bottom right shows the file type as YAML.

Time to render the book.

Install `**bookdown**` with  
`install.packages("bookdown")`

# Now, we render the book

1. In the console, enter:

```
bookdown::render_book("index.Rmd")
```

2. View the book locally:

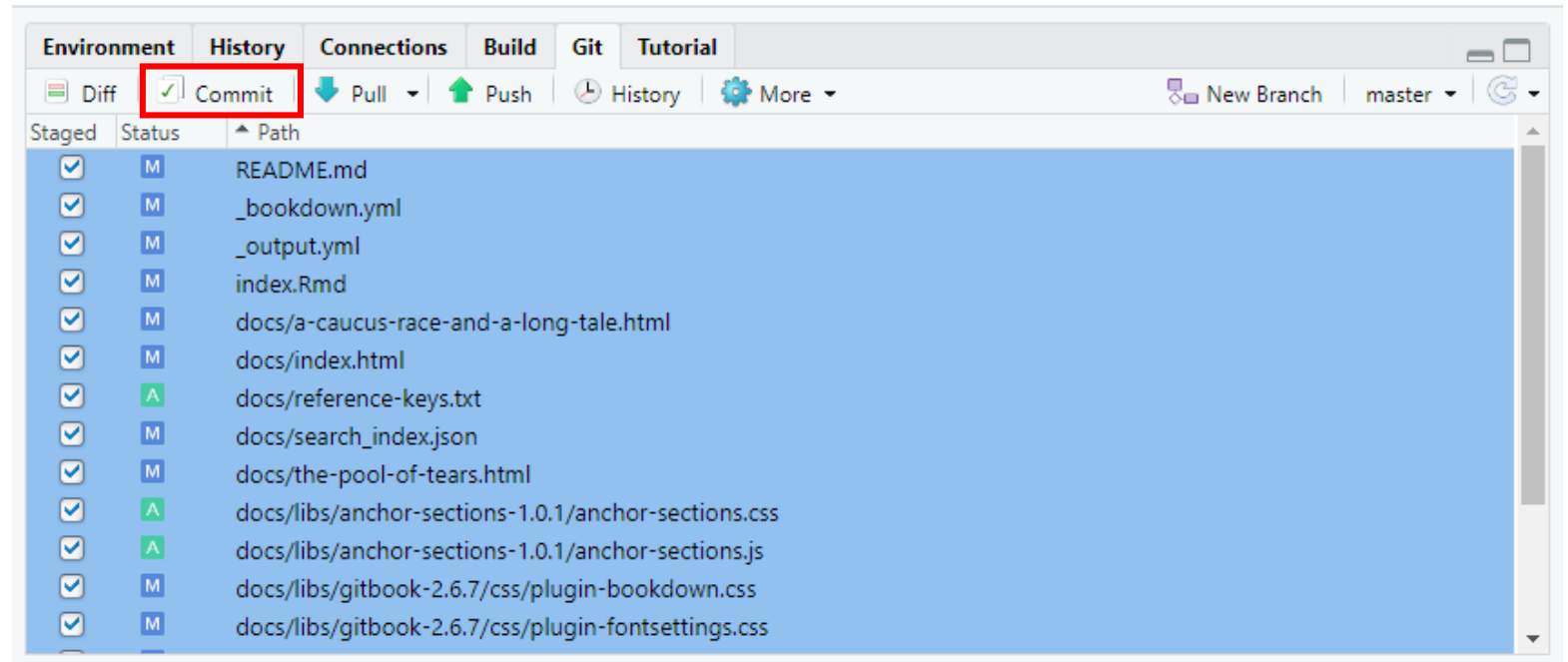
```
browseURL("docs/index.html")
```

3. You will see your local version of the bookdown file.
4. If everything looks good, we can commit and push all those changes

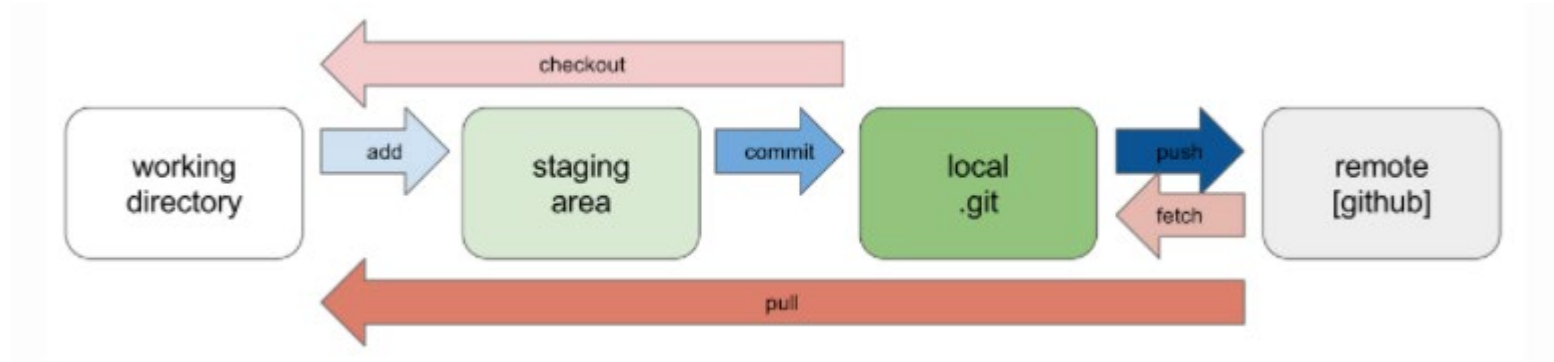
You will need to repeat steps 1 and 4 every time you wish to update the book online

# To commit to changes...

- Go to the Git window
- Control + A to select all the files, and check all the files.
- Click on Commit



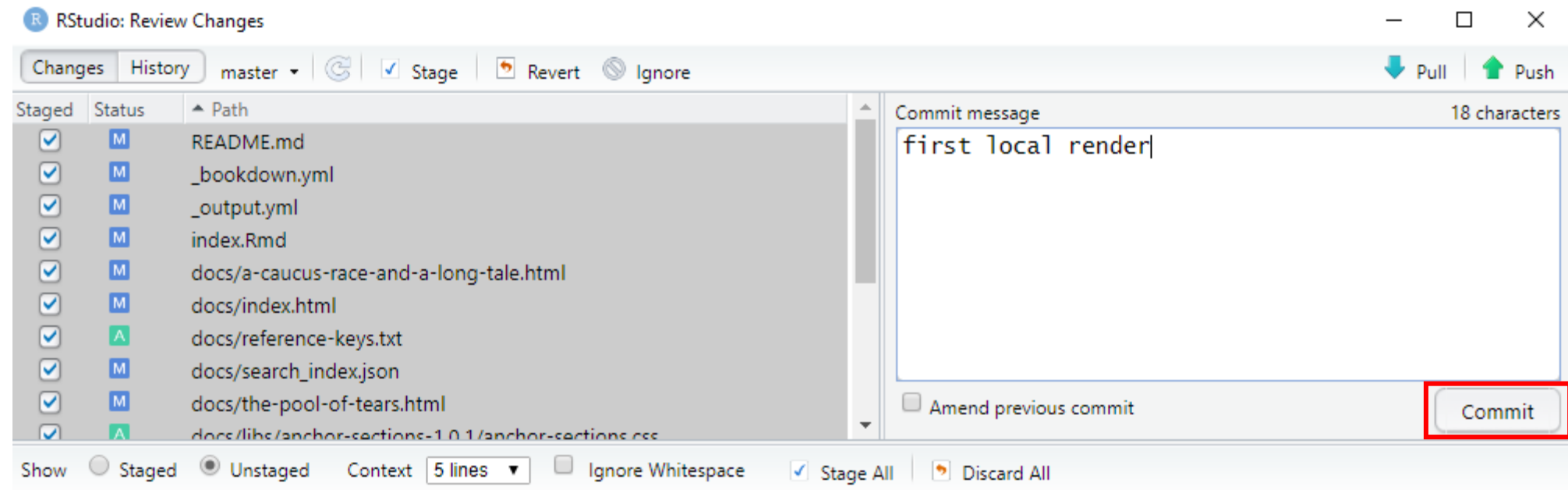
# Basic Git Workflow



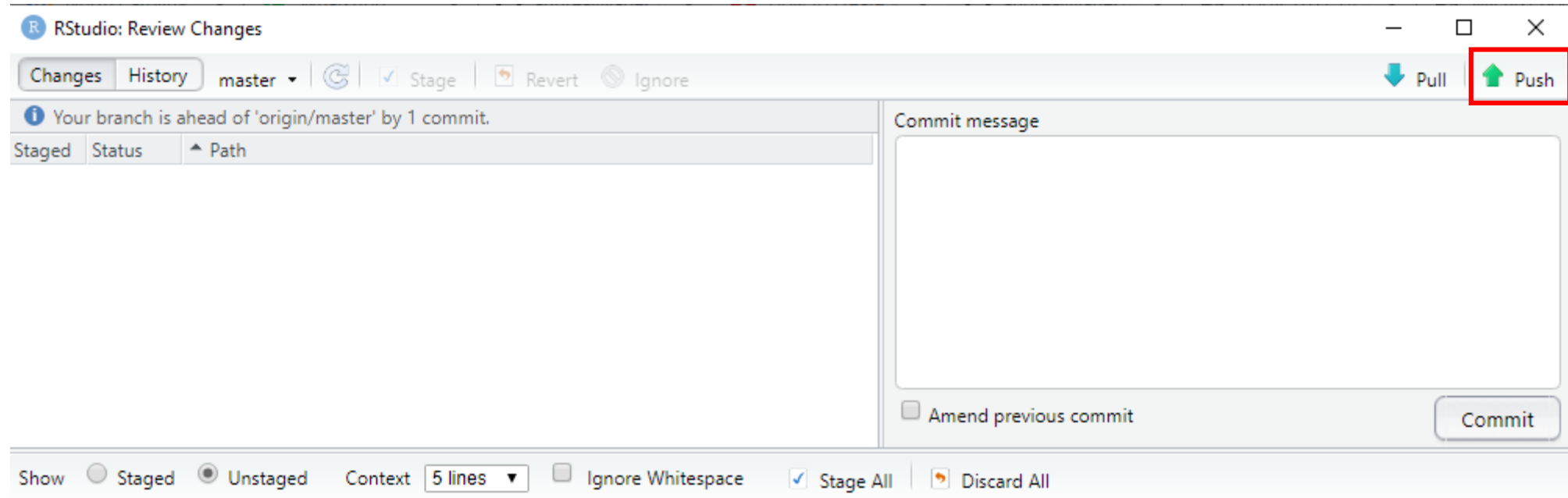
Excellent resource on the steps we followed on Github: <https://nceas.github.io/oss-lessons/version-control/4-getting-started-with-git-in-RStudio.html>

# Once you clicked on Commit...

- Write a commit message.
- Click on Commit.



# And then push the changes





# Go back to your repo

- Write `usethis::browse_github()` on the console to go back to your repo
- Click on the URL. Notice that it will take some minutes to be updated.
- In the meantime, you can edit your README file.

Lastly, you can modify your .Rmd files, and include any type of analysis/code/images you want.

Tip: remember to render the book locally before committing/pushing to Github.

# My first bookdown

Andrea Villanes

2023-11-17

## Section 1 Executive Summary

