

# How to write an R package and publish it on GitHub

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# What is R package?

- Collection of code, data, documentation developed by R community
- Addresses particular problem with specialized statistical technique, graphical device, etc.
- Core set of packages come with base R
- > 15,000 Additional packages available from CRAN, Bioconductor, Omegahat, GitHub, etc.
- Popular R packages
  - `dplyr`
  - `ggplot2`



# What is GitHub?

- Website that hosts software development and version control using Git
- Free basic services



# Why write R package?

- For yourself
- For others
  - Increasingly, (bio)statistical journals ask for R package development of novel method

# Why publish package on GitHub?

- Reproducibility
- Accessibility
- Collaboration
- Back-up method

# What do you need to write R package?

- R Studio (<https://rstudio.com/>)
- devtools package
- Git (<https://git-scm.com/>)
- GitHub account (<https://github.com/>)

## Some other useful packages

- here
- available



# Let's begin!

## Major steps

1. Create new repo in GitHub
  - i) Copy URL
2. Open R Studio
  - i) New Project → Version Control → Git → Enter info → Create Project
  - ii) Install devtools
  - iii) Build package
3. Pull + Commit + Push
4. Use/share package with `install_github()`!

## First, log in and go to Repositories

The screenshot shows the GitHub profile page for Aya Mitani. The 'Repositories' tab is highlighted with a red circle. The page displays a profile picture of a lily of the valley flower, the name 'Aya Mitani', and the title 'Assistant Professor'. Below this, there is a link to 'Edit profile' and statistics showing '1 follower' and '1 following'. The user's affiliation is listed as 'Division of Biostatistics, University of Toronto, ON' with the email 'ayamitani@gmail.com'. The 'Pinned' section shows three repositories: 'CWGEE', 'ipccwGEE', and 'modelkappa'. The '42 contributions in the last year' section features a calendar grid showing contribution activity from October to October. The bottom of the page shows the Windows taskbar with various application icons and the system clock indicating 2:37 PM on 2020-10-22.

Overview **Repositories 12** Projects Packages

**Pinned**

- CWGEE**  
Cluster weighted generalized estimating equations for clustered longitudinal data with informative cluster size
- ipccwGEE**  
Inverse probability censoring cluster weighted generalized estimating equations for clustered longitudinal data with informative cluster size and informative drop-out
- modelkappa**  
Calculate model-based kappa of agreement and association and their standard errors

**42 contributions in the last year**

Contribution settings



Then, create new repository

The screenshot shows the GitHub user profile page for Aya Mitani. The page layout includes a header with navigation links (Pull requests, Issues, Marketplace, Explore) and a search bar. The main content area is divided into two columns. The left column features the user's profile picture (a green plant), name (Aya Mitani), title (Assistant Professor), and a list of repositories. The right column displays a list of repositories with details such as name, description, language, and update time. The 'New' button, located in the top right corner of the repository list, is circled in red. The bottom of the page shows a Windows taskbar with various application icons and system status indicators.

Search or jump to...

Overview Repositories 12 Projects Packages

Find a repository... Type: All Language: All **New**

**testpackage**  
This is a test package  
R Updated 22 hours ago

**R-package-tutorial**  
How to write an R package and connect it to GitHub  
TeX Updated 23 hours ago

**multoutcomeICS**  
Code for simulation study in "Marginal analysis of multiple outcomes with informative cluster size"  
R Updated 7 days ago

**CHL5222H\_Winter2021**  
Files for Analysis of Correlated Data

**Aya Mitani**  
AyaMitani  
Assistant Professor  
Edit profile  
Rx 1 follower · 1 following · ☆ 0  
Division of Biostatistics, University of To...  
Toronto, ON  
ayamitani@gmail.com

Highlights

Type here to search

100% 2:39 PM 2020-10-22

## Repo name should be same as package name

Create a New Repository

github.com/new

Apps UoIf Library Grant BU R

Search or jump to... Pull requests Issues Marketplace Explore

### Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Owner \* AyaMitani / Repository name \*

Great repository names are short and memorable. Need inspiration? How about shiny-tribble?

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.

Initialize this repository with:

Skip this step if you're importing an existing repository.

☐ Add a README file  
This is where you can write a long description for your project. [Learn more.](#)

☐ Add .gitignore  
Choose which files not to track from a list of templates. [Learn more.](#)

Type here to search

100% 2:40 PM 2020-10-22

Some tips:

- Make it short
- If one word, use all lowercase
- If multiple words, mix lowercase and uppercase
- Avoid using characters (., \_) between words

## Aside: Naming R package

Check to see if name is unique, especially if you plan to submit to CRAN

```
install.packages("available")  
library(available)
```

```
available("ayapack", browse = FALSE)
```

```
## -- ayapack -----  
## Name valid: <U+2714>  
## Available on CRAN: <U+2714>  
## Available on Bioconductor: <U+2714>  
## Available on GitHub: <U+2714>  
## Abbreviations: http://www.abbreviations.com/ayapack  
## Wikipedia: https://en.wikipedia.org/wiki/ayapack  
## Wiktionary: https://en.wiktionary.org/wiki/ayapack  
## Urban Dictionary:  
##   Not found.  
## Sentiment:???
```

# Back to GitHub

## Finish creating new repo

Create a New Repository

github.com/new

Apps UoIf Library Grant BU R

Other bookmarks

A repository contains all project files, including the revision history. Already have a project repository elsewhere?  
[Import a repository.](#)

Owner \* Repository name \*

AyaMitani / mypackage ✓

Great repository names are short and memorable. Need inspiration? How about shiny-tribble?

Description (optional)

this is my package

☒ 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.

Initialize this repository with:

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☒ Add a README file  
This is where you can write a long description for your project. [Learn more.](#)

☐ Add .gitignore  
Choose which files not to track from a list of templates. [Learn more.](#)

☐ Choose a license  
A license tells others what they can and can't do with your code. [Learn more.](#)

This will set `main` as the default branch. Change the default name in your [settings](#).

Create repository

## Finally, copy URL

The screenshot shows a web browser displaying the GitHub repository page for 'AyaMitani/mypackage'. The repository is in the 'main' branch and has an 'Initial commit'. The 'README.md' file is visible, containing the text 'mypackage' and 'this is my package'. The 'Code' button is highlighted with a red circle, and the 'Clone' dropdown menu is open, showing the 'HTTPS' URL 'https://github.com/AyaMitani/mypackage' which is also circled in red. The 'About' section on the right indicates 'this is my package' and 'No releases published'. The footer of the page shows the GitHub logo, copyright information, and various links like Terms, Privacy, Security, Status, Help, Contact GitHub, Pricing, API, Training, Blog, and About.

Load libraries

```
library(devtools)
```

```
library(here)
```

## Turn this project into a package

```
devtools::create(here::here())
```

This will create 3 additional files

- DESCRIPTION: This is where all the meta-data about your package goes. You can edit this file manually.
- NAMESPACE: This file indicates what needs to be exposed to users for your R package. Do not edit this file.
- R: This is where all your R code goes for your package.



## Add your function

Open new R script and write your function

```
myfunc <- function(x){  
  y <- x + x  
  return(y)  
}
```

## Add your function

Include `@export` tag above your function to indicate this function to be “exposed” to users.

```
#' @export  
myfunc <- function(x){  
  y <- x + x  
  return(y)  
}
```

## Add your function

Also, include documentation for your function when you go  
?myfunc.

```
#' This is my function.  
#'  
#' This function returns a value from adding the parameters.  
#' @param x  
#' @return y  
#' @export  
myfunc <- function(x){  
  y <- x + x  
  return(y)  
}
```

## Add your function

Now run

```
devtools::document()
```

- This will create `man` directory that includes read-only file `myfunc.Rd`
- Note that `NAMESPACE` file has been updated

