



# Using Git for Version Control and Collaboration

July 9, 2025



# "FINAL".doc



FINAL.doc!



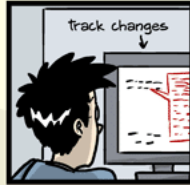
FINAL\_rev.2.doc



FINAL\_rev.6.COMMENTS.doc



FINAL\_rev.8.comments5.  
CORRECTIONS.doc



FINAL\_rev.18.comments7.  
corrections9.MORE.30.doc



FINAL\_rev.22.comments49.  
corrections.10.#@\$%WHYDID  
ICOMETOGRADSCHOOL?????.doc

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# What will you walk away with?



- Confidence in your code
- A better understanding of existing tools
- Improve your skills

# Important notes for this talk



- This is **not** an in-depth tutorial
- Will be focused on examples using R
- Uses content from:

<https://git-is-my-lab-book.net>

<https://swcarpentry.github.io/git-novice/>

# What is version control?



- A systematic way to record changes to a file
- Think of it as a way to record your progress!
- Allows you to restore a file to a previous version

# How do I maintain version control?



Accelerating towards P. vivax elimination with a novel serological test-and-treat strategy: A modelling case study in Brazil. *The Lancet Regional Health – Americas*, 22.

<https://doi.org/10.1016/j.lana.2023.100511>

Obadia, T., Nekkab, N., Robinson, L. J., Drakeley, C., Mueller, I., & White, M. T. (2022).

Developing sero-diagnostic tests to facilitate Plasmodium vivax Serological Test-and-Treat approaches: Modeling the balance between public health impact and overtreatment. *BMC Medicine*, 20(1), 98. <https://doi.org/10.1186/s12916-022-02285-5>

Robinson, L. J., Wampfler, R., Betuela, I., Karl, S., White, M. T., Li Wai Suen, C. S. N., Hofmann, N. E., Kinboro, B., Waltmann, A., Brewster, J., Lorry, L., Tarongka, N., Samol, L., Silkey, M., Bassat, Q., Siba, P. M., Schofield, L., Felger, I., & Mueller, I. (2015). Strategies for understanding and reducing the Plasmodium vivax and Plasmodium ovale hypnozoite reservoir in Papua New Guinean children: A randomised placebo-controlled trial and mathematical model. *PLoS Medicine*, 12(10), e1001891.

<https://doi.org/10.1371/journal.pmed.1001891>

Sandfort, M., Vantaux, A., Kim, S., Obadia, T., Pepey, A., Gardais, S., Khim, N., Lek, D., White, M., Robinson, L. J., Witkowski, B., & Mueller, I. (2020). Forest malaria in Cambodia: The occupational and spatial clustering of Plasmodium vivax and Plasmodium falciparum infection risk in a cross-sectional survey in Mondulkiri province, Cambodia. *Malaria Journal*, 19(1), 413. <https://doi.org/10.1186/s12936-020-03482-4>

Stan Development Team (2023). RStan: the R interface to Stan. R package version

2.26.23, <https://mc-stan.org/>.

## Version History

### Current version

Modified by: Felicia Bongiovanni 11:55 AM

### May 06, 2024

Modified by: Felicia Bongiovanni 10:47 AM  
[Open Version](#)

### September 19, 2023

Modified by: Felicia Bongiovanni 1:25 PM  
[Open Version](#)

Modified by: Felicia Bongiovanni 1:21 PM  
[Open Version](#)

# How do I maintain version control?



Viewing 23rd May - 3:58 pm

1 change in main.tex [Restore this version](#) [All history](#) [Labels](#)

```
104 \author[1,*]{Fifth Author}
105 \affil[1]{\small Department, Organization, Street, City, 100190, State, Country}
106 \affil[2]{Department, Organization, Street, City, 10587, State, Country}
107 \affil[3]{Department, Organization, Street, City, 610101, State, Country}
108 \affil[*]{Corresponding author: \texttt{user\_id@university.edu}}
109
110 \date{} % Remove date
111
112 \begin{document}
113 \maketitle
114
115 \begin{abstract}
116
117 \end{abstract}
118
119 \textbf{Keywords}:
120
121 %-----
122 % Paper Body
123 %-----
124 %-- Section --%
125 \input{sections/introduction}
126 \input{sections/methods}
127 \input{sections/results}
128 \input{sections/discussion}
129
130
131
132
133
134 %-----
135 % References
136 %-----
137
138 % Print bibliography
139 \printbibliography
140
141
142
143
144 %-----
145 % Appendix
146 %-----
147
148
149 \end{document}
```

Mon, 27th May 24

sections/methods.tex

You

Fri, 24th May 24

24th May, 10:55 am

Edited sections/methods.tex

You

Thu, 23rd May 24

23rd May, 3:58 pm

Edited main.tex

Edited sections/discussion.tex

Edited sections/results.tex

You

23rd May, 3:58 pm

Created sections/discussion.tex

Created sections/results.tex

You

23rd May, 3:57 pm

Edited main.tex

Edited sections/introduction.tex

Edited sections/methods.tex

You

23rd May, 3:56 pm

# How do I maintain version control?



# Git



# What is git?



- **A version control system**
- Often preinstalled on macOS and native on Linux  
(needs installation on Windows)

# What is Github?



- An online server to store your files based on **git**
- Others exist: GitLab, Gitea



**How do these come together...?**



# Let's play the Git Game!

# 1: Start game

The image shows the RStudio interface. The console on the left displays the R startup message for version 4.4.0 (2024-04-24), including copyright information and instructions on how to use R. The documentation pane on the right shows the 'Fit a model with Stan' page, which includes a description of the function and its usage. The usage section contains a code block with the function signature and various arguments.

R version 4.4.0 (2024-04-24) -- "Puppy Cup"  
Copyright (C) 2024 The R Foundation for Statistical Computing  
Platform: aarch64-apple-darwin20

R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.

[Workspace loaded from ~/.RData]

> |

Environment History Connections Tutorial  
R + Global Environment -

Environment is empty

Files Plots Packages Help Viewer Presentation  
R: Fit a model with Stan - Find in Topic

stan (rstan) R Documentation

### Fit a model with Stan

**Description**

Fit a model defined in the Stan modeling language and return the fitted result as an instance of `stanfit`.

**Usage**

```
stan(file, model_name = "anon_model", model_code = "", fit = NA,  
data = list(), pars = NA,  
chains = 4, iter = 2000, warmup = floor(iter/4), thin = 1,  
init = "random", seed = sample.int(.Machine$integer.max, 1),  
algorithm = c("NUTS", "HMC", "Fixed_param"),  
control = NULL, sample_file = NULL, diagnostic_file = NULL,  
save_dso = TRUE, verbose = FALSE, include = TRUE,  
cores = getOption("mc.cores", 1L),  
open_progress = interactive() && !isatty(stdout()) &&  
  identical(Sys.getenv("RSTUDIO"), "1"),  
....  
boost_lib = NULL, eigen_lib = NULL  
)
```

**Arguments**

# 1: Start game



The screenshot shows the RStudio interface with a new R Markdown document open. The editor displays the following code:

```
1 ---
2 title: "example"
3 author: "Felicia Bangiovanni"
4 date: "2025-07-04"
5 output: html_document
6 ---
7
8 {r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10
11
12 ## R Markdown
13
14 This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details
15 on using R Markdown see <http://rmarkdown.rstudio.com>.
16
17 When you click the "Knit" button a document will be generated that includes both content as well as the output of any embedded R code
18 chunks within the document. You can embed an R code chunk like this:
19
20 {r cars}
21 summary(cars)
22
23
24 ## Including Plots
25
26 You can also embed plots, for example:
27
28 {r pressure, echo=FALSE}
29 plot(pressure)
```

The console shows the R version and copyright information:

```
R version 4.4.0 (2024-04-24) -- "Puppy Cup"
Copyright (C) 2024 The R Foundation for Statistical Computing
Platform: aarch64-apple-darwin20

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'licence()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

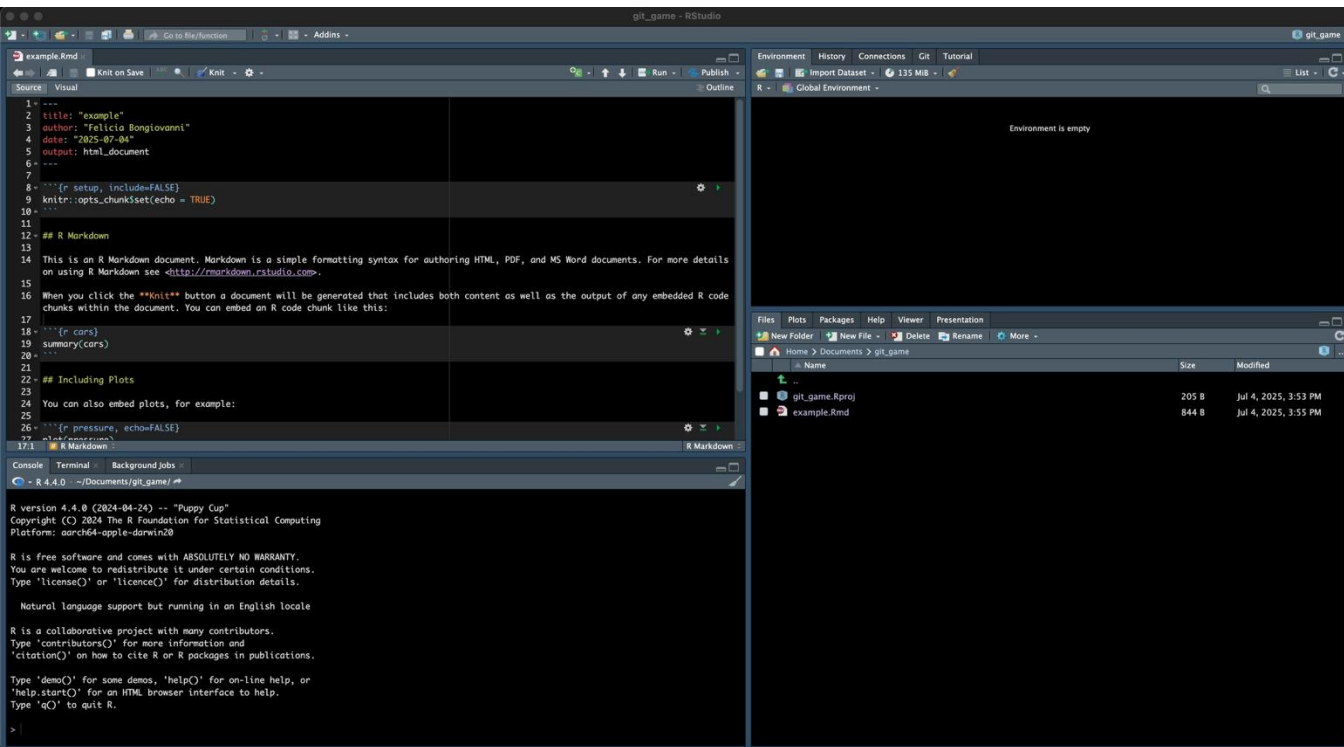
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

>
```

The file explorer on the right shows the project structure:

File	Size	Modified
git_game.Rproj	205 B	Jul 4, 2025, 3:53 PM
example.Rmd	844 B	Jul 4, 2025, 3:55 PM

# 1: Start game



# 2: Initialising game

The image shows the RStudio interface with the following components:

- Source Editor:** Contains R code for a data frame and a plot. The code is as follows:

```
29 Note that the 'echo = FALSE' parameter was added to the code chunk to prevent printing of the R code that generated the plot.  
30  
31  
32  
33  
34 head(cars)  
35  
36  
37  
38  
39  
40  
41
```

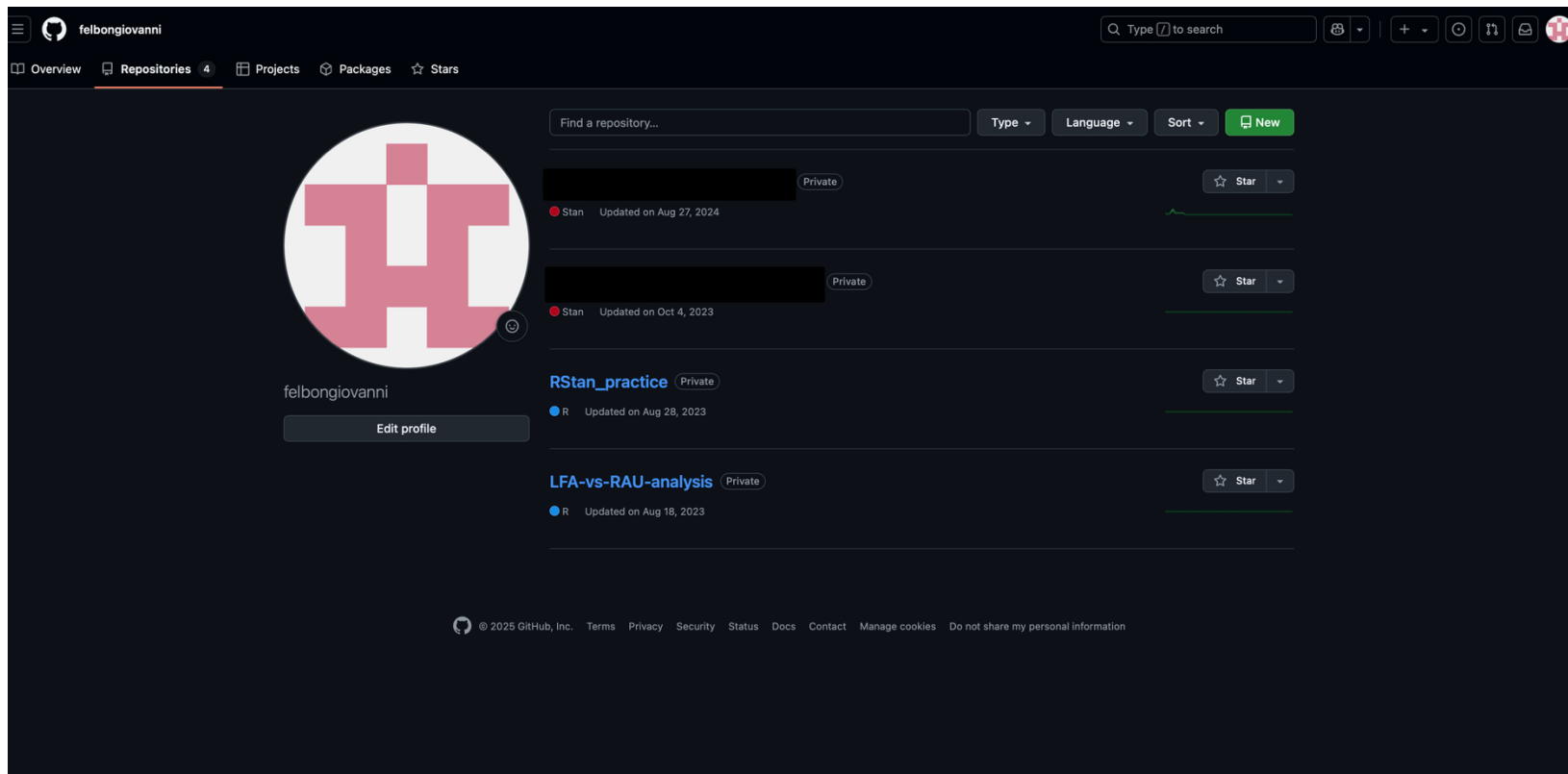
	speed <dbl>	dist <dbl>
1	4	2
2	4	10
3	7	4
4	7	22
5	8	16
6	9	10
- Environment:** Shows "Environment is empty".
- Files:** Shows the file explorer with the following files:

Name	Size	Modified
git_game.Rproj	205 B	Jul 4, 2025, 3:53 PM
example.Rmd	874 B	Jul 4, 2025, 4:24 PM
- Terminal:** Shows the command prompt: `mac4009:git_game bongiovanri.fs`





# 3: Store game in multiple places



The screenshot shows the GitHub profile page for user 'felbongiovanni'. The profile includes a circular avatar with a pink and white pixelated 'H' design, the username 'felbongiovanni', and an 'Edit profile' button. The 'Repositories' tab is active, showing a list of repositories. The first two are private and redacted with black boxes. The third is 'RStan\_practice' (Private, R, updated Aug 28, 2023). The fourth is 'LFA-vs-RAU-analysis' (Private, R, updated Aug 18, 2023). The footer contains copyright information for GitHub, Inc. and links to Terms, Privacy, Security, Status, Docs, Contact, Manage cookies, and Do not share my personal information.

felbongiovanni

Overview Repositories 4 Projects Packages Stars

Find a repository... Type Language Sort New

Private Star

Stan Updated on Aug 27, 2024

Private Star

Stan Updated on Oct 4, 2023

RStan\_practice Private Star

R Updated on Aug 28, 2023



LFA-vs-RAU-analysis Private Star

R Updated on Aug 18, 2023







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# 3: Store game in multiple places



 New repository

Q Type [f](#) to search


## 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 (\*).

Owner \*


Repository name \*

 felbongiovanni


/

Great repository names are short and memorable. Need inspiration? How about [silver-fishstick](#) ?

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:

☐ Add a README file

This is where you can write a long description for your project. [Learn more about READMEs](#).

Add .gitignore


.gitignore template: None

Choose which files not to track from a list of templates. [Learn more about ignoring files](#).

Choose a license

License: None

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

 You are creating a public repository in your personal account.

Create repository

# 3: Store game in multiple places

The image shows the RStudio interface. The main editor window displays an R script with a comment and a data frame. The environment window shows an empty environment. The file explorer window shows the project files.

example.Rmd

29 Note that the 'echo = FALSE' parameter was added to the code chunk to prevent printing of the R code that generated the plot.

31

32

33 `##> r`

34 `head(cars)`

35

	speed	dist
	<dbl>	<dbl>
1	4	2
2	4	10
3	7	4
4	7	22
5	8	16
6	9	10

6 rows

36

37

38

39

40

41

354 Including Plots

Console Terminal Background Jobs

Terminal 4 ~ /Documents/git\_game

mac6009:git\_game bonglovanni.f3

Environment History Connections Git Tutorial

R - Global Environment

Environment is empty

Files Plots Packages Help Viewer Presentation

New Folder New File Delete Rename More

Home > Documents > git\_game

Name	Size	Modified
..		
git_game.Rproj	205 B	Jul 4, 2025, 3:53 PM
example.Rmd	874 B	Jul 4, 2025, 4:24 PM

Save Game?

Save in Slot 1

Save in Slot 2

Save in Slot 3

No

Accept

# 3: Store game in multiple places



The screenshot shows a GitHub repository interface for 'git\_game\_repo' by user 'felbongiovanni'. The repository is private and has 0 watches, 0 forks, and 0 stars. The main branch is 'main' with 1 branch and 0 tags. The commit history shows 2 commits. The file list includes '.Rproj.user', 'example.Rmd', and 'git\_game.Rproj'. The README section is empty with a prompt to 'Add a README'. The right sidebar shows the repository description, activity, and sections for releases and packages.

felbongiovanni / git\_game\_repo

Code Issues Pull requests Actions Projects Security Insights Settings

git\_game\_repo Private Watch 0 Fork 0 Star 0

main 1 Branch 0 Tags

Go to file Add file Code

felbongiovanni Added code to see the "cars" R data. 0c2bb67 · 18 minutes ago 2 Commits

.Rproj.user	Added code to see the "cars" R data.	18 minutes ago
example.Rmd	Added code to see the first rows of the "cars" R data.	23 minutes ago
git_game.Rproj	Added code to see the first rows of the "cars" R data.	23 minutes ago

README

Add a README

Add a README with an overview of your project.

Add a README

About

This is the GitHub repo for the git\_game

Activity

0 stars

0 watching

0 forks

Releases

No releases published

Create a new release

Packages

No packages published

Publish your first package

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# 4: Save your checkpoints!

The image shows the RStudio interface with the 'git\_game' project open. The script editor on the left contains R code for loading and summarizing the 'iris' dataset. The environment pane on the right shows the 'iris' dataset with 150 observations. The console at the bottom shows the output of the code and the results of a git command to push the code to a remote repository.

```
36  
37 ~~~~{r}  
38 data("iris")  
39 summary(iris)  
40  
41  
42 ~~~~
```

Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
Min. :4.300	Min. :2.000	Min. :1.000	Min. :0.100	setosa :50
1st Qu.:5.100	1st Qu.:2.800	1st Qu.:1.600	1st Qu.:0.300	versicol.:50
Median :5.800	Median :3.000	Median :4.350	Median :1.300	virginica :50
Mean :5.843	Mean :3.057	Mean :5.758	Mean :1.199	
3rd Qu.:6.400	3rd Qu.:3.300	3rd Qu.:5.100	3rd Qu.:1.800	
Max. :7.900	Max. :4.400	Max. :6.900	Max. :2.500	

```
mac4009:git_game bongiovanni.f$ git remote add origin git@github.com:felbongiovanni/git_game_repo.git  
error: remote origin already exists.  
mac4009:git_game bongiovanni.f$ git branch -M main  
mac4009:git_game bongiovanni.f$ git push -u origin main  
Enumerating objects: 58, done.  
Counting objects: 100% (58/58), done.  
Delta compression using up to 10 threads.  
Compressing objects: 100% (45/45), done.  
Writing objects: 100% (58/58), 47.74 KiB | 801.00 KiB/s, done.  
Total 58 (delta 6), reused 0 (delta 0), pack-reused 0  
remote: Resolving deltas: 100% (6/6), done.  
To github.com:felbongiovanni/git_game_repo.git  
+ [new branch] main -> main  
branch 'main' set up to track 'origin/main'.  
mac4009:git_game bongiovanni.f$
```



# 4: Save your checkpoints!



The screenshot shows a GitHub repository page for 'git\_game\_repo' by user 'felbongiovanni'. The repository is private and has 0 stars and 0 forks. The main branch is 'main'. The commit history shows three commits: '.Rproj.user' (2 minutes ago), 'example.Rmd' (2 minutes ago), and 'git\_game.Rproj' (27 minutes ago). The README section is empty, with a button to 'Add a README'. The right sidebar shows the 'About' section, which states 'This is the GitHub repo for the git\_game', and the 'Releases' and 'Packages' sections, both of which are empty.



<https://au.pinterest.com/pin/302374562460261348/>

# 5: Multiplayer mode

The image shows the R Studio interface. The top-left pane displays R code: 

```
36 ...{r}  
38 data("iris")  
39 summary(iris)  
40  
41 ...  
42 ...
```

 The top-right pane shows the 'Global Environment' with a data object 'iris' containing 150 observations of 5 variables. The bottom-left pane shows the 'Console' with the output of the summary function: 

```
Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
Min. :4.300 Min. :2.000 Min. :1.000 Min. :0.100 setosa :50  
1st Qu.:5.100 1st Qu.:2.800 1st Qu.:1.600 1st Qu.:0.300 versicolor:50  
Median :5.800 Median :3.000 Median :4.350 Median :1.300 virginica :50  
Mean :5.843 Mean :3.057 Mean :3.758 Mean :1.199  
3rd Qu.:6.400 3rd Qu.:3.300 3rd Qu.:5.100 3rd Qu.:1.800  
Max. :7.900 Max. :4.400 Max. :6.900 Max. :2.500
```

 The bottom-right pane shows the 'Files' pane with a directory listing: 

Name	Size	Modified
git_game.Rproj	205 B	Jul 4, 2025, 3:53 PM
example.Rmd	913 B	Jul 4, 2025, 4:39 PM



# 5: Multiplayer mode



Main

Felicia's branch

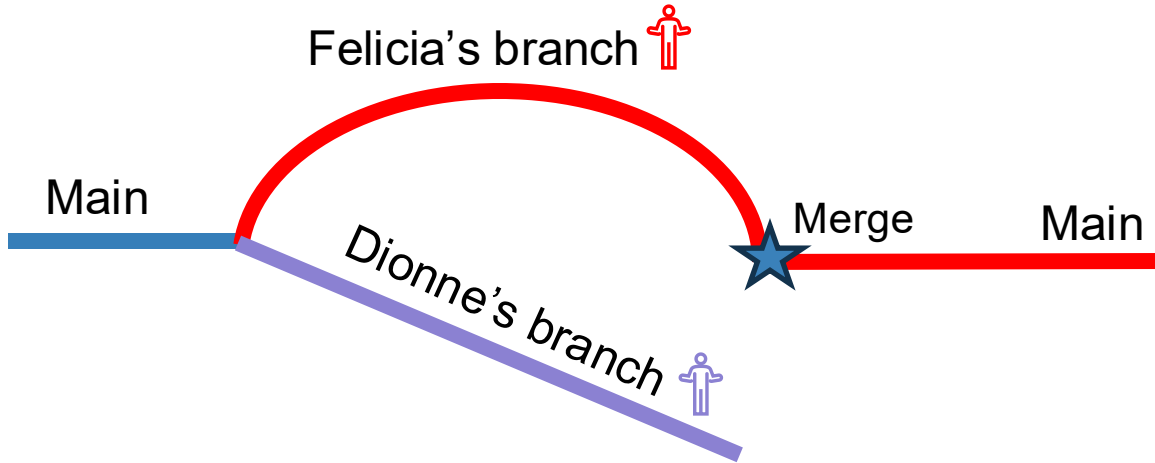


Dionne's branch

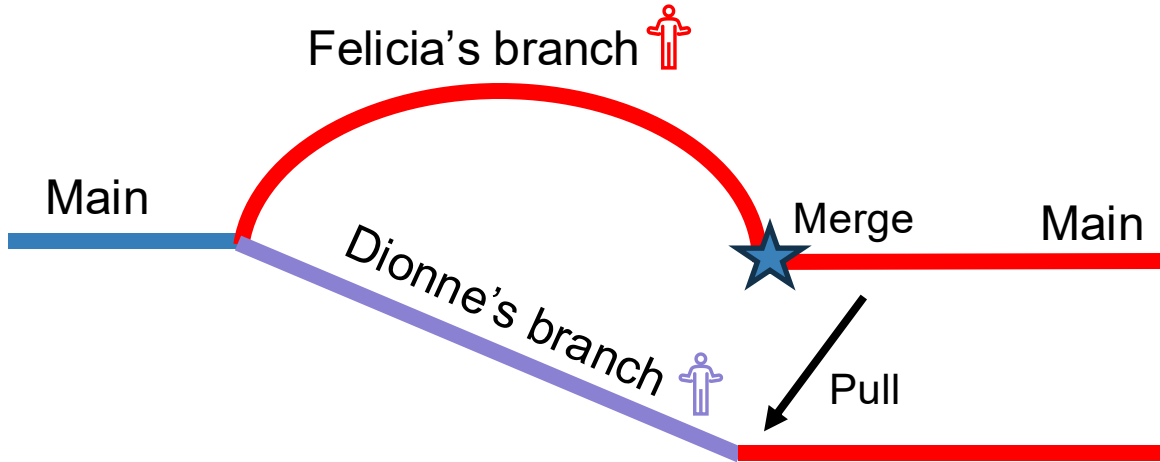




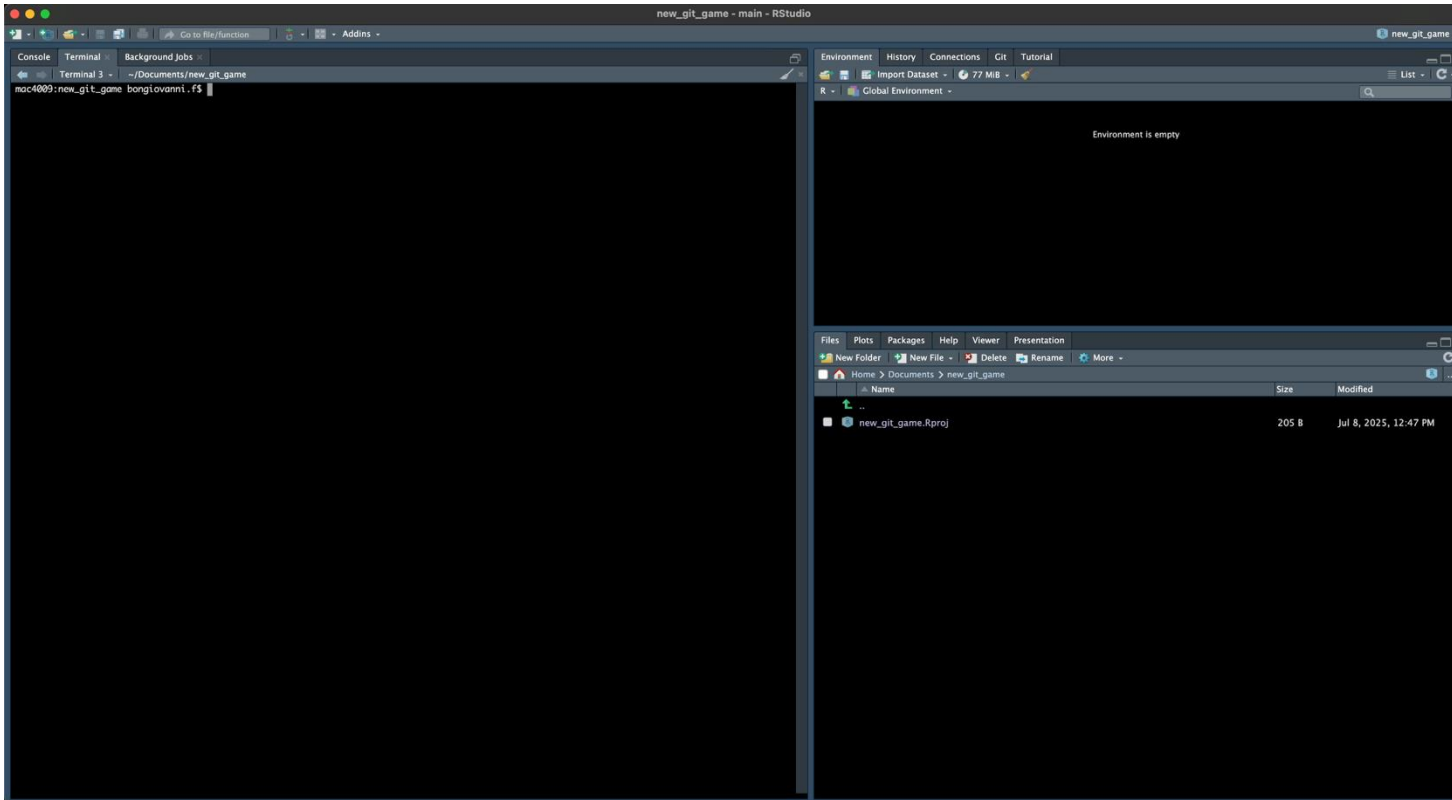
# 5: Multiplayer mode



# 5: Multiplayer mode



# 6: Loading a game



LOADING...

VectorStock

VectorStock.com/49392656

# Benefits to using git for collaboration



- See what changes other people have made and learn from them
- Ease of sharing
- Code reproducibility

# Key takeaways



- **Git** is a version control system
- **Github** is where you can store your git repositories
- Starting is the hardest part
- Loads of tutorials and help online!



Would you like to  
give a **seminar,**  
**workshop, short talk**  
at the R-Ladies  
Melbourne meetups?

# You can find us...

