

# rbtl - Research Beyond the Lab

Version control and more tools

Lars Schöbitz

2022-03-09

# Today

1. Assignment grading and conversion
2. What is Version Control?
3. RStudio Cloud & RStudio IDE

# Assignments & Grades

## Due dates: Assignments 1, 2, and 3

Full points for assignment 1, 2, and 3 if submitted by:

**15th March**

# Submission complete? Full points?

- If you haven't heard from me by Wednesday, then you have successfully submitted your assignment.

# Grade conversion

grade	points
6.00	100
5.75	95
5.50	90
5.25	85
5.00	80
4.75	75
4.50	70
4.25	60
4.00	50
3.50	40
3.00	30
2.50	20
2.00	10
1.00	0

Grading scheme and conversion details in syllabus on course website

# What is Version Control?

# Version Control

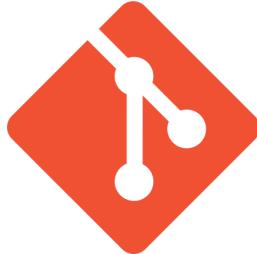
A way to share files with others, so they can:

- download
- re-use
- contribute

You can view the history of files, and jump back in time to any point.

# Why is it useful?

# Git and GitHub



- Git is a software for version control
- Released in 2005
- Popular among programmers collaboratively developing code
- Tracks changes in a set of files (directory/folder/repository)

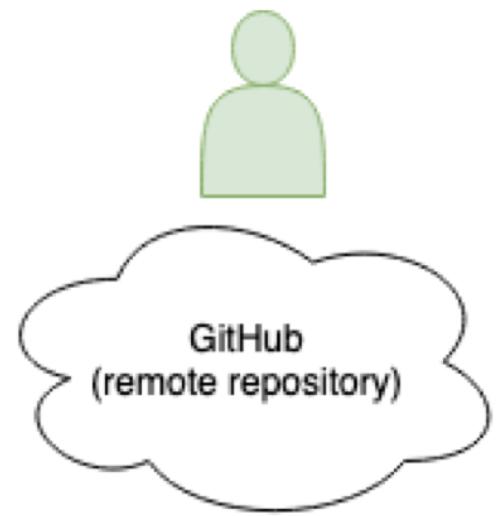


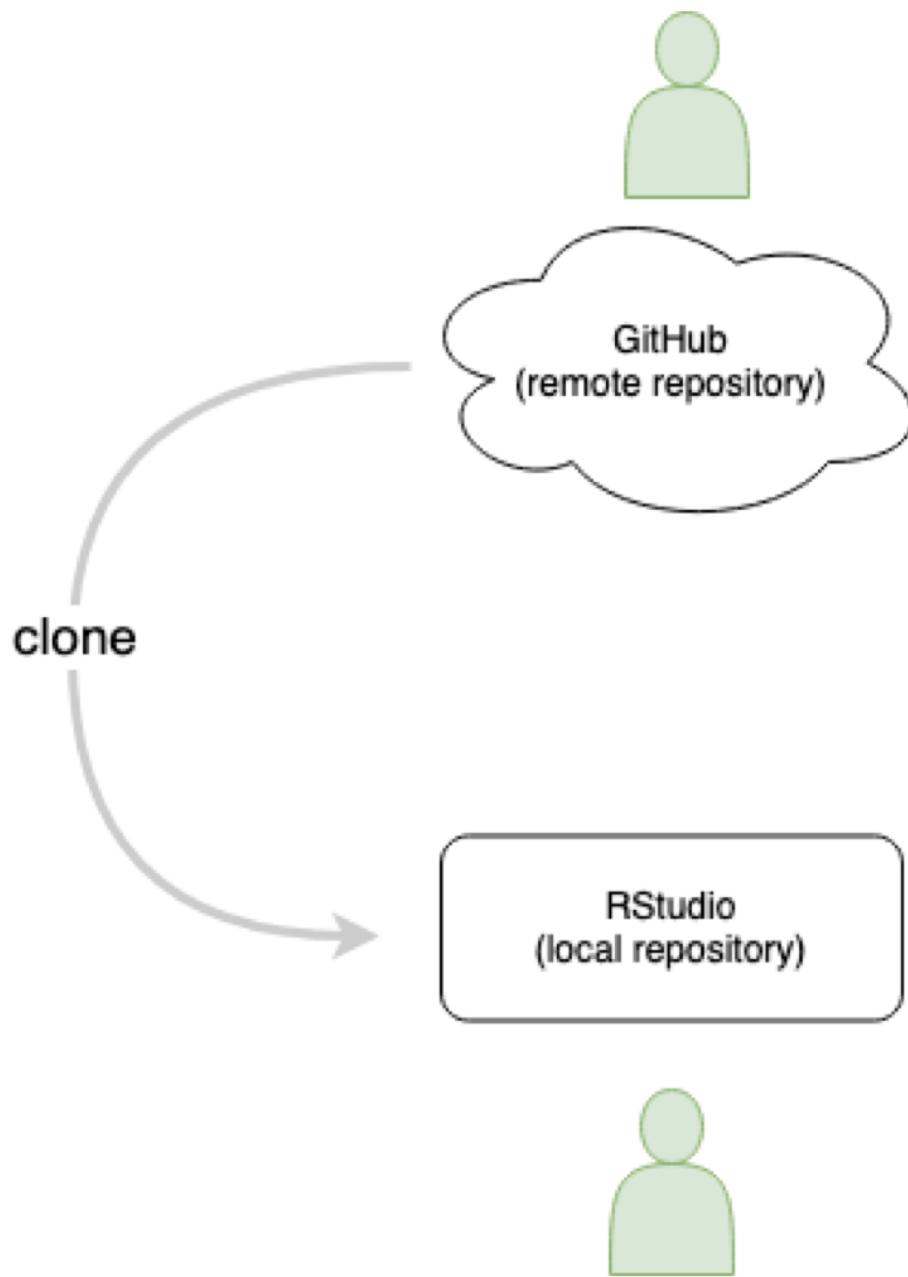
- GitHub is a hosting platform for version control using Git
- Launched in 2008, acquired by Microsoft in 2018, Microsoft for US\$ 7.5 billion
- 73 million Users ([February, 2022](#))
- Facebook for Software Developers

# Homework Assignment 2

---

Version Control - Terminology

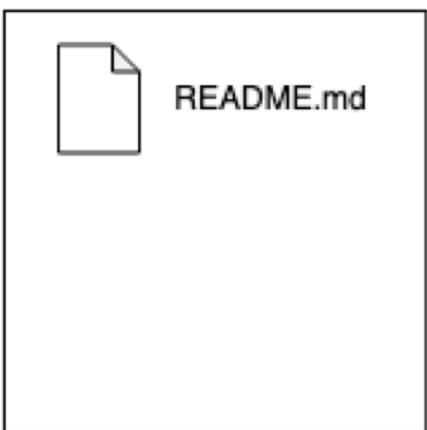


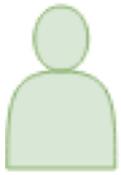




Create README.md

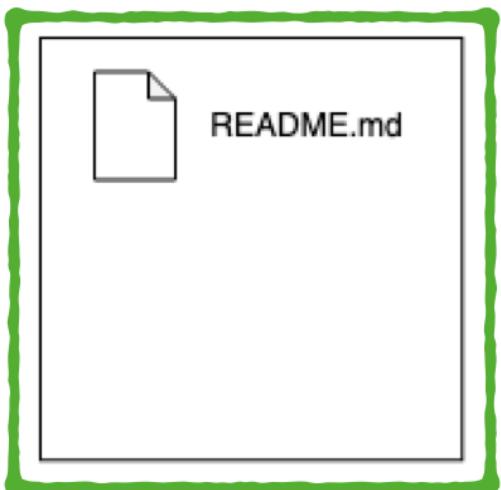
75aa637





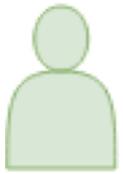
Create README.md

75aa637



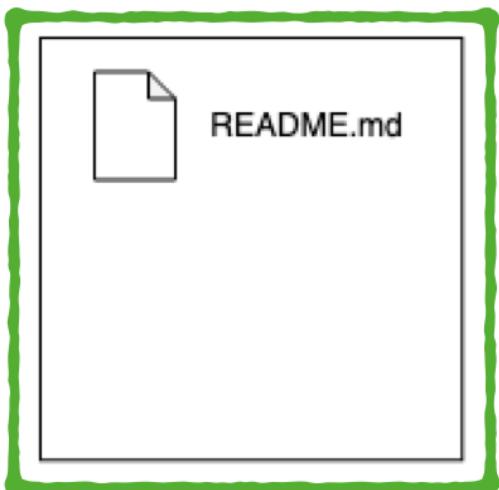
Repo(sitory)

Commit  
message



Create README.md

75aa637



Repo(sitory)

Commit  
message



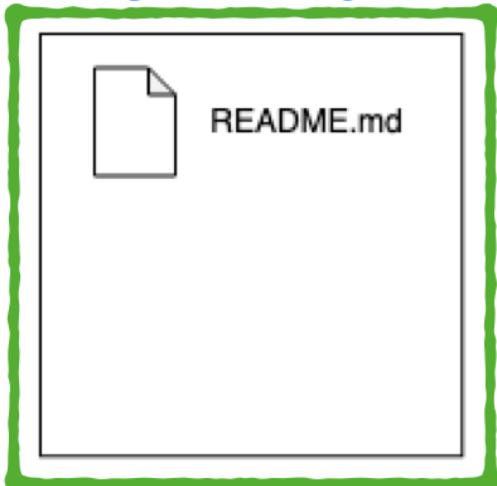
Create README.md

75aa637

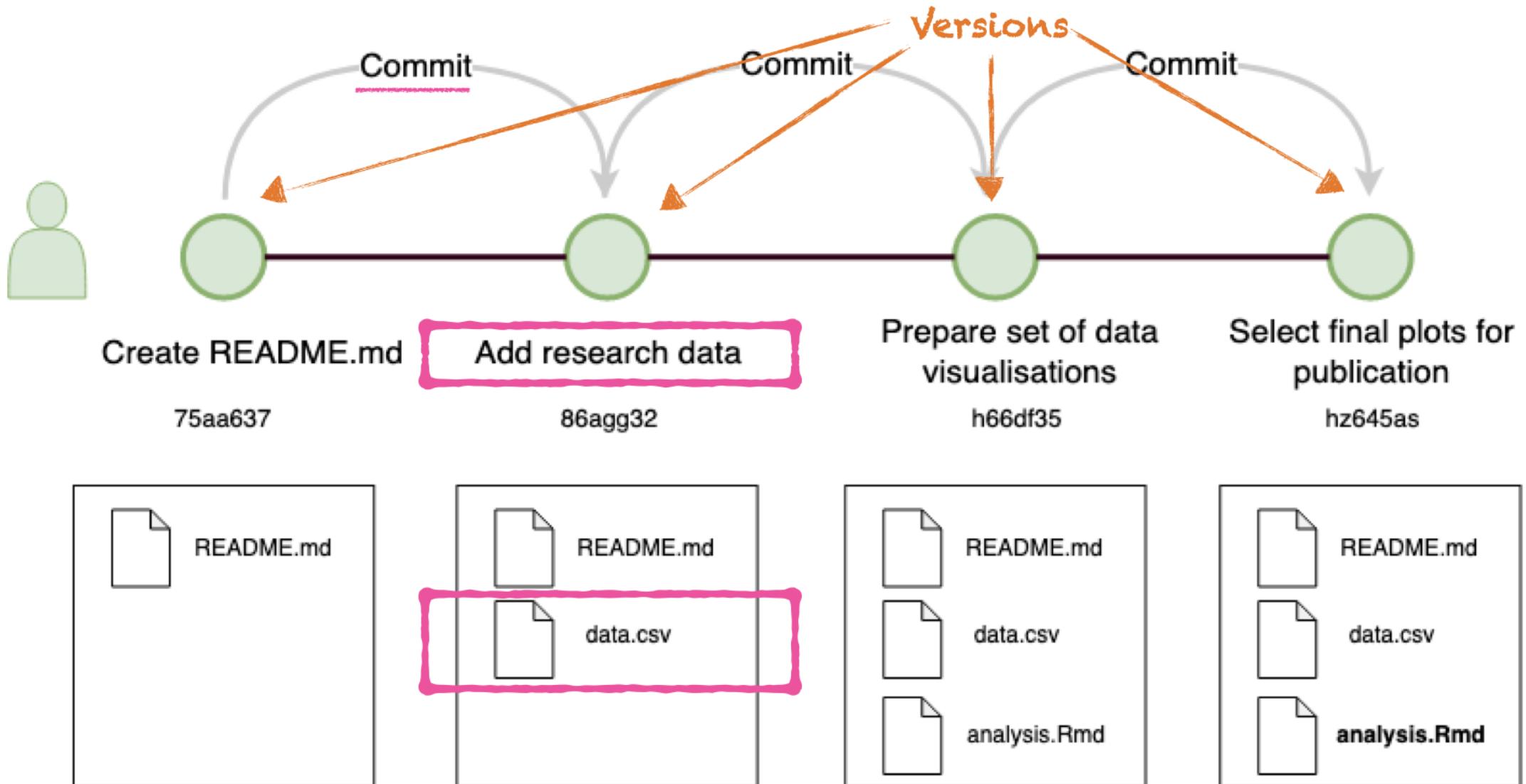
SHA-1 hash

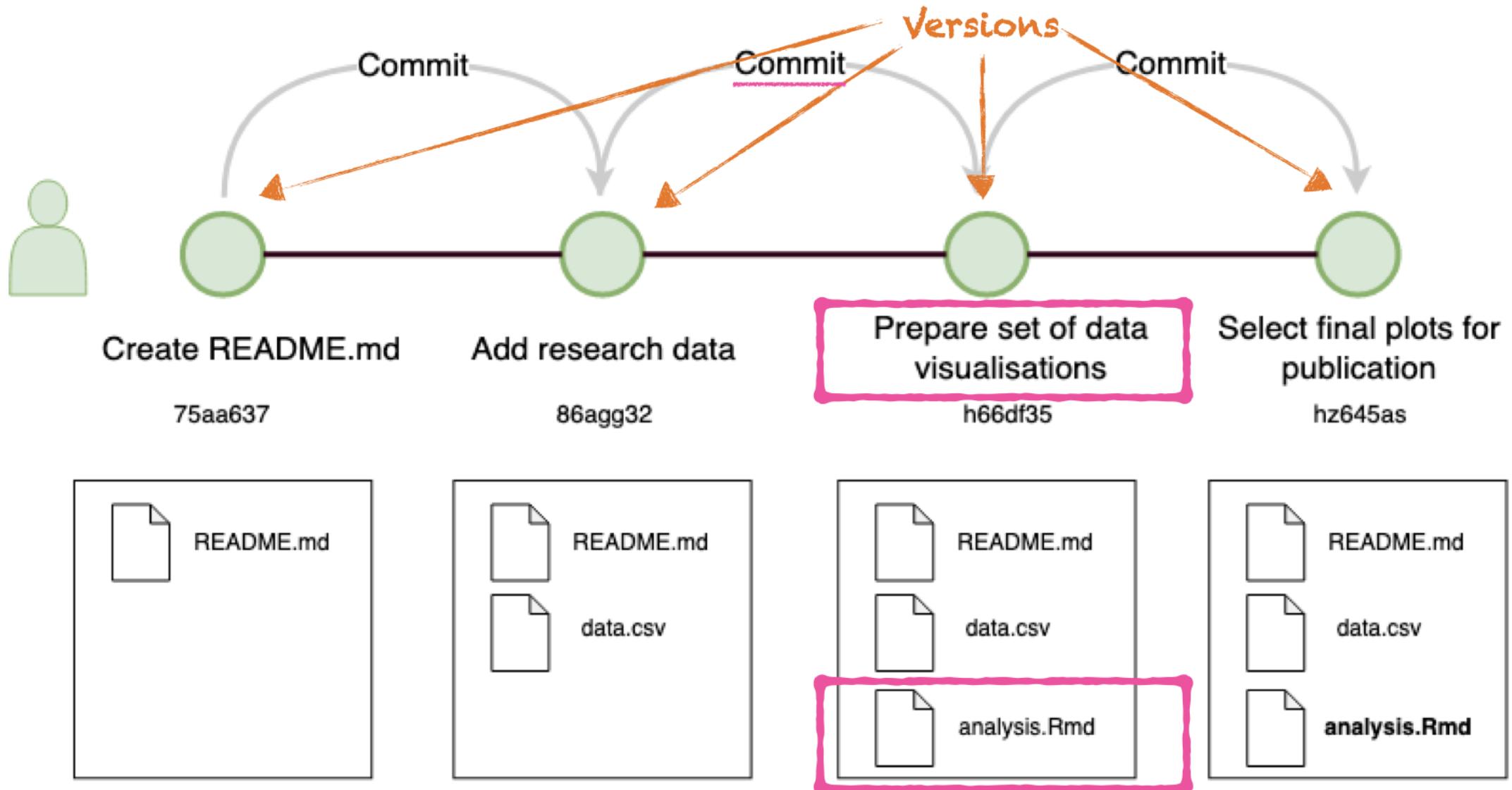


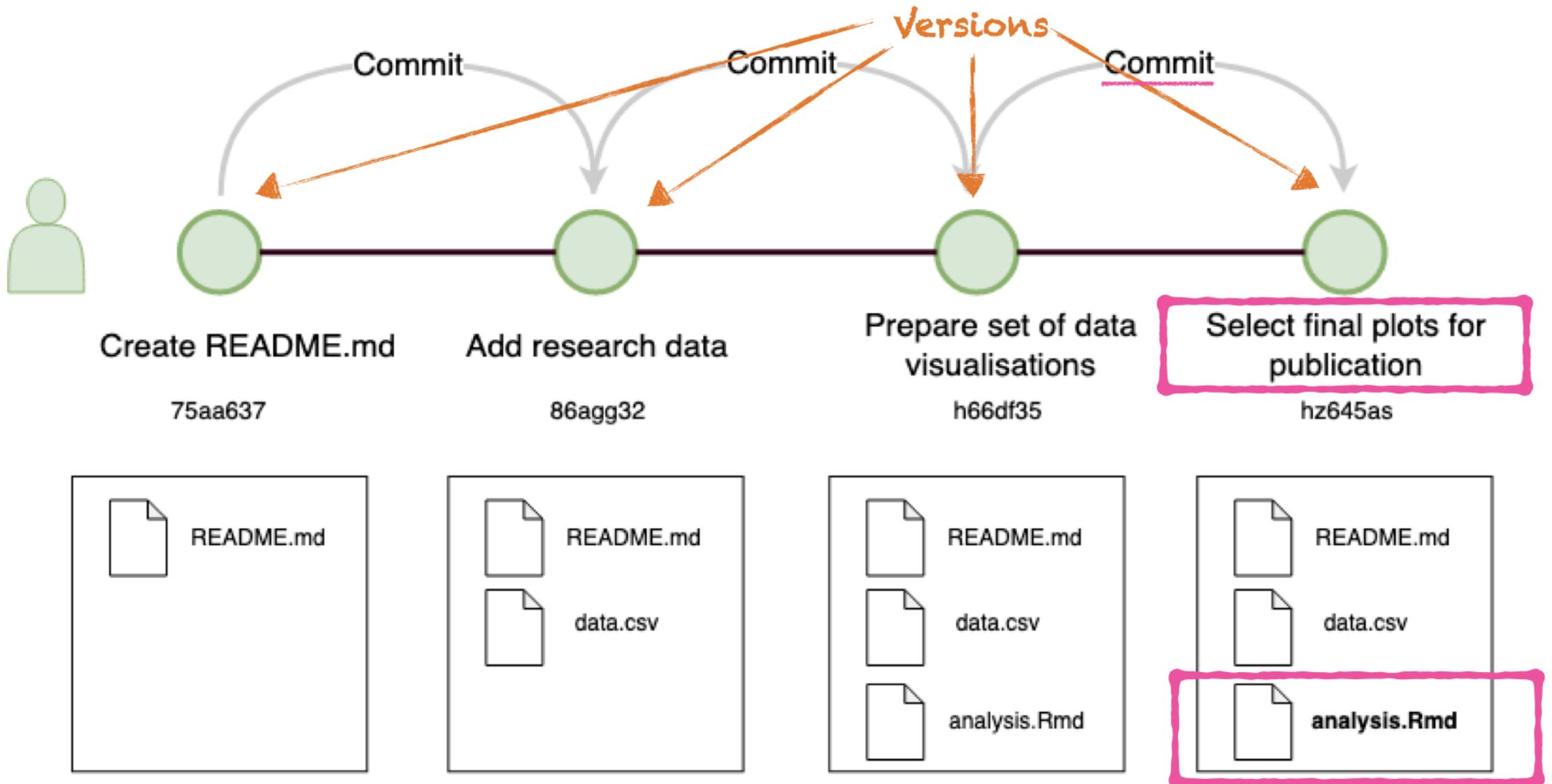
README.md

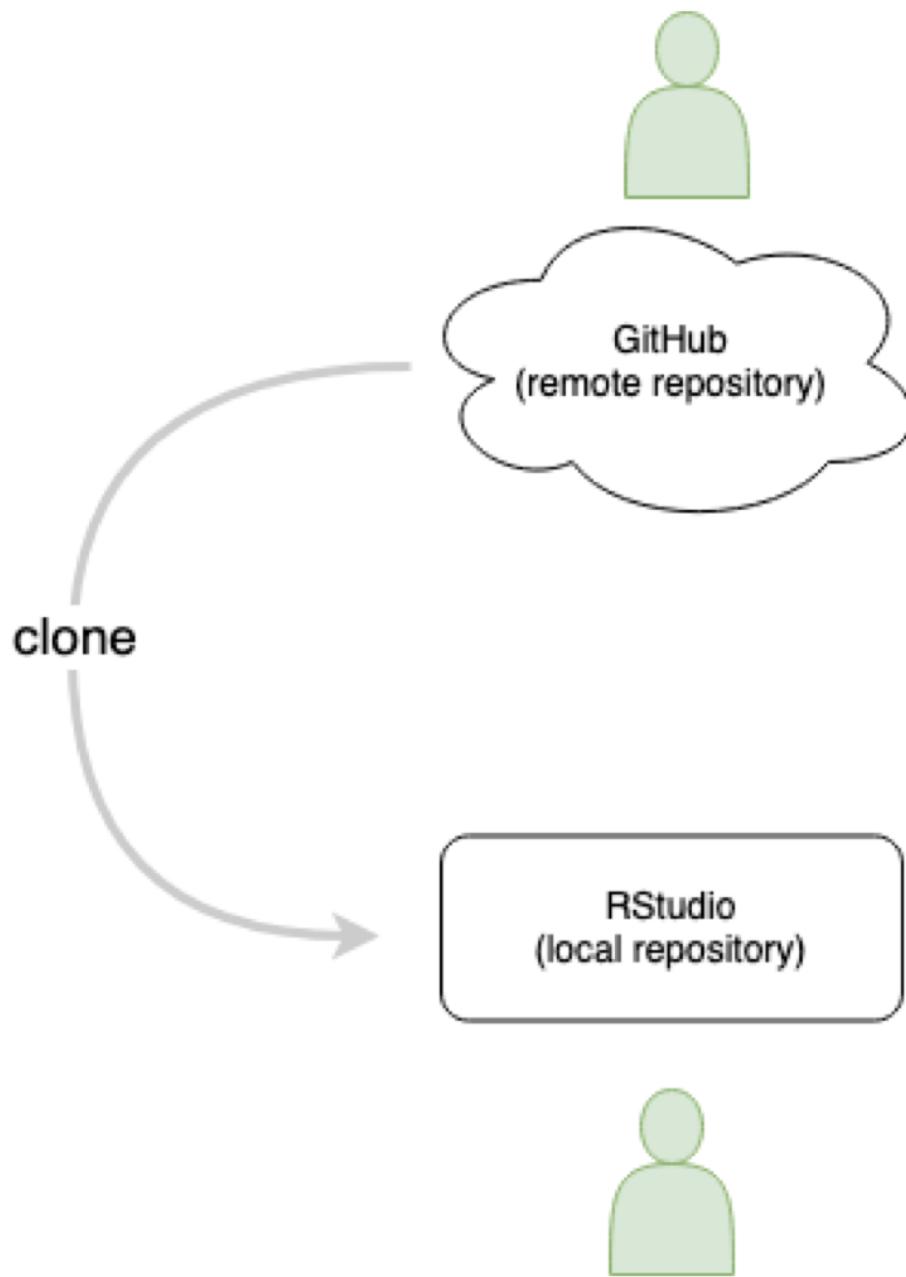


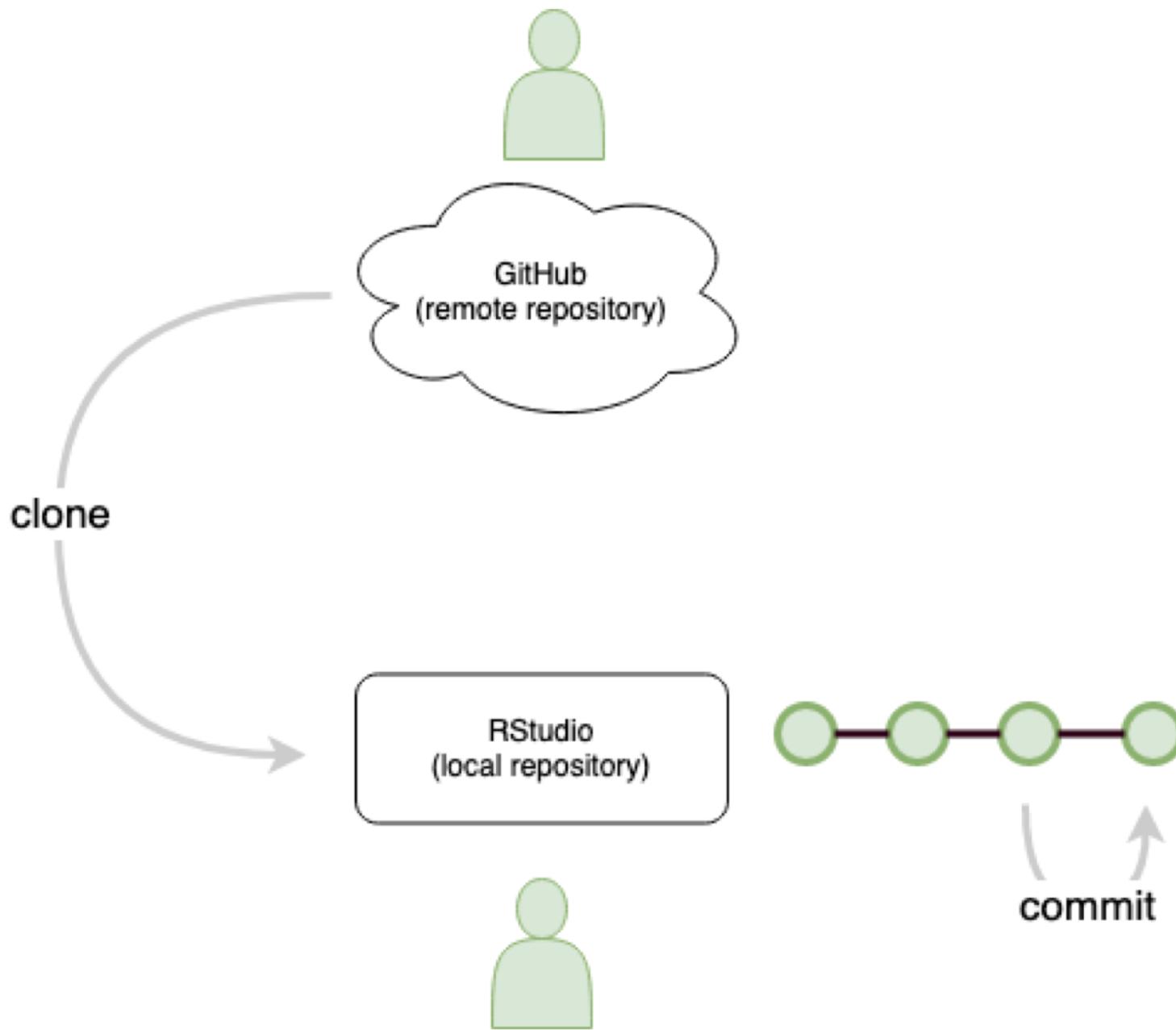
Repo(sitory)

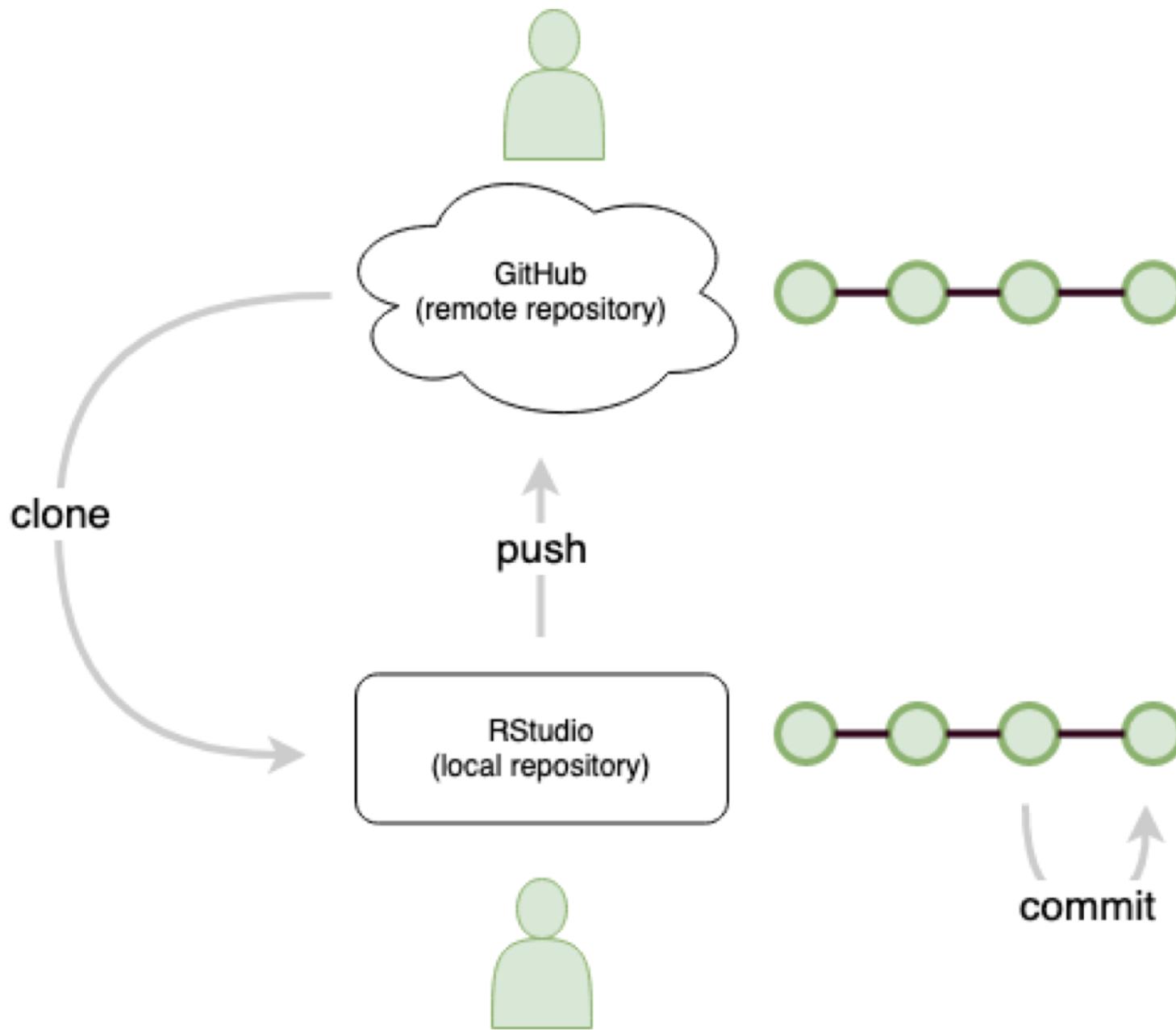












# RStudio

---

## RStudio Cloud & RStudio IDE

RStudio Cloud    +

https://rstudio.cloud/spaces/220982/project/3669638    120%    ⚡

Email rbtl

## Rbtl-fs22 / ae-02-air-quality-rainbow-train-fs22

RAM    Settings    More    rainbow-train-fs22

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function    Addins

R 4.1.2

man-air-quality-malawi-hospital.R... x

```
107 ggplot(data = dat_in_sum_day,
108   mapping = aes(x = date,
109     y = mean,
110       color = indicator)) +
111   geom_point(size = 0.2) +
112   geom_line() +
113   labs(title = "Hospital Air Quality",
114     subtitle = "Average 24-hour PM2.5 and PM10 concentrations at
115       eight locations") +
116   facet_wrap(~location) +
117   theme_bw(base_size = 12)
```

# Exercise 2: Learn to identify elements of a plot

R Markdown

Environment History Connections Git Tutorial

Import Dataset 342 MiB

Global Environment

Data

dat_in	203806 obs. of 6 variables
dat_in_sum_day	890 obs. of 8 variables

Values

dat_link	"https://raw.githubusercontent.com/Global-Health-Eng...
vec_hospital_name	chr [1:8] "6B" "Administration" "guardian" "Lhouse" ...

Console Terminal Jobs

R 4.1.2 · /cloud/project/ ↵

```
+ facet_wrap(~location) +
+ theme_bw(base_size = 12)
>
>
> ggplot(data = dat_in_sum_day,
+   mapping = aes(x = date,
+     y = mean,
+       color = indicator)) +
+   geom_point(size = 0.2) +
+   geom_line() +
+   labs(title = "Hospital Air Quality",
+     subtitle = "Average 24-hour PM2.5 and PM10 concentrations at eight loca
tions") +
+   facet_wrap(~location) +
+   theme_bw(base_size = 12)
```

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Cloud > project

Name	Size	Modified
..		
.gitignore	593 B	Mar 2, 2022, 1:49 PM
.Rhistory	0 B	Mar 2, 2022, 1:49 PM
ae-02-air-quality.Rproj	205 B	Mar 3, 2022, 10:09 AM
LICENSE.md	1 KB	Mar 2, 2022, 1:49 PM
manuscript		

**browser tab**

RStudio Cloud https://rstudio.cloud/spaces/220982/project/3669638 120% ⚡

R Email rbt1 RStudio Cloud Workspace RAM gear ⚡ rainbow-train-fs22

Rbt-fs22 / ae-02

**File Edit Code View Plots Session Build Debug Profile Tools Help**

**Addins**

man-air-quality-malawi-hospital.R... x

```
107
108 ggplot(data = dat_in_sum_day,
109   mapping = aes(x = date,
110     y = mean,
111     color = indicator)) +
112   geom_point(size = 0.2) +
113   geom_line() +
114   labs(title = "Hospital Air Quality",
115     subtitle = "Average 24-hour PM2.5 and PM10 concentrations at
116     eight locations") +
117   facet_wrap(~location) +
118   theme_bw(base_size = 12)
```

104:90 # Exercise 2: Learn to identify elements of a plot R Markdown

**Environment History Connections Git Tutorial**

Import Dataset 342 MiB List C

R Global Environment

Data

dat_in	203806 obs. of 6 variables
dat_in_sum_day	890 obs. of 8 variables

Values

dat_link	"https://raw.githubusercontent.com/Global-Health-Eng...
vec_hospital_name	chr [1:8] "6B" "Administration" "guardian" "Lhouse" ...

**Console Terminal Jobs**

R 4.1.2 · /cloud/project/ ↵

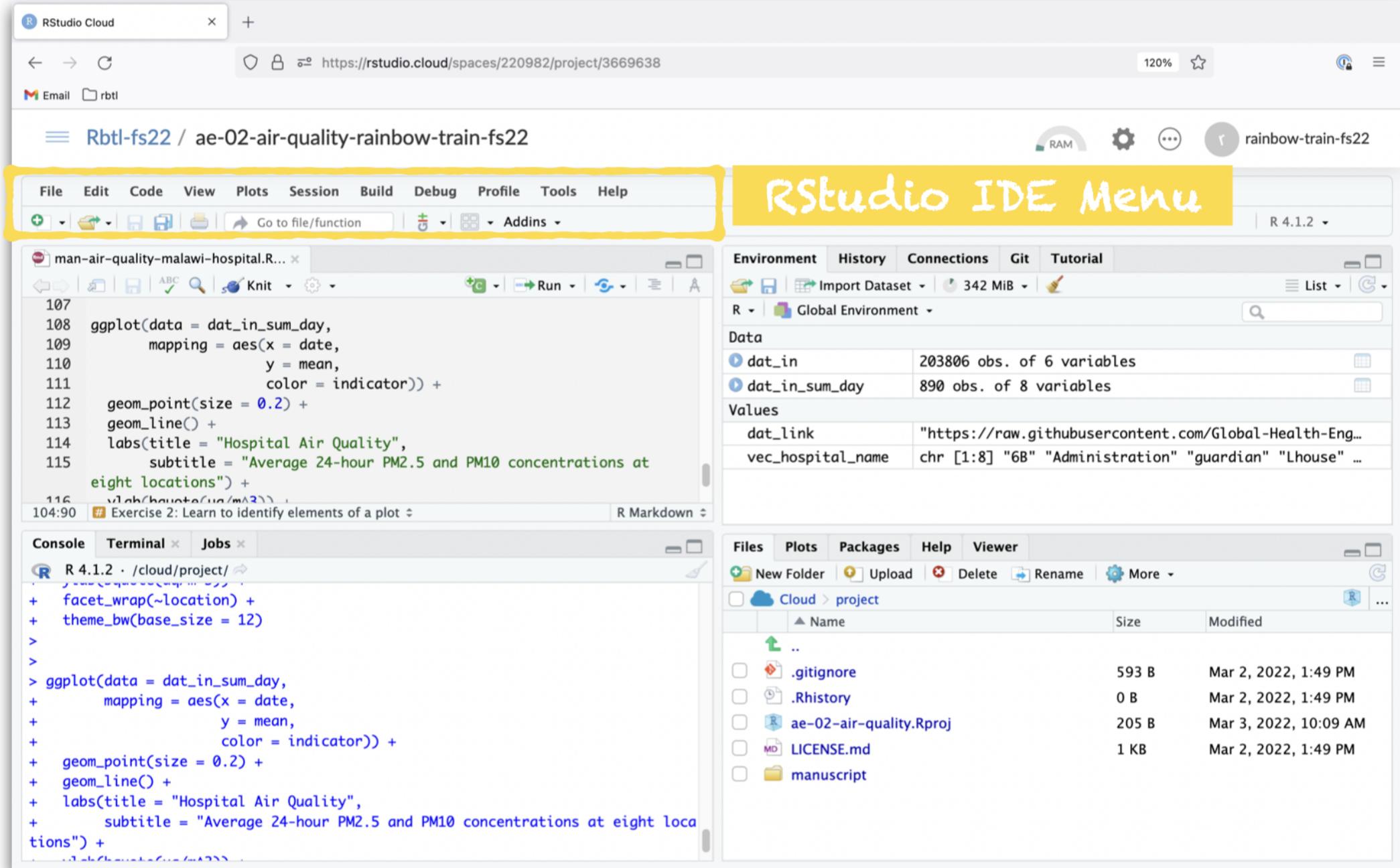
```
+ facet_wrap(~location) +
+ theme_bw(base_size = 12)
>
>
> ggplot(data = dat_in_sum_day,
+   mapping = aes(x = date,
+     y = mean,
+     color = indicator)) +
+   geom_point(size = 0.2) +
+   geom_line() +
+   labs(title = "Hospital Air Quality",
+     subtitle = "Average 24-hour PM2.5 and PM10 concentrations at eight loca
+     tions") +
+   facet_wrap(~location) +
+   theme_bw(base_size = 12)
```

**Files Plots Packages Help Viewer**

New Folder Upload Delete Rename More

Cloud > project

Name	Size	Modified
..	593 B	Mar 2, 2022, 1:49 PM
.gitignore	0 B	Mar 2, 2022, 1:49 PM
.Rhistory	205 B	Mar 3, 2022, 10:09 AM
ae-02-air-quality.Rproj	1 KB	Mar 2, 2022, 1:49 PM
LICENSE.md		
manuscript		



RStudio Cloud

https://rstudio.cloud/spaces/220982/project/3669638

120% ⚡

Email rbtl

RStudio IDE Menu

R 4.1.2

RAM

rainbow-train-fs22

File Edit Code View Plots Session Build Debug Profile Tools Help

Addins

man-air-quality-malawi-hospital.R... x

ABC Knit Run

Code Editor

107  
108 ggplot(data = dat\_in\_sum\_day,  
109 mapping  
110 geom\_point(size = 0.2) +  
111 geom\_line() +  
112 labs(title = "Hospital Air Quality",  
113 subtitle = "Average 24-hour PM2.5 and PM10 concentrations at  
114 eight locations") +  
115 # Exercise 2: Learn to identify elements of a plot

104:90 R Markdown

Console Terminal Jobs

R 4.1.2 · /cloud/project/ ↵

+ facet\_wrap(~location) +  
+ theme\_bw(base\_size = 12)  
>  
>  
> ggplot(data = dat\_in\_sum\_day,  
+ mapping = aes(x = date,  
+ y = mean,  
+ color = indicator)) +  
+ geom\_point(size = 0.2) +  
+ geom\_line() +  
+ labs(title = "Hospital Air Quality",  
+ subtitle = "Average 24-hour PM2.5 and PM10 concentrations at eight loca  
tions") +

Environment History Connections Git Tutorial

Import Dataset 342 MiB

Global Environment

Data

dat\_in 203806 obs. of 6 variables  
dat\_in\_sum\_day 890 obs. of 8 variables

Values

dat\_link "https://raw.githubusercontent.com/Global-Health-Eng...  
vec\_hospital\_name chr [1:8] "6B" "Administration" "guardian" "Lhouse" ...

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Cloud > project

Name	Size	Modified
..	593 B	Mar 2, 2022, 1:49 PM
.gitignore	0 B	Mar 2, 2022, 1:49 PM
.Rhistory	205 B	Mar 3, 2022, 10:09 AM
ae-02-air-quality.Rproj	1 KB	Mar 2, 2022, 1:49 PM
LICENSE.md		
manuscript		

RStudio Cloud

https://rstudio.cloud/spaces/220982/project/3669638

120% rainbow-train-fs22

Email rbtl

### RStudio IDE Menu

File Edit Code View Plots Session Build Debug Profile Tools Help

Addins

man-air-quality-malawi-hospital.R... x

ABC Knit Run

Code Editor

```
107  
108 ggplot(data = dat_in_sum_day,  
109     mapping  
110     geom_point(size = 0.2) +  
111     geom_line() +  
112     labs(title = "Hospital Air Quality",  
113         subtitle = "Average 24-hour PM2.5 and PM10 concentrations at  
114         eight locations") +  
115     facet_wrap(~location) +  
116     theme_bw(base_size = 12)  
104:90 # Exercise 2: Learn to identify elements of a plot
```

R Markdown

### Environment Git

Import Dataset 342 MiB

Global Environment

Data

- dat\_in
- dat\_in\_s

Values

- dat\_link "https://raw.githubusercontent.com/Global-Health-Eng...
- vec\_hospital\_name chr [1:8] "6B" "Administration" "guardian" "Lhouse" ...

Console Terminal Jobs

```
R 4.1.2 · /cloud/project/  
+ facet_wrap(~location) +  
+ theme_bw(base_size = 12)  
>  
>  
> ggplot(data = dat_in_sum_day,  
+     mapping = aes(x = date,  
+                     y = mean,  
+                     color = indicator)) +  
+     geom_point(size = 0.2) +  
+     geom_line() +  
+     labs(title = "Hospital Air Quality",  
+         subtitle = "Average 24-hour PM2.5 and PM10 concentrations at eight loca  
tions") +
```

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Cloud > project

Name	Size	Modified
..	593 B	Mar 2, 2022, 1:49 PM
.gitignore	0 B	Mar 2, 2022, 1:49 PM
.Rhistory	205 B	Mar 3, 2022, 10:09 AM
ae-02-air-quality.Rproj	1 KB	Mar 2, 2022, 1:49 PM
LICENSE.md		
manuscript		

RStudio Cloud

https://rstudio.cloud/spaces/220982/project/3669638

Email rbtl

Rbt-fs22 / ae-02-air-quality-rainbow-train-fs22

RAM  120%   

**RStudio IDE Menu**

File Edit Code View Plots Session Build Debug Profile Tools Help

Addins

man-air-quality-malawi-hospital.R... x

ABC Knit Run

Code Editor

```
107 ggplot(data = dat_in_sum_day,
108   mapping
110   geom_point(size = 0.2) +
111   geom_line() +
112   labs(title = "Hospital Air Quality",
113       subtitle = "Average 24-hour PM2.5 and PM10 concentrations at
114       eight locations") +
115   theme_bw(base_size = 12)
116 
```

# Exercise 2: Learn to identify elements of a plot

R Markdown

Environment History Connections Git Tutorial

Import Dataset 342 MiB

R Global Environment

Data

- dat\_in
- dat\_in\_s

Values

- dat\_link "https://raw.githubusercontent.com/Global-Health-Eng...
- vec\_hospital\_name chr [1:8] "6B" "Administration" "guardian" "Lhouse" ...

**Environment Git**

Console Terminal Jobs

R 4.1.2 · /cloud/project/

```
+ facet_wrap(~location) +
+ theme_bw(base_size = 12)
>
>
> ggplot(data = dat_in_sum_day,
+   mapping = aes(x = date,
+                 y = mean,
+                 color = indicator)) +
+   geom_point(size = 0.2) +
+   geom_line() +
+   labs(title = "Hospital Air Quality",
+       subtitle = "Average 24-hour PM2.5 and PM10 concentrations at eight locations") +
+   theme_bw(base_size = 12)
```

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Cloud > project

Name	Size	Modified
..		9 PM
.gitig		9 PM
.Rhist		
ae-02-air-quality.Rproj	205 B	Mar 3, 2022, 10:09 AM
LICENSE.md	1 KB	Mar 2, 2022, 1:49 PM
manuscript		

**File Manager**

The screenshot displays the RStudio Cloud interface with several panels highlighted by colored borders:

- Code Editor** (Yellow border): Shows an R Markdown script for creating a plot of hospital air quality. The code includes ggplot, geom\_point, and geom\_line layers, along with a title and subtitle. A placeholder text "Code Editor" is overlaid on the panel.
- RStudio IDE Menu** (Orange border): Shows the main menu bar (File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help) and the global environment pane. The environment pane lists variables like dat\_in, dat\_link, and vec\_hospital\_name. A placeholder text "Environment Git" is overlaid on the environment section.
- Console** (Pink border): Shows R command history and code execution. A placeholder text "Console" is overlaid on the panel.
- File Manager** (Green border): Shows the file structure in the current project directory. Files include .gitignore, .Rhistory, ae-02-air-quality.Rproj, LICENSE.md, and manuscript. A placeholder text "File Manager" is overlaid on the panel.

Other visible elements include the browser header with the URL https://rstudio.cloud/spaces/220982/project/3669638, a RAM usage indicator, and a gear icon for settings.



Photo by: Matt Walsh

Thanks! 🌻

Slides created via the R packages:

**xaringan**  
gadenbuie/xaringanthemer

The chakra comes from [remark.js](#), [knitr](#), and [R Markdown](#).

All material is licensed under [Creative Commons Attribution Share Alike 4.0 International](#).