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# RStudio Essentials

## Managing Change 2: Version Control



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# Series

- 1. Writing Code (12/2)**
- 2. Debugging Code (12/9)**
- 3. Writing Packages (12/16)**
- 4. Efficiency with Projects (1/6)**
- 5. Version control, collaboration with Git (1/20)**
- 6. Reproducibility with Packrat (2/3)**

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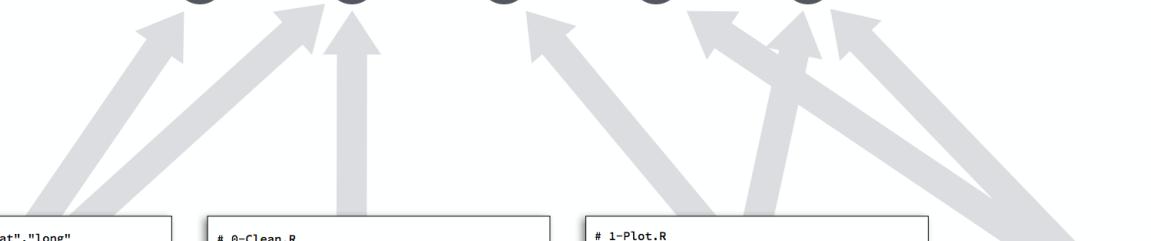
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# What is version control and why should you use it?



## History

1st Commit      2nd Commit      3rd Commit      4th Commit      5th Commit



```
"name", "year", "time", "lat", "long"
"Allison", 1995, 1995-06-03 00:00:00, 17.4, -84.3
"Allison", 1995, 1995-06-03 06:00:00, 18.3, -84.9
"Allison", 1995, 1995-06-03 12:00:00, 19.3, -85.7
"Allison", 1995, 1995-06-03 18:00:00, 20.6, -85.8
"Allison", 1995, 1995-06-04 00:00:00, 22, -86
"Allison", 1995, 1995-06-04 06:00:00, 23.3, -86.3
"Allison", 1995, 1995-06-04 12:00:00, 24.7, -86.2
"Allison", 1995, 1995-06-04 18:00:00, 26.2, -86.2
"Allison", 1995, 1995-06-05 00:00:00, 27.6, -86.1
"Allison", 1995, 1995-06-05 06:00:00, 28.5, -85.6
"Allison", 1995, 1995-06-05 12:00:00, 29.6, -84.7
"Allison", 1995, 1995-06-05 18:00:00, 30.7, -83.8
"Allison", 1995, 1995-06-06 00:00:00, 31.8, -82.8
"Allison", 1995, 1995-06-06 06:00:00, 32.7, -81.5
"Allison", 1995, 1995-06-06 12:00:00, 33.6, -80
"Allison", 1995, 1995-06-06 18:00:00, 34.5, -78.1
"Allison", 1995, 1995-06-07 00:00:00, 35.6, -75.9
"Allison", 1995, 1995-06-07 06:00:00, 37.1, -73.6
"Allison", 1995, 1995-06-07 12:00:00, 38.5, -71
"Allison", 1995, 1995-06-07 18:00:00, 39.8, -69.2
"Allison", 1995, 1995-06-08 00:00:00, 41, -67.7
"Allison", 1995, 1995-06-08 06:00:00, 42.4, -66
"Allison", 1995, 1995-06-08 12:00:00, 43.8, -63.7
```

```
# 0-Clean.R
library(dplyr)
library(lubridate)

storms <- read.csv("storms.csv")

storms <- storms %>%
  mutate(time = ymd_h(paste(year, month, day,
    hour))) %>%
  select(name, year, time, lat, long,
    pressure, wind, type)

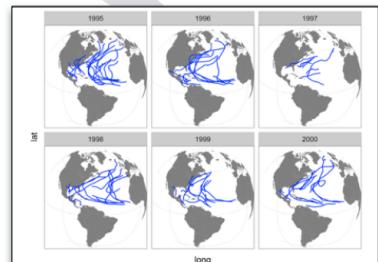
write.csv(storms, file = "storms.csv",
  row.names = FALSE)
```

```
# 1-Plot.R
library(ggplot2)
library(dplyr)

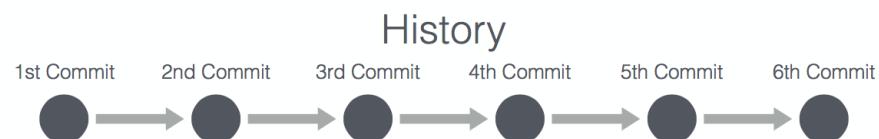
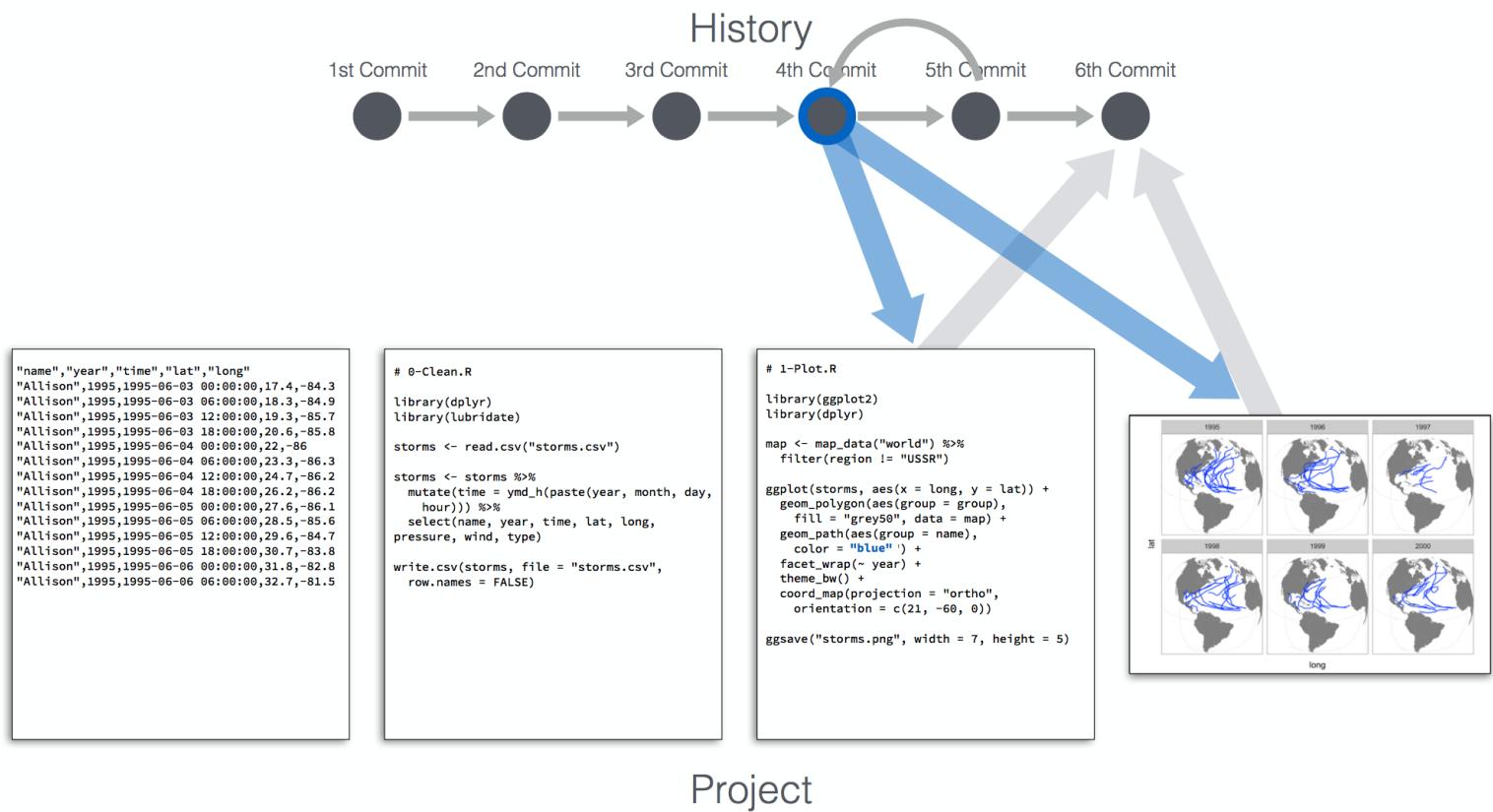
map <- map_data("world") %>%
  filter(region != "USSR")

ggplot(storms, aes(x = long, y = lat)) +
  geom_polygon(aes(group = group),
    fill = "grey50", data = map) +
  geom_path(aes(group = name),
    color = "blue") +
  facet_wrap(~ year) +
  theme_bw() +
  coord_map(projection = "ortho",
    orientation = c(21, -60, 0))

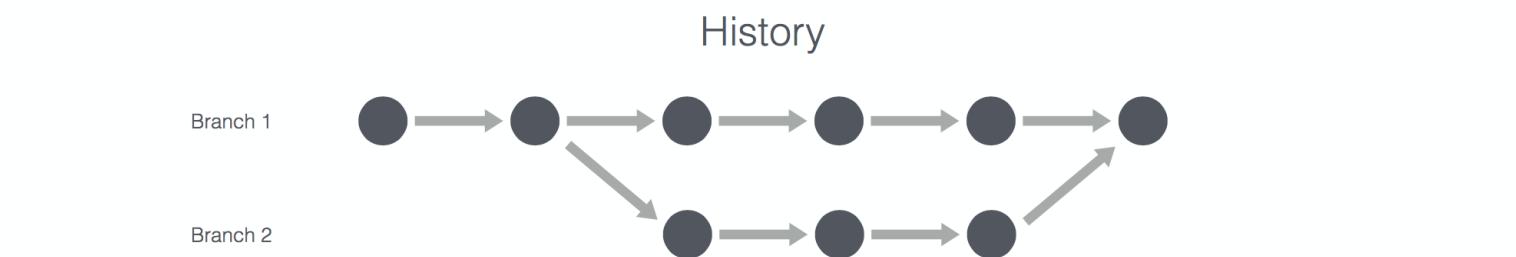
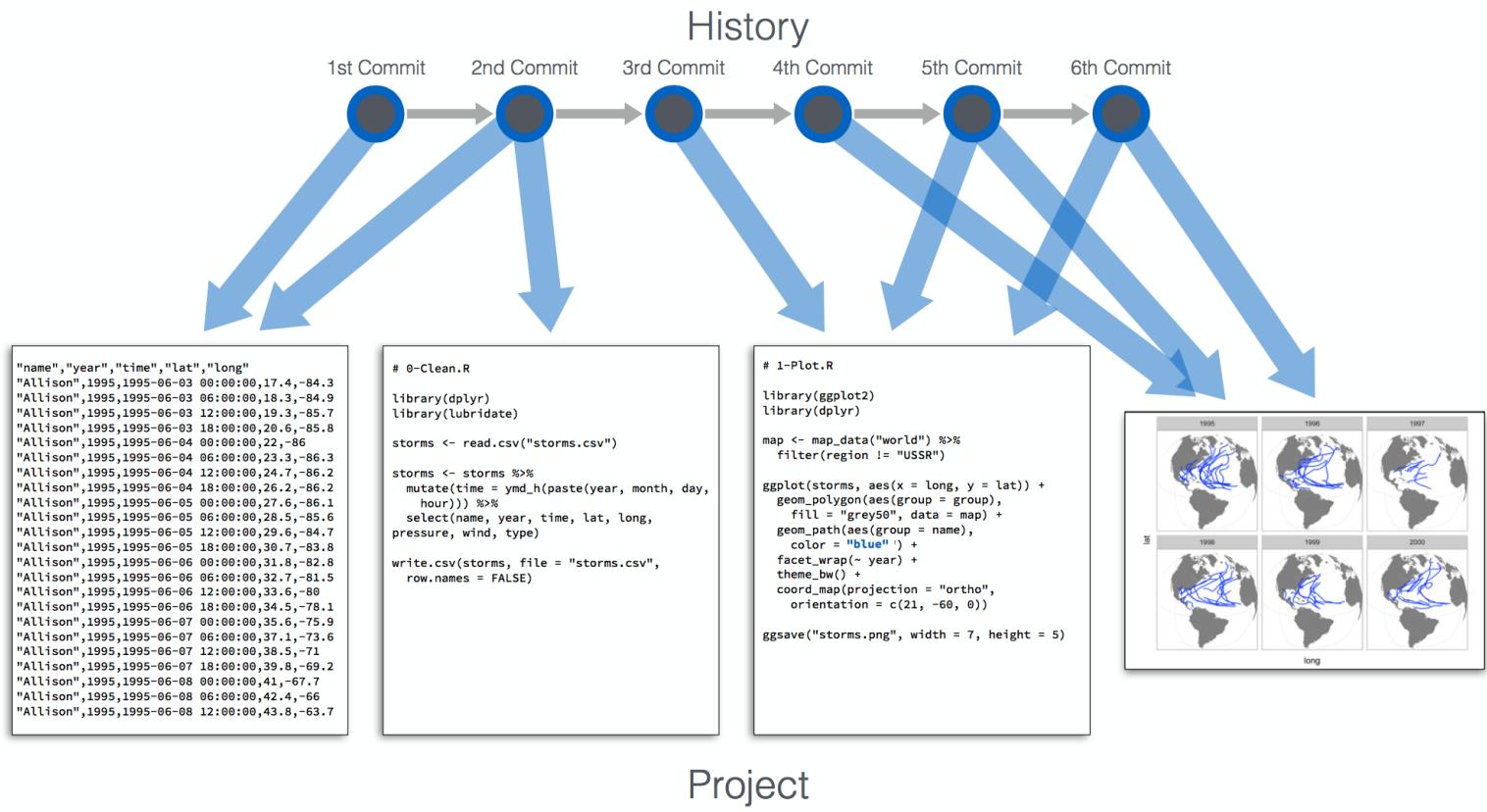
ggsave("storms.png", width = 7, height = 5)
```



## Project



.git



## "Official" Version implied by commit history

```
#code "year", "time", "lat", "lon"
"allison", 1995-1995-06-03 00:00:00, -17.4, -64.3
"allison", 1995-1995-06-03 00:00:00, 14.3, -64.9
"allison", 1995-1995-06-03 00:00:00, 14.3, -64.9
"allison", 1995-1995-06-03 00:00:00, 22.6, -65.0
"allison", 1995-1995-06-03 00:00:00, 22.6, -65.0
"allison", 1995-1995-06-04 00:00:00, 21.2, -66.3
"allison", 1995-1995-06-04 00:00:00, 21.2, -66.3
"allison", 1995-1995-06-04 00:00:00, 28.2, -66.2
"allison", 1995-1995-06-04 00:00:00, 28.2, -66.2
"allison", 1995-1995-06-05 00:00:00, 23.5, -65.6
"allison", 1995-1995-06-05 00:00:00, 23.5, -65.6
"allison", 1995-1995-06-06 00:00:00, 27.7, -65.1
"allison", 1995-1995-06-06 00:00:00, 27.7, -65.1
"allison", 1995-1995-06-06 00:00:00, 32.7, -65.5
"allison", 1995-1995-06-06 00:00:00, 32.7, -65.5
"allison", 1995-1995-06-06 00:00:00, 34.5, -65.1
"allison", 1995-1995-06-06 00:00:00, 34.5, -65.1
"allison", 1995-1995-06-07 00:00:00, 39.3, -65.2
"allison", 1995-1995-06-07 00:00:00, 39.3, -65.2
"allison", 1995-1995-06-08 00:00:00, 42.4, -65.7
"allison", 1995-1995-06-08 00:00:00, 42.4, -65.7
"allison", 1995-1995-06-08 00:00:00, 43.1, -65.7
"allison", 1995-1995-06-08 00:00:00, 43.1, -65.7

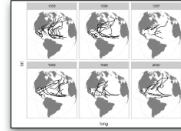
# 0-Clean.R
library(dplyr)
library(lubridate)

storms <- read.csv("storms.csv")

storms <- storms %>%
  mutate(time = ymd_h(paste(year,
  month, day)),
  hour = hour(time),
  select(name, year, time, lat,
  long, pressure, wind, type))

write.csv(storms, file =
  "storms.csv",
  row.names = FALSE)
```

```
# 1-Plot.R
library(ggplot2)
map <- map_data("world") %>%
  filter(region != "USSE")
ggplot(storms, aes(x = long, y =
  lat)) +
  geom_polygon(aes(group = group),
  fill = "grey50", data = map) +
  geom_path(aes(group = name),
  color = "blue") +
  facet_wrap(~ year) +
  theme_bw() +
  coord_map(projection = "ortho",
  orientation = c(22, -69, 0))
ggplot(storms.png", width = 7,
height = 5)
```



## Real Life Version uncommitted changes in blue

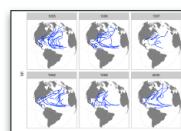
```
#code "year", "time", "lat", "lon"
"allison", 1995-1995-06-03 00:00:00, -17.4, -64.3
"allison", 1995-1995-06-03 00:00:00, 14.3, -65.0
"allison", 1995-1995-06-03 00:00:00, 22.6, -65.0
"allison", 1995-1995-06-04 00:00:00, 21.2, -66.3
"allison", 1995-1995-06-04 00:00:00, 21.2, -66.3
"allison", 1995-1995-06-05 00:00:00, 28.2, -66.2
"allison", 1995-1995-06-05 00:00:00, 28.2, -66.2
"allison", 1995-1995-06-06 00:00:00, 32.7, -65.6
"allison", 1995-1995-06-06 00:00:00, 32.7, -65.6
"allison", 1995-1995-06-06 00:00:00, 34.5, -65.1
"allison", 1995-1995-06-06 00:00:00, 34.5, -65.1
"allison", 1995-1995-06-06 00:00:00, 39.3, -65.2
"allison", 1995-1995-06-06 00:00:00, 39.3, -65.2
"allison", 1995-1995-06-07 00:00:00, 42.4, -65.7
"allison", 1995-1995-06-07 00:00:00, 42.4, -65.7
"allison", 1995-1995-06-08 00:00:00, 43.1, -65.7
"allison", 1995-1995-06-08 00:00:00, 43.1, -65.7

# 0-Clean.R
library(dplyr)
library(lubridate)

storms <- storms %>%
  mutate(time = ymd_h(paste(year,
  month, day)),
  hour = hour(time),
  select(name, year, time, lat,
  long, pressure, wind, type))

write.csv(storms, file =
  "storms.csv",
  row.names = FALSE)
```

```
# 1-Plot.R
library(ggplot2)
map <- map_data("world") %>%
  filter(region != "USSE")
ggplot(storms, aes(x = long, y =
  lat)) +
  geom_polygon(aes(group = group),
  fill = "grey50", data = map) +
  geom_path(aes(group = name),
  color = "blue") +
  facet_wrap(~ year) +
  theme_bw() +
  coord_map(projection = "ortho",
  orientation = c(22, -69, 0))
ggplot(storms.png", width = 7,
height = 5)
```



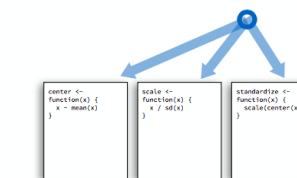
# GitHub

[www.github.com](http://www.github.com)

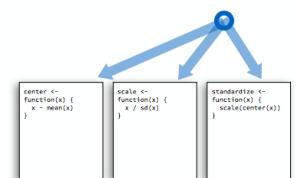


```
center <-  
function(x) {  
  x - mean(x)  
}  
  
scale <-  
function(x) {  
  x / sd(x)  
}  
  
standardize <-  
function(x) {  
  scale(center(x))  
}
```

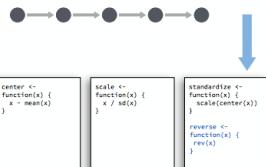
You



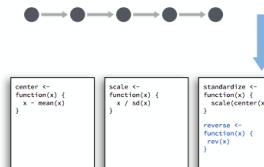
Collaborator 1



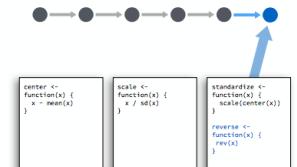
Collaborator 2



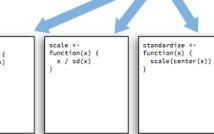
You



Collaborator 1

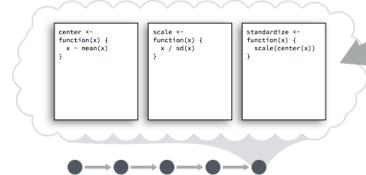


Collaborator 2



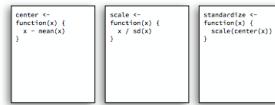
### 3. Github Version

available to public



### 2."Official" Version

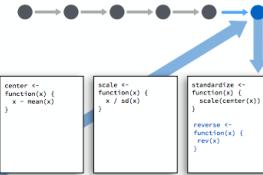
implied by commit history



You

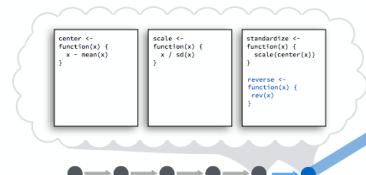


**GitHub**



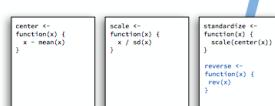
### 3. Github Version

available to public



### 2."Official" Version

implied by commit history

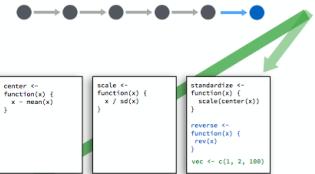


push

You

### 1.Real Life Version

in your working directory



### 3. Github Version

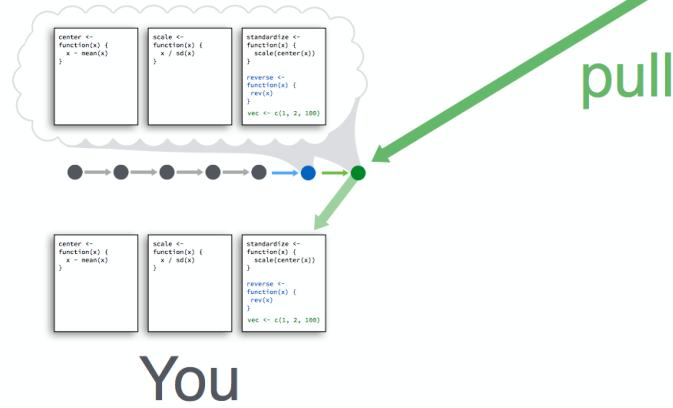
available to public

### 2. "Official" Version

implied by commit history

### 1. Real Life Version

in your working directory



You



<https://www.sourcetreeapp.com/>

# GitUp

<http://gitup.co/>



# RStudio IDE Cheatsheet

[www.rstudio.com/resources/cheatsheets/](http://www.rstudio.com/resources/cheatsheets/)

**1 LAYOUT**

Windows/Linux	Mac
Move focus to Source Editor	Cmd+1
Move focus to Console	Cmd+2
Move focus to Help	Cmd+3
Show history	Cmd+4
Show Files	Cmd+5
Show Packages	Cmd+6
Show Environment	Cmd+7
Show GR/SN	Cmd+8
Show Help	Cmd+9

**2 WRITE CODE**

Windows/Linux	Mac
Attempt Completions	Alt+Space
Navigate candidates	Up+Down
Accept candidate	Enter, Tab, or ⌘
Dismiss candidates	Esc+Delete
Execute Tab, or ⌘	Cmd+Tab
Ctrl+Shift+Space	Cmd+Shift+Space

**3 EXECUTE CODE**

Windows/Linux	Mac
Toggle Breakpoint	F9
Execute Next Line	F10
Step Into Function	Shift+F4
Continue/Stop/Loop	Shift+F5
Stop Execution	Shift+F6

**4 DEBUGGING**

Windows/Linux	Mac
Show diff	Cmd+Shift+D
Show Changes	Cmd+Shift+C
Scroll diff view	Cmd+Shift+S
Stage/Unstage (Git)	Cmd+Shift+G

**5 VERSION CONTROL**

Windows/Linux	Mac
Build and Reload	Cmd+Shift+B
Commit (Git)	Cmd+Shift+K
Test Package (Desktop)	Cmd+Shift+T
Test Package (Web)	Cmd+Shift+W
Document Package	Cmd+Shift+O

**6 DOCUMENTS AND APPS**

Windows/Linux	Mac
Open Document	Cmd+Shift+O
Close Document	Cmd+Shift+X
Find Document (new)	Cmd+Shift+F
Compile Notebook	Cmd+Shift+N
Insert Notebook	Cmd+Shift+N
Run current (retain)	Cmd+Shift+R
Run current after cursor	Cmd+Shift+R
Source a file	Cmd+Shift+S
Source current file	Cmd+Shift+Shift+S
Source with echo	Cmd+Shift+E

**7 MAKE PACKAGES**

Windows/Linux	Mac
Create reproducible package	Cmd+Shift+P
Package	Cmd+Shift+P
Delete selected	Cmd+Shift+Delete
Run current code section	Cmd+Shift+R
Run previous Sweave/Rmd code	Cmd+Shift+Shift+R
Run next chunk	Cmd+Shift+N
Sync Editor & PDF Preview	Cmd+Shift+F

**8 SHOW KEYBOARD SHORTCUTS**

Windows/Linux	Mac
Show Keyboard Shortcuts	Alt+Shift+H

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