

# R Markdown Workshop

## Reproducible Reports with R Markdown

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Open and inspect the file  
demo-header.Rmd

# Cross Reference

- When you make a header via Rmd

```
# Some Header
```

an **id is created automatically.**

- The id is created by replacing **space with –** and making it **all lower case**.
- Now you can link to this header by [some text](#some-header).
- Cross references work for both pdf and html outputs.

## Demo: header cross-references

```
library(tidyverse)  
library(knitr)
```

### A look at iris

Let's have a look at the `iris` data set. The dataset contains 150 observations. We'll also have a look at some chicken weights later.

### Count

```
iris %>%  
  group_by(Species) %>%  
  count(name = "Count")
```

Species	Count
setosa	50
versicolor	50
virginica	50

# Direct Reference for html

- For html output, you can also give a link directly to the relevant section
- E.g. open `demo-header.html` in a web browser
- Append say `#chicken-data` to the url. It should look like
  - `demo-header.html#chicken-data`
- It should have taken you straight to the corresponding header 

# User-defined id

- You can define your own id by appending {#your-id}.

```
# Some header {#header1}
```

- Now you can link to this header with the id header1.
- Note there should be no space in the id name!



Open and inspect the file  
demo.bib

# Bibliography

---

BibTeX citation style format is used to store references in .bib files.

Remember that you can get most BibTeX citation for R packages citation function. (Scroll below to see the BibTeX citation).

```
citation("xaringan")
```

To cite package 'xaringan' in publications use:

Yihui Xie (2019). xaringan: Presentation Ninja. R package version 0.9. <https://CRAN.R-project.org/package=xaringan>

A BibTeX entry for LaTeX users is

```
@Manual{,  
  title = {xaringan: Presentation Ninja},  
  author = {Yihui Xie},  
  year = {2019},  
  note = {R package version 0.9},  
  url = {https://CRAN.R-project.org/package=xaringan},
```



Open, inspect and knit the file  
demo-citation.Rmd

# Citations

- You can include BibTeX by specifying the `bib` file at YAML as:

`bibliography: bibliography.bib`

`[@bibtex-key] → (Author et al. 2019)`

or

`@bibtex-key → Author et al. 2019`

- See `demo-citation.Rmd`

# Figure References

- Support for figure references are included for output format type `bookdown::pdf_document2` for pdf or `bookdown::html_document2` for html.

```
```{r plot1, fig.cap = "Caption"}  
ggplot(cars, aes(dist, speed)) + geom_point()  
```
```

- Above figure number can be referenced as  
`\@ref(fig:plot1)`
- The reference label has the prefix `fig:` before the chunk label.

# Table References

- Support for table references are also included for output format type `bookdown::pdf_document2` for pdf or `bookdown::html_document2` for html.

```
```{r table1}
knitr::kable(cars, booktabs = TRUE, caption = "Caption")
````
```

- Above table number can be referenced as  
`\@ref(tab:table1)`
- The reference label has the prefix `tab:` before the chunk label.

# Markdown for Captions

```
```{r plot1, fig.cap = "(ref:label)"}
ggplot(cars, aes(dist, speed)) + geom_point()
```
```

- Then the caption can be entered in a separate paragraph with empty lines above and below it

(ref:label) This is the *\*caption\** with **\*\*markdown\*\***.

- You can substitute label with another unique label composed of alphanumeric characters, :, -, or /
- This caption supports markdown syntax
- This is great for long captions
- It also works for tables!

🔧 Open and work through  
challenge-12-references.Rmd

# Parametrized Report

```
---
```

```
title: "Parameterized Report"
```

```
params:
```

```
  species: setosa
```

```
output: html_document
```

```
---
```

```
```{r, message = FALSE, fig.dim = c(3,2)}
```

```
library(tidyverse)
```

```
iris %>%
```

```
  filter(Species==params$species) %>%
```

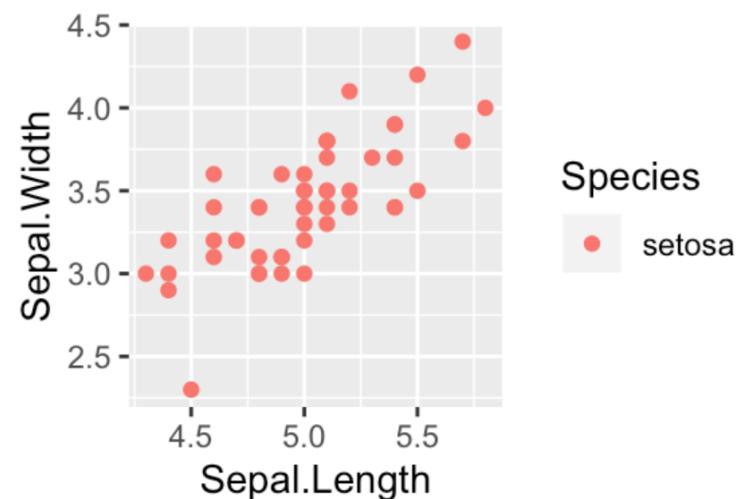
```
  ggplot(aes(Sepal.Length, Sepal.Width))
```

```
  geom_point(aes(color=Species))
```

output

## Parameterized Report

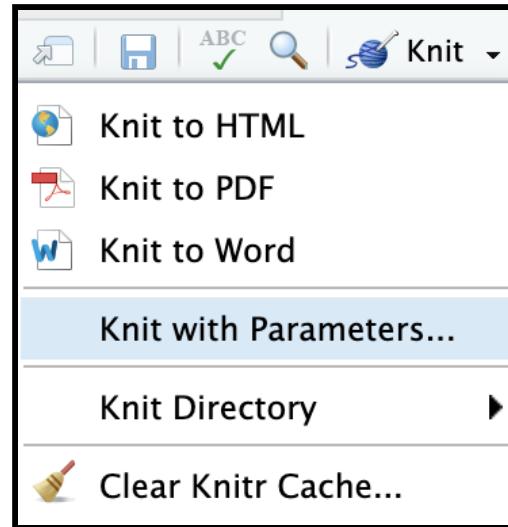
```
library(tidyverse)  
iris %>%  
  filter(Species==params$species) %>%  
  ggplot(aes(Sepal.Length, Sepal.Width)) +  
  geom_point(aes(color=Species))
```



# Knit with Parameters

```
---
```

```
title: "Parameterized Report"
params:
  species:
    label: "Species"
    value: setosa
    input: select
    choices: [setosa, versicolor, virginica]
  color: red
  max:
    label: "Maximum Sepal Width"
    value: 4
    input: slider
    min: 4
    max: 5
    step: 0.1
  output: html_document
---
```

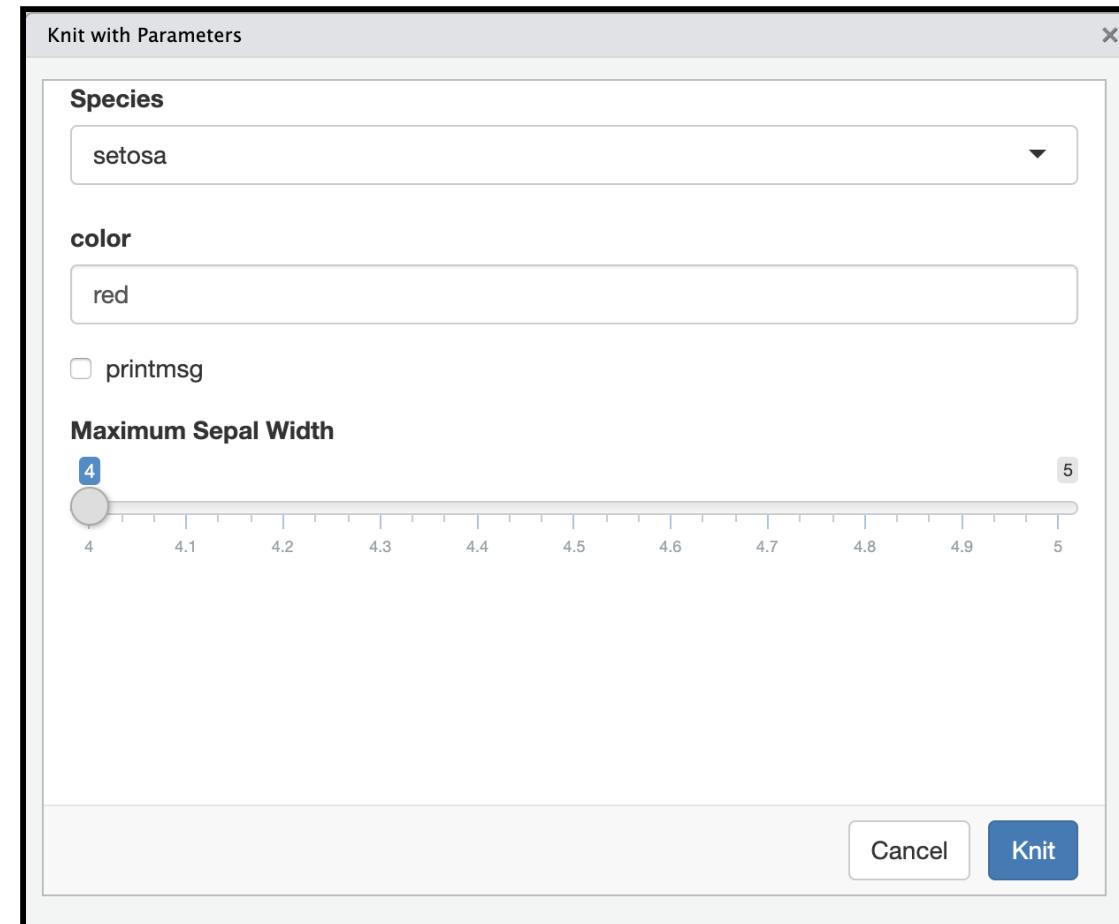


```
```{r, message = params$printmsg}
library(tidyverse)
iris %>%
  filter(Species==params$species) %>%
  filter(Sepal.Width < params$max) %>%
  ggplot(aes(Sepal.Length, Sepal.Width)) +
  geom_point(color = params$color) +
  labs(title = params$species)
```
```

# Shiny Report Generator

```
---
```

```
title: "Parameterized Report"
params:
  species:
    label: "Species"
    value: setosa
    input: select
    choices: [setosa, versicolor, virginica]
  color: red
  max:
    label: "Maximum Sepal Width"
    value: 5
    input: slider
    min: 4
    max: 5
    step: 0.05
output: html_document
---
```



🔧 Open and work through  
challenge-13-params.Rmd

# R Markdown via Command Line

demo-render.Rmd

---

title: "Parameterized Report"

params:

  species: setosa

output: html\_document

---

```
```{r, message = FALSE, fig.dim = c(3,2)}
library(tidyverse)
iris %>%
  filter(Species==params$species) %>%
  ggplot(aes(Sepal.Length, Sepal.Width)) +
  geom_point(aes(color=Species))
```
```

You can knit this file via R command by using the `render` function:

```
library(rmarkdown)
render("demo-render.Rmd")
```

You can overwrite the YAML values by supplying arguments to `render`:

```
library(rmarkdown)
render("demo-render.Rmd",
       output_format = "pdf_document",
       params = list(species = "virginica"))
```

 Open and work through  
challenge-14-letters.Rmd

# Themes: html\_document

You can change the look of the html document by specifying themes:

- default 
  - cerulean 
  - journal 
  - flatly 
  - darkly 
  - readable 
  - spacelab 
  - united 
  - cosmo 
  - lumen 
  - paper 
  - sandstone 
  - simplex 
  - yeti 
  - NULL 
- output:  
html\_document:  
theme: cerulean
- These bootswatch themes attach the whole bootstrap library which makes your html file size larger.

# prettydoc

prettydoc 📦 is a community contributed theme that is light-weight:

- cayman 📄
- tactile 📄
- architect 📄
- leonids 📄
- hpstr 📄

output:

```
prettydoc::html_pretty:  
  theme: cayman
```

See more about it below:

<https://prettydoc.statr.me/>

# rmdformats

rmdformats 📦 contains four built-in html formats:

- `readthedown` 
- `html_clean` 
- `html_docco` 
- `material` 

You can use these formats by simply specifying the output in YAML as below:

```
output: rmdformats::readthedown
```

See more about it below:

<https://github.com/juba/rmdformats>

# rticles - LaTeX Journal Article Templates

- acm 
- acs 
- aea 
- agu 
- amq 
- ams 
- asa 
- biometrics 
- copernicus 
- elsevier 
- frontiers 
- ieee 
- jss 
- mdpi 
- mnras 
- peerj 
- plos 
- pnas 
- rjournal 
- rsos 
- rss 
- sage 
- sim 
- springer 
- tf 

Go to RStudio > File > New File > R Markdown ... > From Template

# External Files in Templating

- When using `rticles`, each journal usually require external files (e.g. `cls` or image files).
- These external components are stored within the package.
- So use `draft` instead of `render`!

## GUI

- RStudio > File > New File > R Markdown ... > From Template

## Command line

```
rmarkdown::draft("file.Rmd",  
  template = "biometrics_article",  
  package = "rticles")
```

# Making your own R Markdown template

- You need to make an R package first!  
Go to RStudio > New Project > New Directory > R Package or `usethis::create_package()`
- When you are in your R package project,

```
usethis::use_rmarkdown_template("⟨Name⟩")
```

- Modify the `skeleton/skeleton.Rmd` to how you want and add all external files to the `skeleton` folder.
- Install your package.
- 🎉 And now find it at RStudio > File > New File > R Markdown > From Template.



Create your own  
R Markdown Template Package!

# Session Information

---

```
devtools::session_info()
```

– Session info

---

setting value

version R version 3.6.0 (2019-04-26)

os macOS Mojave 10.14.6

system x86\_64, darwin15.6.0

ui X11

language (EN)

collate en\_AU.UTF-8

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