

R Markdown Workshop

Reproducible Reports

Presented by Emi Tanaka

School of Mathematics and Statistics



THE UNIVERSITY OF
SYDNEY



dr.emi.tanaka@gmail.com



@statsgen

These slides are viewed best by Chrome and occasionally need to be refreshed if elements did not load properly. See here for PDF [\[link\]](#)

19th Nov 2019 @ SSA Vic | Melbourne, Australia



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-08-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) %>%
```

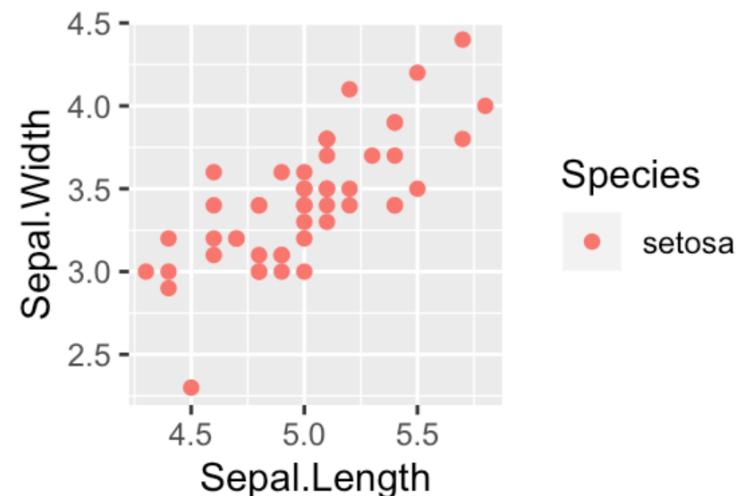
```
 ggplot(aes(Sepal.Length, Sepal.Width))
```

```
 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))
```



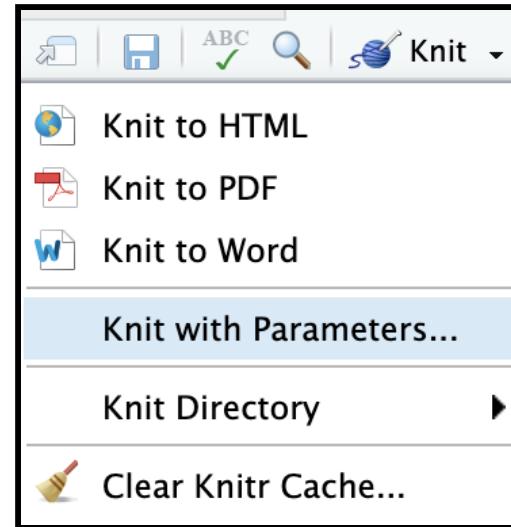
# Knit with Parameters

```

```

```
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)
```
```

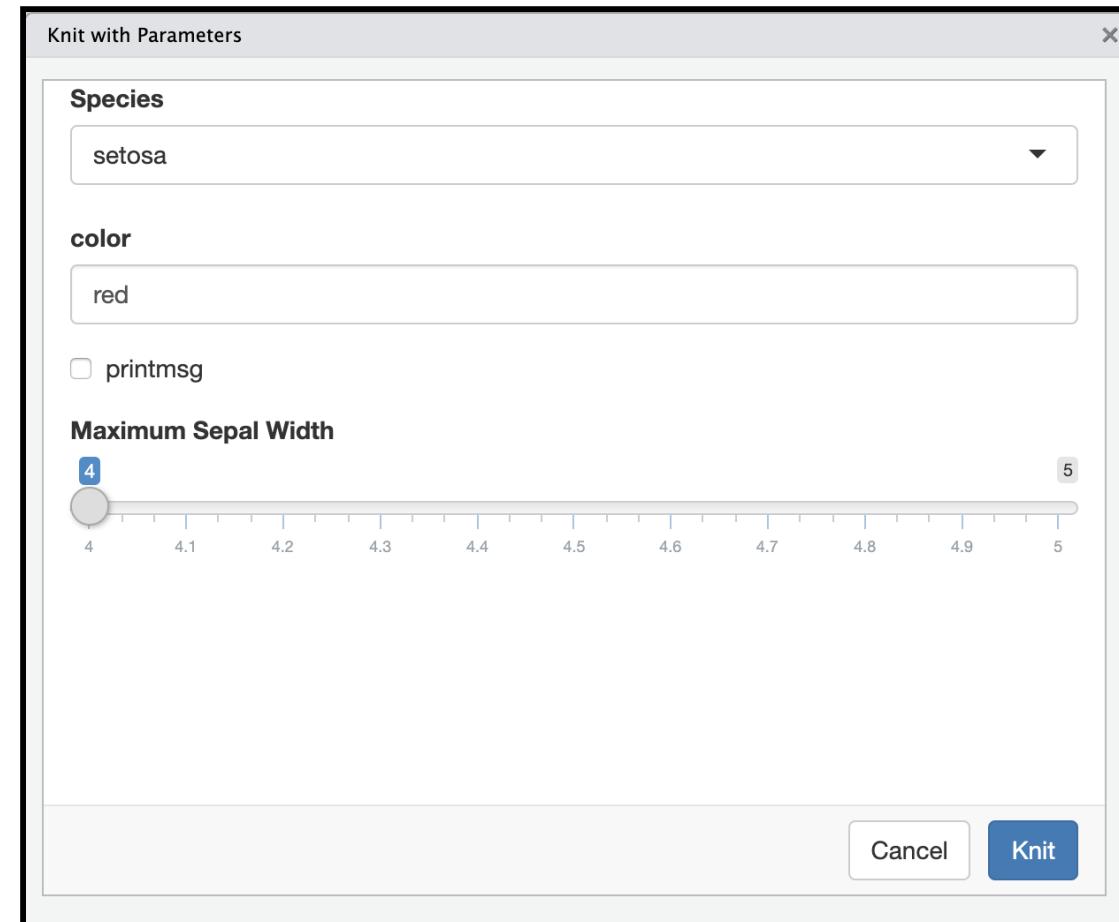
# Shiny Report Generator

```

```

```
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-09-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-10-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)

These slides are licensed under

