

2017-01-30-reproducible-workflows

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Objectives

- Learn how to render multiple output formats from a single R Markdown file

Use cases

- You want to give a talk based on your analysis
- You want to give a collaborator a report on your analysis in a format they prefer
- You don't want to duplicate effort

Output options

- Document
 - HTML
 - * Embedded or non-embedded figures
 - MS Word
 - PDF

Output options

- Presentation
 - HTML (ioslides)
 - HTML (Slidy)
 - PDF (Beamer)

Output options

- Shiny (interactive document)
 - Document
 - Presentation (ioslides)

All in your head(er)

- RMarkdown documents have header text written in YAML
- YAML = YAML Ain't Markup Language

```
--- title: "One Code to Rule Them All" author: "Rick O. Gilmore" date: "July 4, 1776"
output: html_document ---
```

Default output is `html_document`

- `rmarkdown::render(input = "my-report.Rmd")` creates a single HTML file
- The `output: html_document` line specifies the default format for the file
- Omitting the `output:` or `author:` or `date:` commands still yields an HTML file

Getting fancier

- `rmarkdown::render()` can take an `output_format` parameter
- `rmarkdown::render(input = "my-report.Rmd", output_format = "html_document")` renders an HTML file as before
- `rmarkdown::render(input = "my-report.Rmd", output_format = "word_document")` renders an MS Word document
- `rmarkdown::render(input = "my-report.Rmd", output_format = "pdf_document")` renders a PDF document

```
rmarkdown::render(input = "my-report.Rmd", output_format = "html_document") rmarkdown::render(input = "my-report.Rmd", output_format = "word_document") rmarkdown::render(input = "my-report.Rmd", output_format = "pdf_document")
```

Or, just

```
rmarkdown::render(input = "my-report.Rmd", output_format = c("html_document", "word_document", "pdf_document"))
```

makes all three with **one** command.

Y'all can customize your YAML

- Default `html_document` output creates a single HTML file with all figures embedded via
 - `self_contained: true`
- Nice for sharing a single file with collaborators
- Not so if you want to save the figures for other uses
- If `self_contained: false`, then figures are written to separate directory

```
--- title: "One Code to Rule Them All" author: "Rick O. Gilmore" date: "July 4, 1776"
output: html_document: self_contained: false ---
```

Exploring report parameters

Presentations

- HTML (ioslides)
- HTML (Slidy)
- PDF (Beamer)

ioslides basics

- New slides with titles start with double-hashtags

`## New Slide Title`

- New slides without titles start with four dashes

`----`

ioslides basics

- Bullet points start with single dashes

`- Bulleted item 1 - Bulleted item 2`

- if `incremental: FALSE` in YAML header (the default), then

`>- Incremental bullet`

allows you to show one bullet at a time for that slide

ioslides basics

- Embedding figures requires some HTML

`` embeds

- Embedding videos depends on source
 - YouTube provides code
 - Embedding other (even local) videos requires HTML

ioslides formatting

`<div class="centered">`

`...`

`</div>`

Centers items between the `<div>` and `<\div>` tags vertically.

Rendering ioslides

```
--- title: "One Code to Rule Them All" author: "Rick O. Gilmore" date: "July 4, 1776"
output: ioslides_presentation ---
```

in your file header, or

```
rmarkdown::render(input = "my-report.Rmd", output_format = "ioslides_presentation")
```

on the fly.

Parameters for ioslides

`incremental: false`

Turns off incremental reveal of bullets.

`widescreen: true`

Makes slides work well with 16:9 aspect ratio screens.

Documents

- HTML documents, `output_format="html_document"`
- MS Word documents, `output_format="word_document"`
- PDF documents, `output_format="pdf_document"`

MS Word document basics

See http://rmarkdown.rstudio.com/word_document_format.html

```
---
...
output:
  word_document:
    fig_width: 5
    fig_height: 5
    fig_caption: false
    df_print: kable
    reference_docx: mystyles.docx
...
---
```

Rendering MS Word documents

```
rmarkdown::render(input = "my-report.Rmd", output_format = "word_document")
```

if your document header *does not* have parameters for `word_document`, or

```
rmarkdown::render(input = "my-report.Rmd")
```

if your document header has the parameters and `word_document` is first in the list.

PDF documents

See http://rmarkdown.rstudio.com/pdf_document_format.html

- Put in 1st position in header, then `rmarkdown::render(input = "my-report.Rmd")`
- Or, `rmarkdown::render(input = "my-report.Rmd", output_format = "pdf_document")`
- Must install LaTeX for this to work

```
---
...
pdf_document:
```

```
toc: true
toc_depth: 2
...
---
```

Some useful parameters for the `rmarkdown::render()` command

- `output_file = myslides.ioslides.html` or `output_file = myslides.slidy.html` to specify different output file targets.
- `output_dir = reports` or `output_dir = docx` to direct output to a specific directory.
- `params = list(name = "Joe", quest = "Find the grail", favorite.color = "blue")` to pass parameters that R can use via `params$name`

How I used this

https://github.com/gilmore-lab/gilmore-thomas-fesi-2015/blob/master/render_all.R

<https://raw.githubusercontent.com/gilmore-lab/gilmore-thomas-fesi-2015/master/gilmore-thomas-fesi.Rmd>