# 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-hashes

```
## 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

```
<img src="fig.jpg">
```
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

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```
---
...
  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