

# R Markdown

The Johns Hopkins Data Science Lab

# Introduction

R Markdown is built into RStudio and allows you to create documents like HTML, PDF, and Word documents from R. With R Markdown, you can embed R code into your documents.

## Why use R Markdown?

- ▶ Turn work in R into more accessible formats
- ▶ Incorporate R code and R plots into documents
- ▶ R Markdown documents are reproducible – the source code gets rerun every time a document is generated, so if data change or source code changes, the output in the document will change with it.

# Getting Started

- ▶ Create a new R Markdown file in RStudio by going to File > New File > R Markdown...
- ▶ Click the “presentation” tab
- ▶ Enter a title, author, and select what kind of slideshow you ultimately want (this can all be changed later)

# Getting Started

The beginning of an R Markdown file looks like this: ---

```
title: "Air Quality"
```

```
author: "JHU"
```

```
date: "May 17, 2016"
```

```
output: html_document
```

--- The new document you've created will contain example text and code below this – delete it for a fresh start.

# Making Your First Slide

- ▶ Title your first slide using two # signs: ## Insert Title Here
- ▶ To make a slide without a title, use three asterisks: \*\*\*
- ▶ You can add subheadings with more # signs: ### Subheading or #### Smaller Subheading
- ▶ To add a new slide, just add another Title: ## New Slide Title

# Adding Text

- ▶ Add bullet points to a slide using a hyphen followed by a space:  
- bullet point
- ▶ Add sub-points using four spaces and a plus sign:      +  
sub-point
- ▶ Add an ordered list by typing the number/letter: 1. first  
point      a) sub-sub-point
- ▶ Add bullet points that appear one by one (on click) with: >-  
iterated bullet point

# Formatting Text

Text	Code in R Markdown
plain text	plain text
<i>italics</i>	<i>*italics*</i>
<b>bold</b>	<b>**bold**</b>
link	[link] ( <a href="http://www.jhsph.edu">http://www.jhsph.edu</a> )
verbatim code	<code>'code here '</code>

# Embedding R Code

This is a chunk of R code in R Markdown: ““{r}  
head(airquality) ““

The code gets run, and both the input and output are displayed.

```
head(airquality)
```

##	Ozone	Solar.R	Wind	Temp	Month	Day
## 1	41	190	7.4	67	5	1
## 2	36	118	8.0	72	5	2
## 3	12	149	12.6	74	5	3
## 4	18	313	11.5	62	5	4
## 5	NA	NA	14.3	56	5	5
## 6	28	NA	14.9	66	5	6



## Embedding R Code

To hide the input code, use `echo=FALSE`. ““{r, echo=FALSE}  
`head(airquality)` ““

##	Ozone	Solar.R	Wind	Temp	Month	Day
## 1	41	190	7.4	67	5	1
## 2	36	118	8.0	72	5	2
## 3	12	149	12.6	74	5	3
## 4	18	313	11.5	62	5	4
## 5	NA	NA	14.3	56	5	5
## 6	28	NA	14.9	66	5	6

This can be useful for showing plots.

# Embedding R Code

To show the input code only, use `eval=FALSE`. ““{r, eval=FALSE}  
head(airquality) ““

```
head(airquality)
```

# Embedding R Code

To run the code without showing input or output, use  
`include=FALSE`. ““{r, include=FALSE} library(ggplot2) ““

# Generating Slideshows

- ▶ Click the **Knit** button at the top of the R Markdown document to generate your new document.
  - ▶ You may be asked to install required packages if you don't already have them installed – hit “Yes” and RStudio will install them for you
- ▶ You can change the type of document generated by changing the output line in the header, or by selecting an output from the **Knit** button's pull-down menu.

# Generating Slideshows

- ▶ HTML: two options with different looks
  - ▶ `output: ioslides_presentation`
  - ▶ `output: slidy_presentation`
- ▶ PDF: `output: beamer_presentation`
- ▶ Note: You can specify multiple outputs at the beginning of the R Markdown file if you will need to generate multiple filetypes.

# PDFs and LaTeX

- ▶ To **knit** a PDF slideshow, you will need to install **LaTeX** on your computer
- ▶ LaTeX is a typesetting system that is needed to convert R Markdown into formatted text for PDFs

## Downloading and Installing LaTeX

- ▶ *LaTeX* is free
- ▶ LaTeX takes up a lot of space (almost ~2.6 GB download and takes up ~5 GB when installed)
- ▶ Visit <https://www.tug.org/begin.html> to download LaTeX for your operating system
- ▶ Depending on your internet connection, it may take a while to download due to its size

# Conclusion

For more information about R Markdown visit  
<http://rmarkdown.rstudio.com/>