Introduction to R Markdown

XDASI 2021

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What is it?

This is an R Markdown presentation.

Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents.

For more details on using R Markdown consult the R Markdown page on the course website.

Overview

R markdown is a convenient way to present your R scripts that allows you to:

- Embed R code
- Run R code chunks
- Display R graphics output
- Annotate and explain your code
- Display mathematical equations (LaTeX)

You will be handing in all of your homework as .Rmd documents.

How to do it

From within RStudio, you need to do four things:

1. Create an .Rmd document
2. Write some text
3. Write some code
4. Render the document

Step 1: Create an .Rmd document

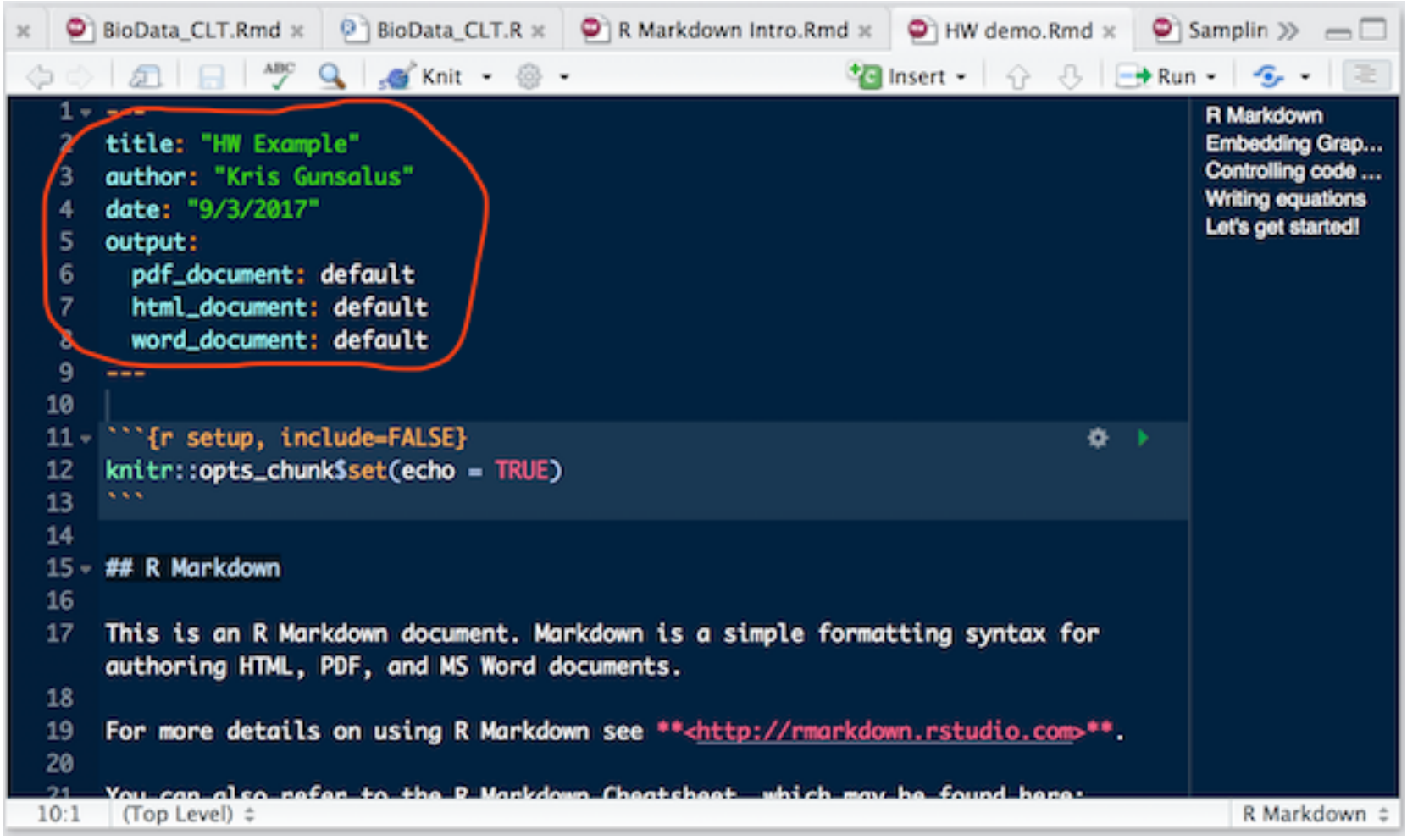
In the RStudio menu, select **File => New File => R Markdown**

...

- Give your document a title.
- Add your name.
- Add the date.
- Select **HTML** or **PDF** (you can change this later).

YAML header

- "YAML ain't markup!"
- Encodes some metadata about the document



Step 2: Add some text

- Use R Markdown tags to format the document (it's simple!)
- Headers, paragraphs, lists, etc. each use special symbols
- Use escape char \ for special symbols like Greek letters
- Use $ and $$ for LaTeX-formatted equations

```
## Writing equations

The above is a *density plot* for the **Standard Normal Distribution**:

$$f(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}$$
```

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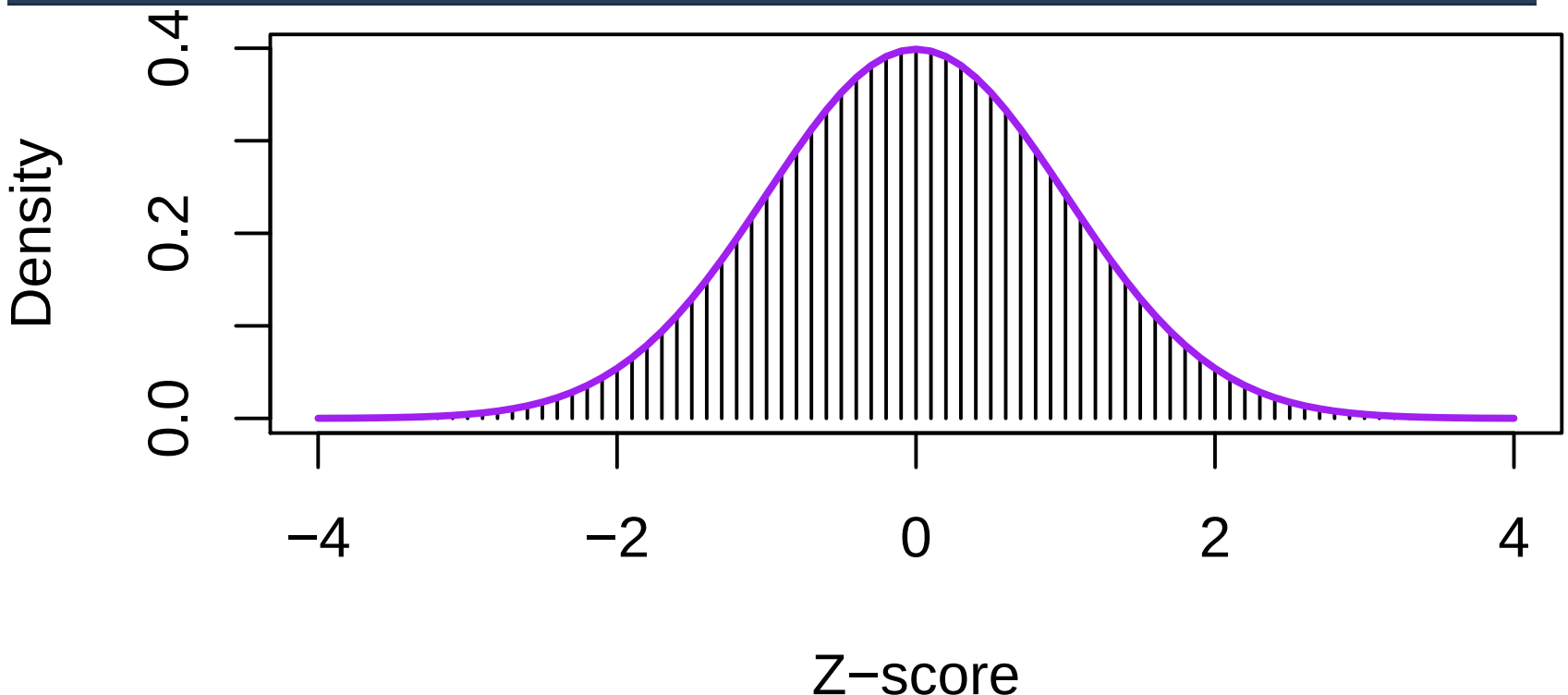
Step 3: Embedded chunks of R code

- Insert blocks of code using
  - the RStudio menu: Insert => R
  - keyboard shorcut: Command+Option+i (Mac) or Control+Option+i (PC)
- Code blocks are enclosed by “‘{r} and **“**
- Comments start with #

Including graphics

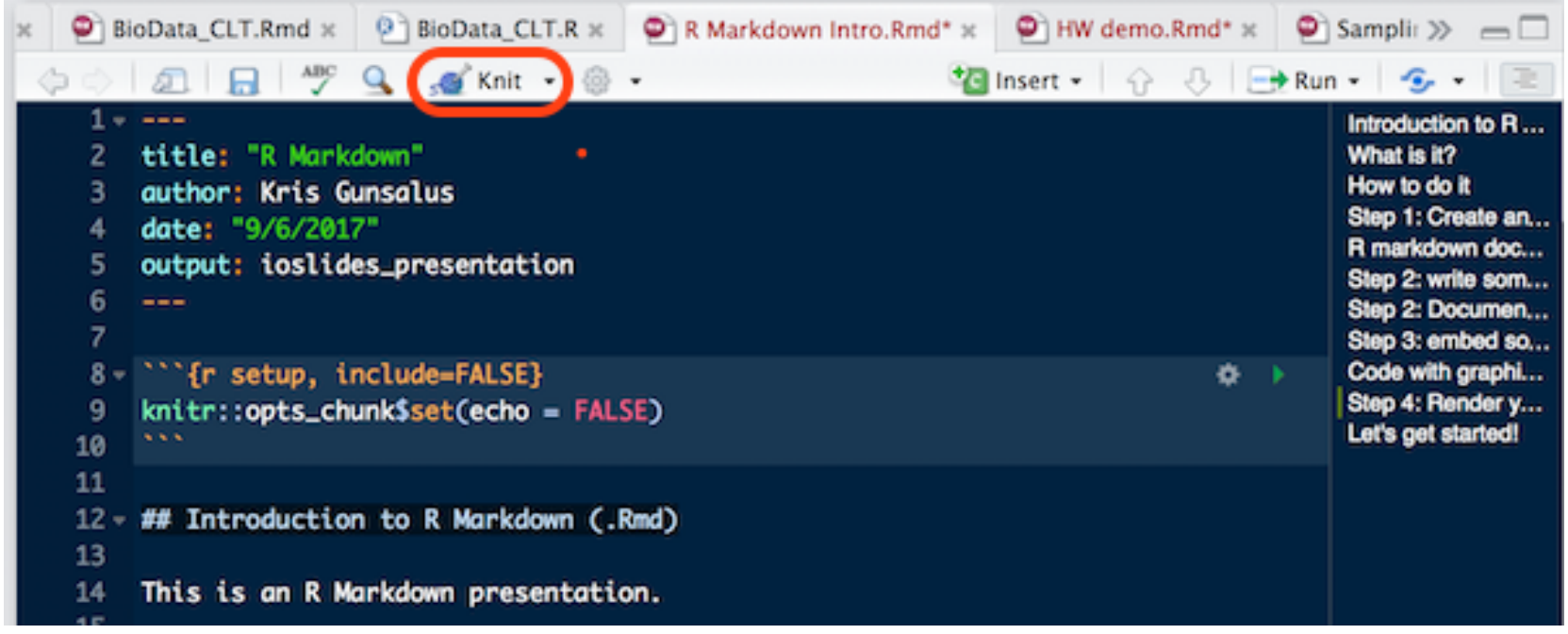
- echo=FALSE to hide the code; eval=FALSE‘ to hide execution result (TRUE by default)
- Can specify size

```
```{r normal_plot, echo=TRUE, eval=TRUE, fig.width=4, fig.height=3,
fig.align="left" }
x<-seq(-4,4,0.1)
y <- dnorm(x)
plot(x,y,type="h", xlab="Z-score", ylab="Density")
lines(x,y,col="purple", lwd=2)
```
```



Step 4: Render your document

- Click the **Knit** button to generate a document that includes both content as well as the output of any embedded R code chunks within the document.
- Knit your document to **HTML** or **PDF**, **Word**, or a variety of other formats (e.g. slide presentations).



Let's get started!

Exercise

- Open the R project you just created
- Start an R Markdown document
  - You will see some placeholders
  - Replace these with some of your own text and code
- Knit your .Rmd file to html or pdf
  - Note that it will automatically be saved when you knit it