

Instructor: Nara Yoon, Ph.D. (yoonnx@jmu.edu)

Spring 2024 | Thursdays 4-7pm, Hart 3008

Data Analytics for Managerial Leadership

WK 1: Introduction

PLAN FOR TODAY

Introduction to data-driven research

- R: what and why
- RStudio cloud
- Rmarkdown

CASE IN THE NEWS

De Langhe, B., and Oybtiun S. (Dec 7, 2020). Leading with decision-driven data analytics. MIT Sloan Management Review.

Goeva, A., Stoudt, S., and Trisovic, A. (Dec 16, 2020). Toward reproducible and extensible research: From values to action. Harvard Data Science Review.

READINGS

Matloff, N. (2011).

- Ch 1. Getting started (1.1 through 1.3)

Long & Teeter (2019).

- Ch 1. Getting started and getting help
- Ch 2. Some basics
- Ch 16. R markdown and publishing

Baumer, B., Kaplan, D., & Horton, N.

- What is data science? (Ch 1.1)

R

REPRODUCIBLE RESEARCH: WHY DO WE CARE ABOUT R?

Scripting using R

Programming using *R Markdown*

Adopting research process that
can be *verified* and *tracked*



R MARKDOWN



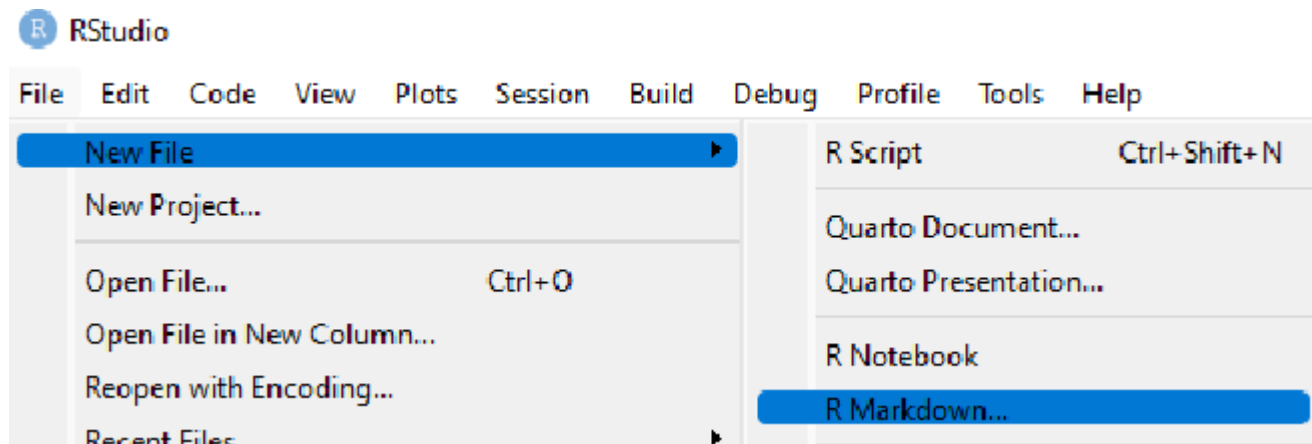
<https://vimeo.com/178485416>

Step 1: Install & create R markdown

INSTALL PACKAGES

```
install.packages( "rmarkdown" )  
install.packages( "knitr" )
```

CREATE A MARKDOWN DOCUMENT



PUT TITLE & AUTHOR & DATE

New R Markdown

 Document

 Presentation

 Shiny

 From Template

Title:

Author:

Date:

☐ Use current date when rendering document

Default Output Format:

☒ HTML
Recommended format for authoring (you can switch to PDF or Word output anytime).

☐ PDF
PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).

☐ Word
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

Create Empty Document

OK Cancel

Step 2: Working with a chunk

WHAT IS A CHUNK?

A chunk is surrounded by three back ticks ``

It looks like this:

```
```{r}  
Code goes here
```
```

HOW TO ADD A CHUNK?

Two ways to do it

1. Press “Control + alt + I” (on windows)
2. Click “Insert” button at the top of editor window

CHUNK OPTIONS

```
```${r name-of-this-chunk, warning=FALSE, message=FALSE}  
Code goes here
```
```

- 1. `include = FALSE` : prevents code and results from appearing in the finished file
R Markdown still runs the code in the chunk, and the results can be used by other chunks
- 2. `echo = FALSE` : prevents code, but not the results from appearing in the finished file
This is a useful way to embed figures
- 3. `message = FALSE` : prevents messages that are generated by code from appearing in the finished file
- 4. `warning = FALSE` : prevents warnings that are generated by code from appearing in the finished file

Step 3. Formatting a document

FORMATTING WITH POUND SYMBOL (#)

There are 6 options

(first level header)

(second level header)

###

####

#####

#####

Header 1

Header 2

Header 3

Header 4

Header 5

Header 6



Header 1

Header 2

Header 3

Header 4

Header 5

Header 6

If you type in syntax
like this



Your output will look
like this

```
Plain text
End a line with two spaces to start a new paragraph.
*italics* and _italics_
**bold** and __bold__
superscript^2^
~~strikethrough~~
[link](www.rstudio.com)
```

```
# Header 1
```

```
## Header 2
```

```
### Header 3
```

```
#### Header 4
```

```
##### Header 5
```

```
##### Header 6
```

```
Plain text
End a line with two spaces to start a new paragraph.
italics and italics
bold and bold
superscript2
strikethrough
link
```

Header 1

Header 2

Header 3

Header 4

Header 5

Header 6

Step 4: Knitting your document

KNIT TO CONVERT OUTPUT INTO HTML

There are two options

1. Click “Knit” button at the top of editor window
2. Press “Control + shift + K” (on windows)

