

Intro to R Markdown

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 @_R_Lai_ and @eolasinntinn

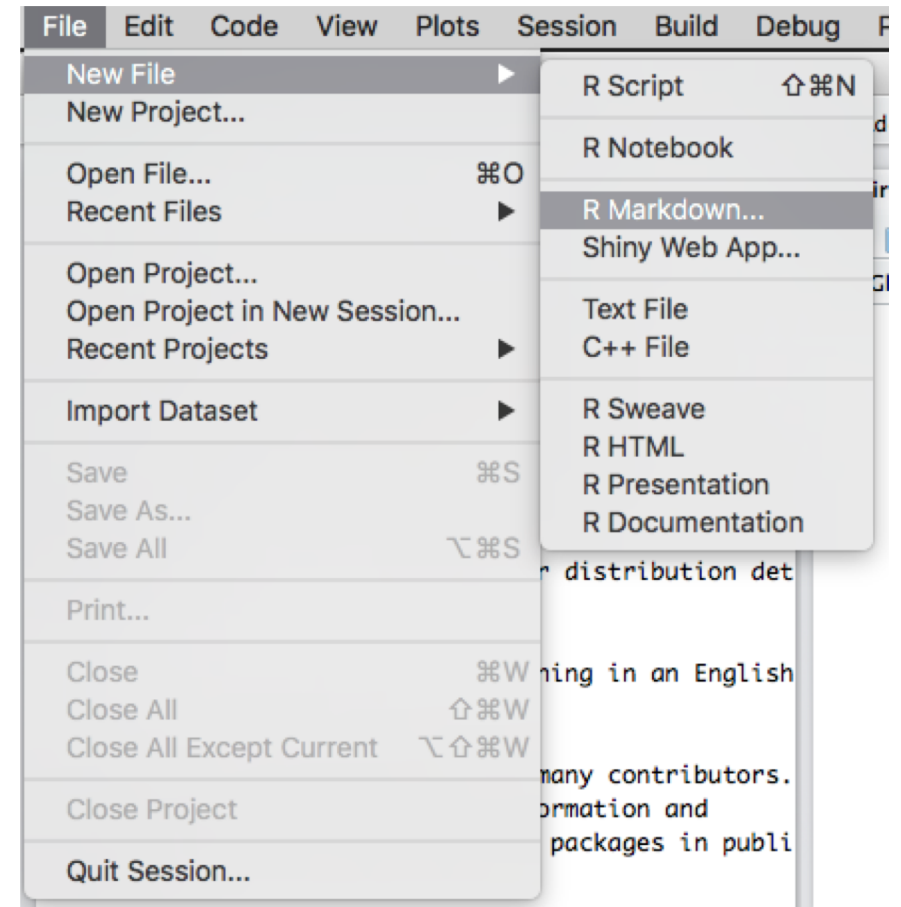
Aims of this Session

1. Explain what R Markdown
2. Why R Markdown might be useful
3. Learn some basic R Markdown Formatting
4. Group coding in an R Markdown document
5. “Knitting” a document



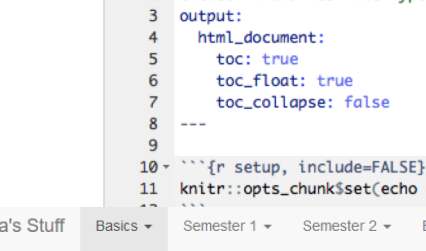
What is an R Markdown File?

- Another type of file that can be read by R
- Just like an .r script, it is a type of text file
 - The extension .Rmd tells R to read it in a very specific way
- Aimed at producing documents for humans, not computers
 - .r scripts default text = code for *computers* to read
 - .Rmd files default text = text for *humans* to read



Why are these useful?

- Create attractive and high quality documents
 - HTML, PDF and Word document outputs
(PDF requires LaTeX installation, Word needs Word)
- Do this directly from analyses scripts
 - Integration of results into the final product
 - No copying and pasting graphs from Excel, SPSS or whatever into word documents



```

1 |---
2 |title: "R and its File Types"
3 |output:
4 |  html_document:
5 |    toc: true
6 |    toc_float: true
7 |    toc_collapse: false
8 |---
9 |
10| {r setup, include=FALSE}
11| knitr::opts_chunk$set(echo = TRUE)

```

Rebecca's Stuff Basics Semester 1 Semester 2 Extras Tasks Fees

R and its File Types

What are R and RStudio IDE?

R

RStudio IDE

- Console
- Environment/History/Connections
- Files/Plots/Packages/Help/Viewer

File Types

- .r Files
- Comments
- .Rmd files
- Code Chunks
- Saving your file

mander Logo" align="right"

ich widely used for data c

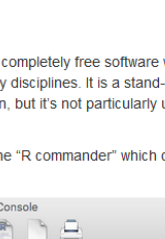
e seen below:

er>

50" alt="R Commander Logo"

nvironment) is essentially

When you open R alone you get the "R commander" which can be seen below:



R version 3.3.3 (2017-03-06) -- "Another Canoe"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin13.4.0 (64-bit)

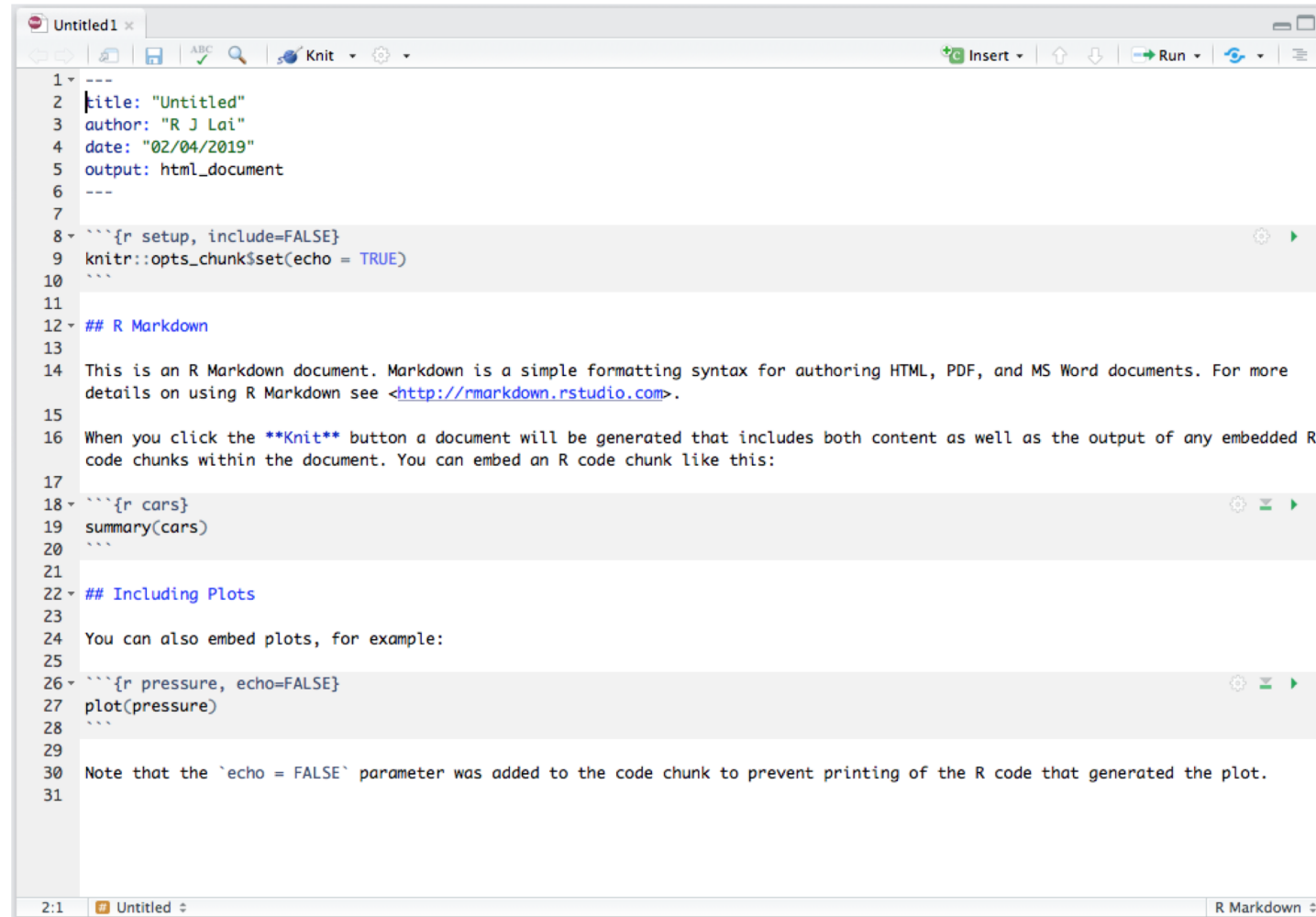
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.

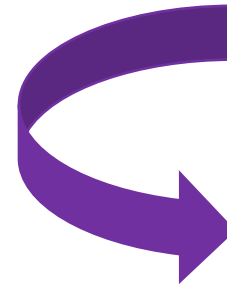
R Markdown Basics: The Default File

A screenshot of an R Markdown document in a text editor. The document is titled "Untitled1" and contains a series of lines of code and text. The code includes a YAML header with fields for title, author, date, and output. It also contains two R code chunks: one for setting up the environment and another for running the summary function on the 'cars' dataset. The text explains the purpose of the document and how to use the Knit button. The editor interface shows a toolbar with icons for saving, running, and other functions. The status bar at the bottom indicates the current line and column (2:1) and the document type (R Markdown).

```
1 ---
2 title: "Untitled"
3 author: "R J Lai"
4 date: "02/04/2019"
5 output: html_document
6 ---
7
8 ```{r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10 ```
11
12 ## R Markdown
13
14 This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more
15 details on using R Markdown see <http://rmarkdown.rstudio.com>.
16
17 When you click the Knit button a document will be generated that includes both content as well as the output of any embedded R
18 code chunks within the document. You can embed an R code chunk like this:
19
20 ```{r cars}
21 summary(cars)
22 ```
23
24 ## Including Plots
25
26 You can also embed plots, for example:
27
28 ```{r pressure, echo=FALSE}
29 plot(pressure)
30 ```
31
32 Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.
```

R Markdown Basics: YAML

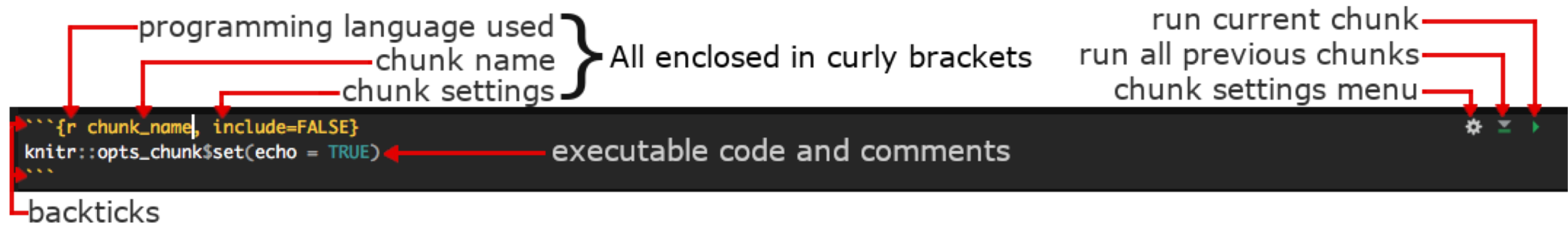
- Document metadata
- Defaults given:
 - Title of the document
 - Author of the document
 - Date: system date at time of creation
 - Output: HTML
- Can make additions to this:
 - Bibliographies- .bib files
 - Finicky! Indentation must be precise!
 - When you set the HTML options and knit to a different type it will be automatically changed.



```
1 ---
2 title: "Untitled"
3 author: "R J Lai"
4 date: "02/04/2019"
5 output:
6   html_document:
7     toc: yes
8     toc_depth: 4
9     toc_float:
10       collapsed: no
11
12 ---
```

```
1 ---
2 title: "Untitled"
3 author: "R J Lai"
4 date: "02/04/2019"
5 output:
6   word_document:
7     toc: yes
8     toc_depth: '4'
9   html_document:
10     toc: yes
11     toc_depth: 4
12     toc_float:
13       collapsed: no
14 |---
```

R Markdown Basics: Code Chunks



R Markdown Basics: Chunk Settings

include = TRUE/FALSE

- Include code and results in the final output or not. Code is run and outputs created, but is displayed or hidden according to TRUE or FALSE status.

echo = TRUE/FALSE

- Display the code in the final output or not. Results, such as graphs, not affected.

message = TRUE/FALSE

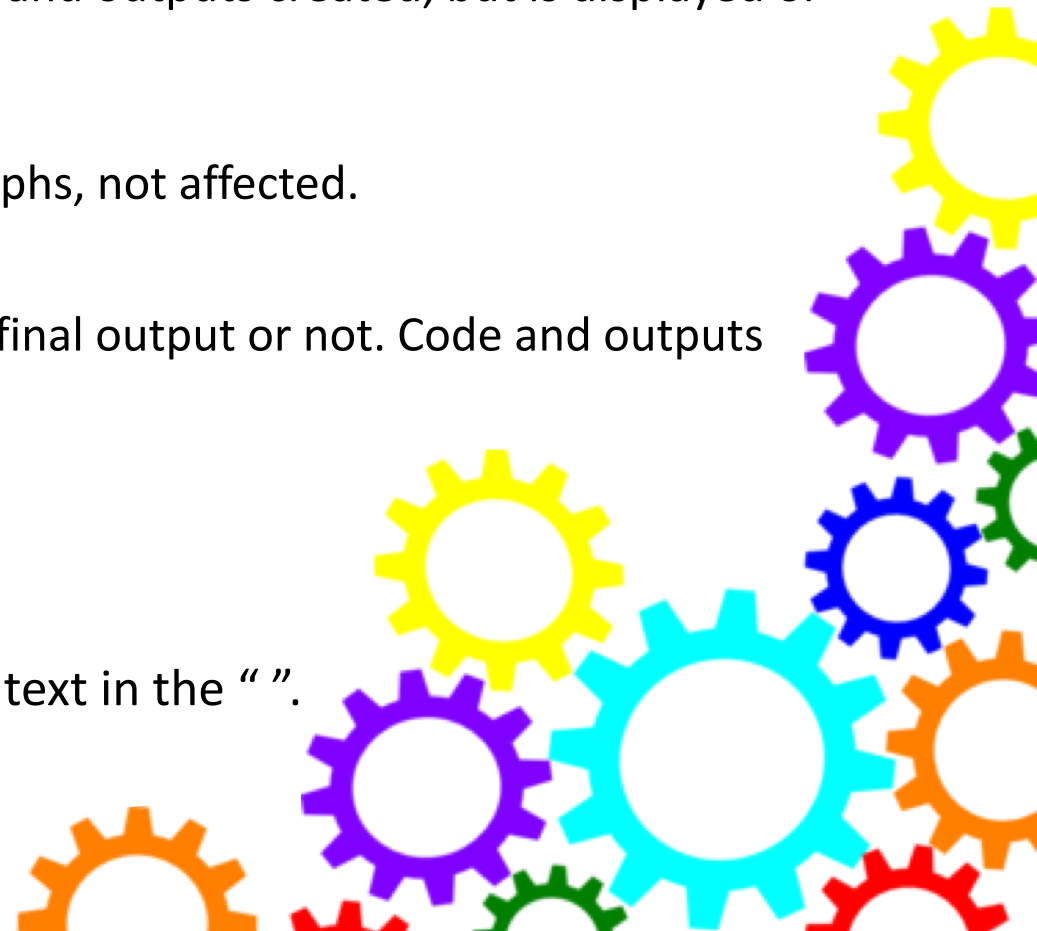
- Display output messages (such as package loading info) in the final output or not. Code and outputs not affected.

warning = TRUE/FALSE

- Display warning messages in the final output or not.

fig.cap = “...”

- Attach a figure caption to graphical results. Put the caption text in the “ ”.



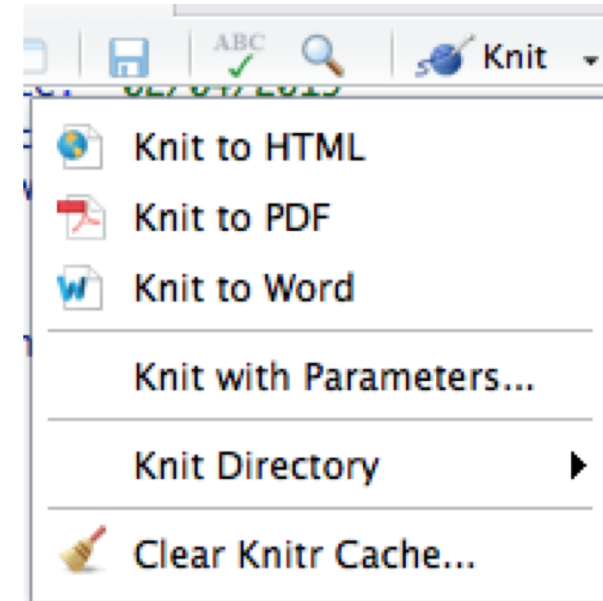
R Markdown Basics: Text Formatting

- Headings:
 - Uses Hashtags- # Heading 1, ## Heading 2, etc.
 - Headings used in table of contents
- Bold: surround by ****double asterisk**** or **__double underscores__**
- Italics: surround by **single asterisk** or *_single underscore_*
- Inline code:
 - Can include executable code in the text sections, useful for outputting numbers generated from code

```
26 `r cars`  
27 summary(cars)  
28 `r`  
29  
30 `r round(mean(cars$speed), 1)`
```

R Markdown Basics: “Knitting”

- Knitting a document creates a specific type of output from the .Rmd file:
 - Default is HTML
 - Word (requires Microsoft Word)
 - PDF (requires LaTeX installation)





Now for some tasks using the packages we've been learning about this morning!

Extras: Bibliographies

```
metal.bib - Notepad
File Edit Format View Help
@online{metaldata,
  author = {MrPantherson},
  title = {{Metal Bands By Nation}},
  year = 2017,
  url = {https://www.kaggle.com/mrpantherson/metal-by-nation},
  urldate = {2019-03-24}
}
```



```
1 |--
2 title: "Top 10 Metal Genres"
3 author: "Rebecca J Lai"
4 date: "26 March 2019"
5 output: html_document
6 bibliography: metal.bib
7 csl: apa-5th-edition.csl
8 ---
```



```
16 These are the top ten
    metal styles of all time,
    according to anaylsis of
    data provided by
    @metaldata.
17
```



```
b2
63 # References
64
```



These are the top ten metal styles of all time, according to analysis of data provided by MrPantherson (2017).



References

MrPantherson. (2017). Metal Bands By Nation. Retrieved March 24, 2019, from <https://www.kaggle.com/mrpantherson/metal-by-nation>

- Produce full reports directly from analysis files.
- Bibtex files and code in text to insert citations.
- Different citation styles available (see <https://github.com/citation-style-language/styles>)

For more info see https://rmarkdown.rstudio.com/authoring_bibliographies_and_citations.html

Extras: HTML code

- R Markdown files also accept HTML code
 - Include links, images and twitter feeds (see <https://publish.twitter.com/>)

```
14 
```



```
59 <a class="twitter-timeline"
href="https://twitter.com/_R_Lai_?ref_src=tw
src%5Etfw">Tweets by _R_Lai_</a> <script
async src="https://platform.twitter.com/widg
ets.js" charset="utf-8"></script>
```

Tweets by @_R_Lai_

Rebecca Lai Retweeted



Ben Jones
@Ben_C_J

Replying to @Ben_C_J

It's bad enough if they want to contribute to the publication bias that damages the field, but explicitly encouraging authors to present exploratory analyses as confirmatory? That's just unforgivable.



Mar 31, 2019

Rebecca Lai Retweeted