



R, RStudio, R Markdown

INTRODUCTION

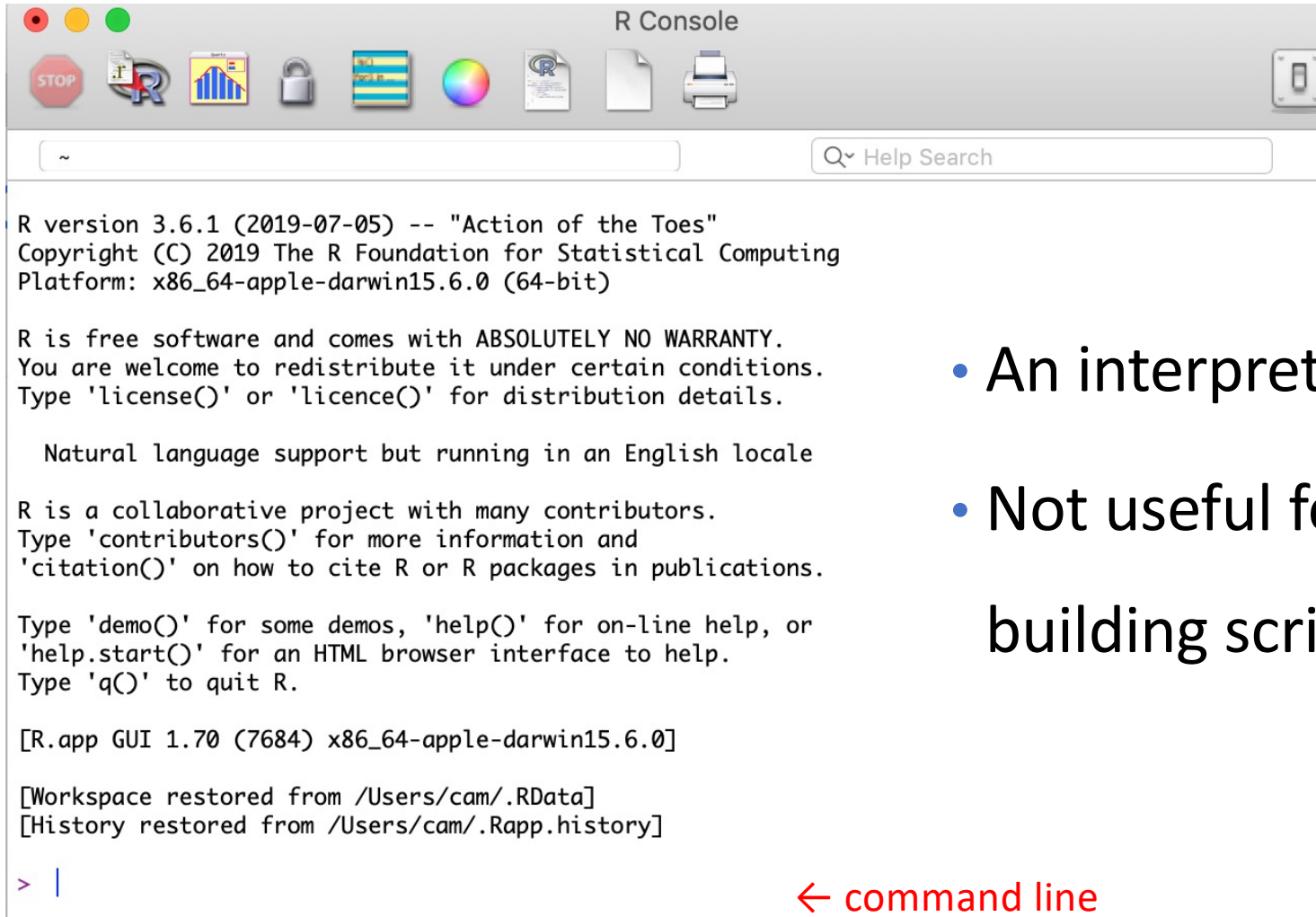
R is a programming language for statistical computing and graphical display

It is the most suitable resource for Statistical learning

When installing R we get

- R Console
- R interpreter

INTRODUCTION



```
R version 3.6.1 (2019-07-05) -- "Action of the Toes"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin15.6.0 (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.
Type 'q()' to quit R.

[R.app GUI 1.70 (7684) x86_64-apple-darwin15.6.0]

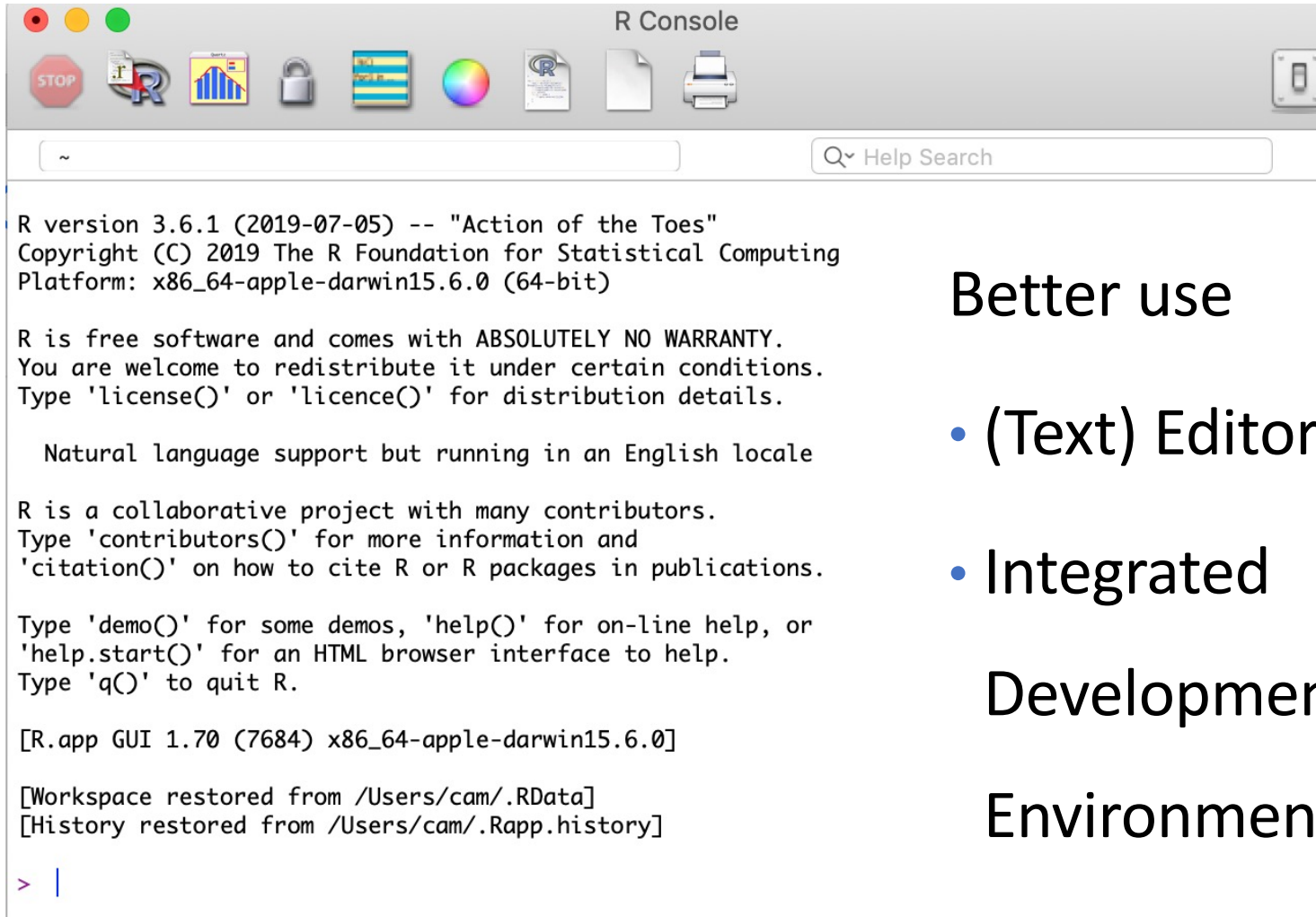
[Workspace restored from /Users/cam/.RData]
[History restored from /Users/cam/.Rapp.history]

> |
```

- An interpreter for R
- Not useful for building scripts

← command line

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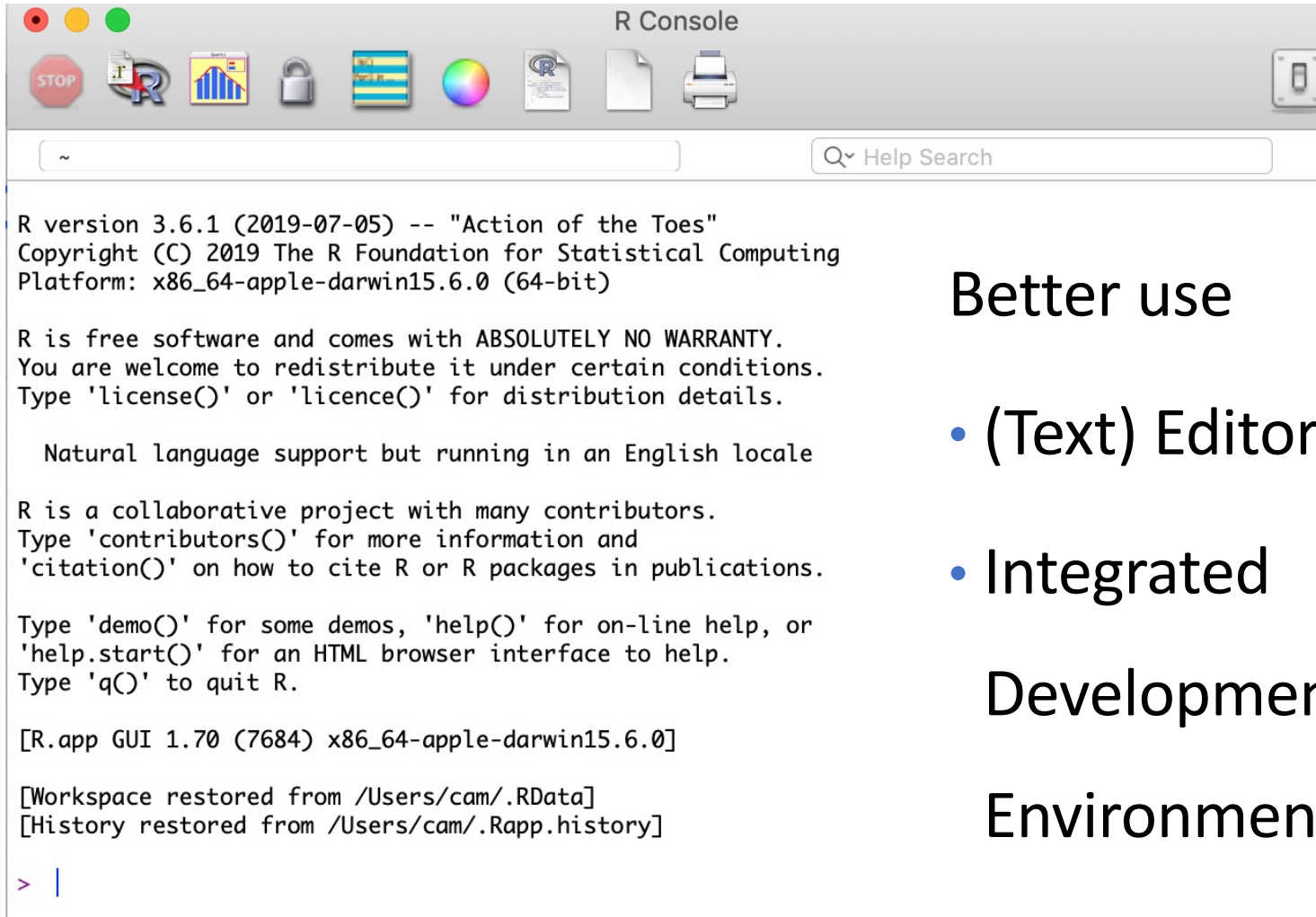
Better use

- (Text) Editor
- Integrated

Development

Environment (IDE)

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Better use

- (Text) Editor
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Development

Environment (IDE)

INTRODUCTION

- **RStudio** is an IDE (Integrated Development Environment)
- It includes a text editor, interpreter, graphical display window, and additional features
- Launching RStudio launches R as well

INSTALLING RSTUDIO

- <https://posit.co/downloads/>
- Select your OS version

OS	Download
Windows 10/11	RSTUDIO-2022.12.0-353.EXE ↓
macOS 10.15+	RSTUDIO-2022.12.0-353.DMG ↓

R MARKDOWN

- A file format (.Rmd) to create dynamic documents from R
- markdown is a format to write plain text with enhanced output
- R Markdown combines markdown with the user's R code
- The .Rmd file contains the code, its output, and text in markdown format
- You write a script (code), insert text, and run (knit) it, to get a report that includes it all
- The format of the final report may be html (for web publishing), pdf, MS Word, or other

- `install.packages("...")`

To open (and use) an installed library

- `library("...")`

To remove (from hard disk) an installed library

- `remove.packages("...")`

rmarkdown

A library to create dynamic documents

What is a **dynamic document**?

A document that includes text, scripts, output

Installing library rmarkdown

- For Windows

<https://intro2r.com/ms-windows.html>

- For Mac OS

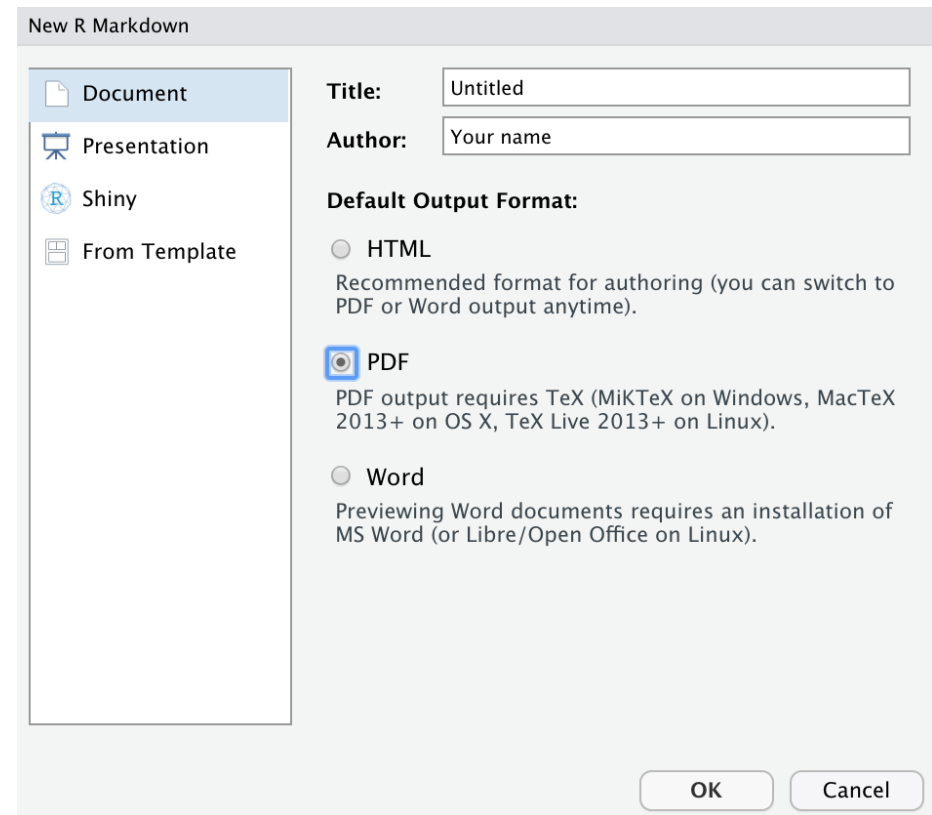
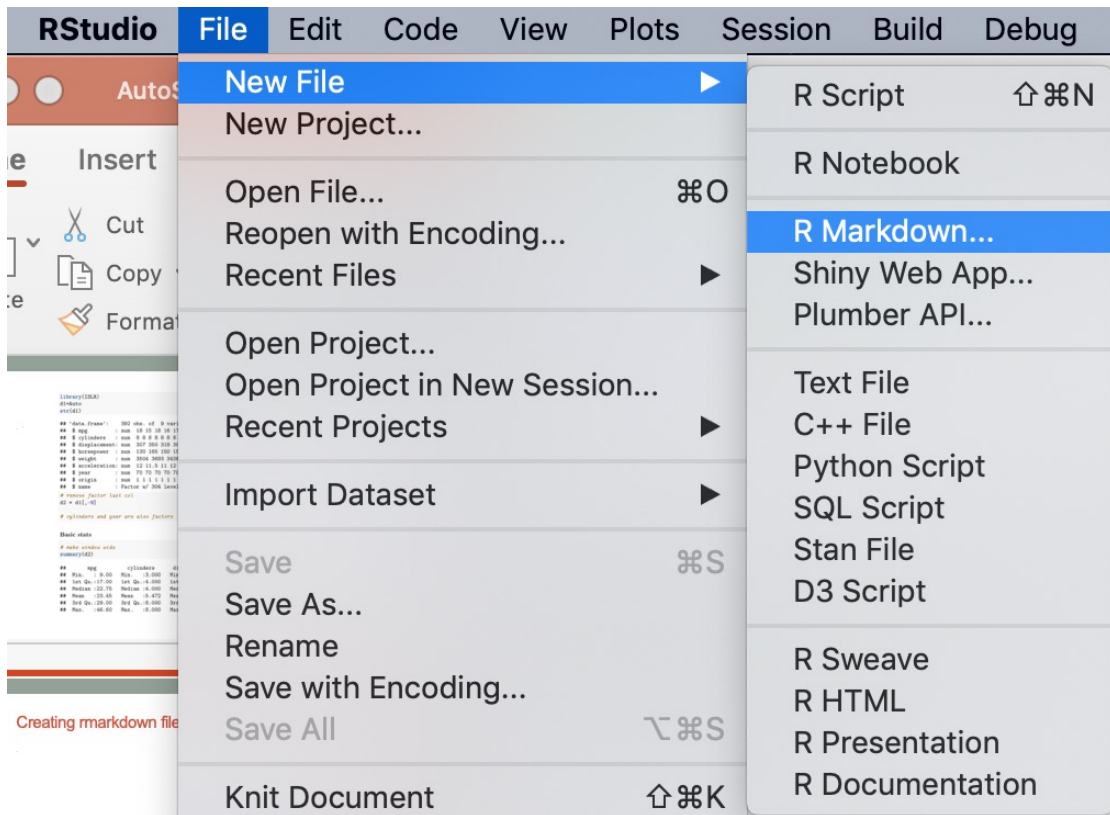
```
install.packages('rmarkdown', dep = TRUE)
```

dep = TRUE argument will install additional R packages on which rmarkdown depends

rmarkdown

- RStudio comes with rmarkdown and LaTeX (for Mac).
- PC users may need to install them
- Most LaTeX commands can be used in .Rmd
- RStudio can be used as compiler of LaTeX scripts

Creating markdown file



Creating markdown file

New R Markdown

Document

Presentation

Shiny

From Template

Title:

HW1

Author:

Cesar Acosta, USC ID 999-99-999

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).

RStudio

Go to file/function

Addins

Insert

Run

Untitled1

```
1 ---
2 title: "HW1"
3 author: "Cesar Acosta, USC ID 999-99-999"
4 date: "1/8/2023"
5 output: pdf_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,
15 and MS Word documents. For more 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
18 as the output of any embedded R code chunks within the document. You can embed an R code chunk
19 like this:
20
21 ```{r cars}
22 summary(cars)
23 ```
24
25 ## Including Plots
26
27 You can also embed plots, for example:
28
29 ```{r pressure, echo=FALSE}
30 plot(pressure)
31 ```
32
33 Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R
34 code that generated the plot.
```

Creating markdown file

```
hw2.Rmd x
1 ---
2 title: "HW2"
3 author: "Cesar Acosta, USC ID 999-99-999"
4 date: "1/8/2023"
5 output: pdf_document
6 ---
7 |
8 ## R Markdown
9
10 When you click the Knit button a document will be generated that includes
both content as well as the output of any embedded R code chunks within the
document. You can embed an R code chunk like this:
11
12 ```{r chunk1}
13 summary(cars)
14 ```
15
16 ## Including Plots
17
18 ```{r chunk2}
19 # You can also embed plots into the Rmd document, for example
20 plot(pressure,type="l")
21 grid()
22 ```
23
24 Note that the `echo = FALSE` parameter was added to the code chunk to prevent
printing of the R code that generated the plot.
```

HW2

Cesar Acosta, USC ID 999-99-999

1/8/2023

R Markdown

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

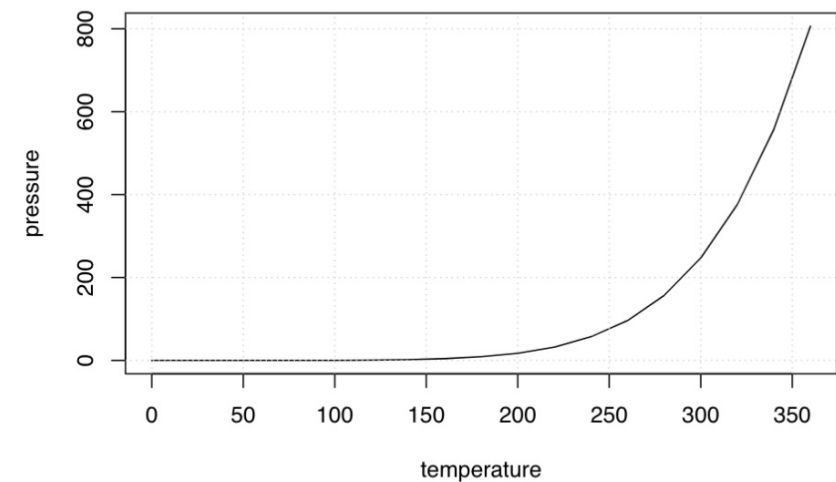
```
summary(cars)
```

```
##      speed      dist
## Min.   : 4.0    Min.   :  2.00
## 1st Qu.:12.0    1st Qu.: 26.00
## Median :15.0    Median : 36.00
## Mean   :15.4    Mean   : 42.98
## 3rd Qu.:19.0    3rd Qu.: 56.00
## Max.   :25.0    Max.   :120.00
```

Including Plots

You can also embed plots into the Rmd document, for example

```
plot(pressure,type="l")
grid()
```



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Creating markdown file

- File > New File > R Markdown
- Save file (will be created as .Rmd)
- Add R code and text portions into the .Rmd file
- Knit the file (generating pdf file)

reference: https://rmarkdown.rstudio.com/articles_intro.html