

Reporting and Documentation

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Through out this course we will conduct various analysis in R and report on the results. Reporting is important because it achieves two things:

- Reproducibility of Results
- Communication of Results

For this purpose we will mainly use R Markdown documents. This learning activity mainly focuses on creating reports with R Markdown, but also points to other formats useful in analysis and reporting.

Reporting with R Markdown

An adaptation of markdown format to R, the Rmd file format allows for presentable reporting of R analysis. All documents you encounter in relation to this class have been generated with R markdown. If you are preparing a report to be presented, Rmd is the format you should aim for.

You may already have noticed that each learning activity comes with a bunch of files (pdf, html, video, and Rmd). Rmd files are the source files through which all other files are generated from. You can inspect them to see how to generate a report with R. I will be expecting all homework assignments related to this course to be submitted in the same format as well.

Here are the most commonly used syntax elements.

Headers:

```
# A Hash Sign Signifies a Header
## The More Hashes Mean Lower Level Headers
### The More Hashes Mean Lower Level Headers
```

Font Effects

If you want code to be *italic*, **bold**, or ***bold italic*** use asterixes (*) to surrount the words

R Code:

If you embed R code between ````${r}```` and `````, the code will be executed and results rendered on resulting document. The area between the ````${r}```` and ````` is called a chunk. Note the difference in rendering of chunk symbols between the rendered and raw versions. R will treat the backticks as code, hence the difference.

```
```${r}``
ls()
```
```

The code shown above, when rendered looks like this:

Headers:

A Hash Sign Signifies a Header

The More Hashes Mean Lower Level Headers

The More Hashes Mean Lower Level Headers

Font Effects

If you want code to be *italic*, **bold**, or ***bold italic*** use asterixes (*) to surround the words you want emphasized. Single asterix on each side will produce italic, double asterixes will create bold, and triple asterixes will produce . . . you got it, bold italic text.

R Code:


If you embed R code between {r} and, the code will be executed and results rendered on resulting document. The area between the {r} and is called a chunk. Note the difference in rendering of chunk symbols between the rendered and raw versions. R will treat the backticks as code, hence the difference.


```
ls()  
  
## character(0)
```

A Word About R Markdown

The way R studio processes R Markdown documents is to run them in an isolated R instance. That means R Markdown documents when rendered through “knit” button won’t have access to data and packages in your current workspace. You need to load libraries, and data in each document you want to render using those. This is done to ensure reproducibility.

Executing and Rendering Code in R Markdown

If you want to run code in any chunk (that is an area defined by backticks) you can use the  button. To run line by line, select the line and press CTRL and Enter at the same time. Go ahead the click the little downwards arrow next to the button to see your other options.

Once you are done writing the document you can click the  button to create a pdf or html rendering of the markdown file.

Refer to ‘[R Markdown Cheat Sheet](#)’ for more information on this format.

R Scripts

R Scripts can be seen as the most basic form of reproducible analysis. If you have no concerns for presentation and just want to automate a process you can basically write your commands in a text file and change the extension to .R, thus achieving an R script file. You can then ask R to execute this file in the command line as seen below, thus repeating the process detailed in the script. This is good for automating work flows.

```
R CMD BATCH my_script.R
```

More Advanced Reporting Tools

If you want to create presentations rather than reports, you can use [Beamer](#).

For interactive documents with R, take a look at [Shiny](#).



How I Learned to Stop Worrying and Love the R Console by [Irfan E Kanat](#) is licensed under a [Creative Commons Attribution 4.0 International License](#). Based on a work at <http://github.com/iekanat/rworkshop>.