

Code Chunks in R Markdown

Next, we will talk about code chunks in R `markdown` files.

Learning Objectives

At the end of this activity, you will:

- Be able to add code to a code chunk in an `.Rmd` file
- Be able to add options to a code chunk in R Studio

What you need

You will need the most current version of R and, preferably, RStudio loaded on your computer to complete this tutorial.

Install R Packages

- **knitr:** `install.packages("knitr")`
- **rmarkdown:** `install.packages("rmarkdown")`

We have we have already learned that an `.Rmd` document contains three parts

1. A **YAML** header
2. Text chunks in markdown syntax that describe your processing workflow or are the text for your report.
3. Code chunks that process, visualize and/or analyze your data.

Let's break down code chunks in `.Rmd` files.

Data Tip: You can add code output or an R object name to markdown segments of an RMD. For more, view this R Markdown documentation. `{: .notice}`

Code chunks

Code chunks in an R Markdown document contain your R code. All code chunks start and end with “`“ – three backticks or graves. On your keyboard, the backticks can be found on the same key as the tilde (~). Graves are not the same as an apostrophe!`

A code chunk looks like this:

The first line: “`{r chunk-name-with-no-spaces}</code>` contains the language (r) in this case, and the name of the chunk. Specifying the language is mandatory. Next to the `{r}`‘, there is a chunk name. The chunk name is not necessarily required however, it is good practice to give each chunk a unique name to support more advanced knitting approaches.

Activity: Add Code Chunks to Your R Markdown File

Continue to add to the `.Rmd` document that you created in the previous lesson. Below the last section that you've just added, create a code chunk that performs some basic math.

Then, add another chunk. Give it a different name.

Now run the code in this chunk.

You can run code chunks:

- **Line-by-line:** with cursor on current line, Ctrl + Enter (Windows/Linux) or Command + Enter (Mac OS X).
- **By chunk:** You can run the entire chunk (or multiple chunks) by clicking on the **Chunks** dropdown button in the upper right corner of the script environment and choosing the appropriate option. Keyboard shortcuts are available for these options.

```
<a href="{ site.baseurl }/images/course-materials/earth-analytics/week-1/intro-knitr-rmd/rmd-run.png">
 The "run" button in RStudio allows you to run a chunk individually
```

or to run all chunks at once. RStudio Version 0.99.903.

Comment your code

Notice that in each of our code chunks, we've introduced **comments**. Comments are lines in our code that are not run by **R**. However they allow us to describe the intent of our code. Get in the habit of adding comments as you code. We will discuss this further when we break down scientific programming in **R** in a later tutorial.

Code chunk options

You can add options to each code chunk. These options allow you to customize how or if you want code to be processed or appear on the rendered output (pdf document, html document, etc). Code chunk options are added on the first line of a code chunk after the name, within the curly brackets.

The example below, is a code chunk that will not be “run”, or evaluated, by **R**. The code within the chunk will appear on the output document, however there will be no outputs from the code.

One example of using **eval=FALSE** is for a code chunk that exports a file such as a figure graphic or a text file. We may want to show / document the code that we used to export that graphic in our html or pdf document, but we don't need to actually export that file each time we create a revised html or pdf document.

3 common chunk options: eval, echo & results

Three common code chunk options are:

- **eval = FALSE:** Do not **evaluate** (or run) this code chunk when knitting the RMD document. The code in this chunk will still render in our knitted HTML output, however it will not be evaluated or run by **R**.
- **echo=FALSE:** Hide the code in the output. The code is evaluated when the RMD file is knit, however only the output is rendered on the output document.
- **results=hide:** The code chunk will be evaluated but the results or the code will not be rendered on the output document. This is useful if you are viewing the structure of a large object (e.g. outputs of a large **data.frame** which is the equivalent of a spreadsheet in **r**).

Multiple code chunk options can be used for the same chunk.

Activity: Add More Code to Your R Markdown

Add a new chunk with the following arguments. Then describe in your own words when you might want to use each of these arguments. **HINT:** Think about creating a report with plots where you have a lot of code generating those plots.

We will knit our R Markdown document to **.html** in the next lesson.

Additional Resources

- RStudio documentation.
- knitr documentation.