Write Reports and Document Workflow Using R Markdown

Getting Started

Let's dive deeper into the R Markdown file format. This tutorial will introduce you to working withR Markdown files in `R` and `R Studio`. We will create an R Markdown file and render it to html using the `knitr` package.

Learning Objectives

At the end of this activity, you will:

- Know how to create an R Markdown file in RStudio.
- Be able to write a script with text and R code chunks.
- Create an R Markdown document ready to be 'knit' into an HTML document to share your code and results.

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")`

Create a new R Markdown file in RStudio

Watch the 6:38 minute video below to see how we convert an R Markdown file to HTML (or other formats) using `knitr` in `RStudio`. **NOTE:** The text size in the video is small so you may want to watch the video in full screen mode.

Create Your .Rmd File

Now that you see how R Markdown can be used in RStudio, you are ready to create your own `.RMD` document. Do the following:

1. Using the Create a new R Markdown file and choose HTML as the desired output format.
2. Enter a Title (Earth Analytics Week 1) and Author Name (your name). Then click OK.
3. Save the file using the following format: **FirstInitial-LastName-week-1.Rmd** NOTE: The document title is not the same as the file name.
4. Hit the `Knit HTML` drop down button in `RStudio` (as is done in the video above). What happens?

LEFT: Create a new RMD file using the file drop down menu in R Studio. RIGHT: Location of the knit button in RStudio in Version 0.99.903.

If everything went well, you should have an HTML format (web page) output after you hit the knit button. Note that this HTML output is built from a combination of code and text documentation that was written using markdown syntax.

Don't worry if you don't know what markdown is. We will cover that in the next lesson.

Next, let's break down the structure of an R Markdown file.

The Structure of an R Markdown file

```
<a href="{{ site.baseurl }}/images/course-materials/earth-analytics/week-1/intro-knitr-rmd/NewRmd-html-
<img src="{{ site.baseurl }}/images/course-materials/earth-analytics/week-1/intro-knitr-rmd/NewRmd-html-
<figcaption>Screenshot of a new R Markdown document in RStudio. Checkout the three
```

types of information: 1. the YAML header at the very top 2:. Chunks of r code separated by "' and 3. Text written using markdown syntax.

Data Tip:** Screenshots on this page are from `RStudio` with appearance preferences set to `Twilight` with `Monaco` font. You can change the appearance of your RStudio by Tools** > **Options** (or **Global Options** depending on the operating system). For more, see the Customizing RStudio page. {: .notice}

There are three parts to an `.RMD` file:

- **Header:** the text at the top of the document, written in *YAML* format.
- **Markdown sections:** text that describes your workflow written using *markdown syntax.*
- **Code chunks:** Chunks of R code that can be run and also can be rendered using `knitr` to an output document.

Next, let's break down each of the parts listed above.

YAML Header (Front Matter)

An R Markdown file always starts with a header written using YAML syntax. This header is sometimes referred to as the `front matter`.

There are four default elements in the RStudio YAML header:

- **title:** the title of your document. Note, this is not the same as the file name.
- **author:** who wrote the document.
- **date:** by default this is the date that the file is created.
- **output:** what format will the output be in. We will use HTML.

Note that a YAML header begins and ends with three dashes `---`. Also notice that the value for each element, title, author, etc, is in quotes `"value-here"` next to the element. A YAML header may be structured differently depending upon how your are using it. Learn more on the R Markdown documentation page.

Example YAML header in an R Studio R Markdown file:

```
---
title: "title"
author: "Your Name"
date: "December 4, 2016"
output: html_document
---
```

R Markdown Text / Markdown Blocks

The second part of a R Markdown document is the markdown itself which is used to add documentation to your file (or write your report). We will cover markdown in the next tutorial.

Activity: Customize your R Markdown File's Front Matter - YAML

Customize the header of your `.Rmd` file as follows:

- **Title:** Provide a title that fits the code that will be in your RMD.
- **Author:** Add your name here.
- **Date:** Today's date.
- **Output:** Leave the default output setting: `html_document`. We will be rendering an HTML file.