

# Module 1: Introduction to R and RStudio

Keaton Wilson, Ellen Bledsoe

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## Introduction to R/RStudio

### Learning Outcomes

- Students will be able to describe what computer programming languages (code) are, with R as an example.
- Students will be able to describe the role of RStudio in programming with R.
- Students will be able to describe the utility of each panel in RStudio.
- Students will be able to perform basic math functions in the R console.

### Check-in (5 minutes)

Let's all sign-up for RStudio Cloud!

### Rstudio Mini-tour

Perform a live-coding mini-tour of RStudio.

1. What the different panels do
2. Console versus a script/Rmarkdown file?

### Using R as a calculator

#### Using the Console

You can do basic math in the console (the bottom left part of the screen). The console only understands R code; we can type numbers and mathematical symbols.

Try multiplying 5 and 3 (hint: `*` means multiply) in the console. Hit **Enter** to run the line of code.

#### Rmarkdown and Code Chunks

Rmarkdown (.Rmd) is a file format that lets us incorporate text and code into one document seamlessly. In fact, it is the file format for this document!

- For writing text, you can type as you would normally
- Code chunks are a bit different.

- Type your R code in the lines under the {r}.
- To include text in them, you will need to put a # in front. R will not read anything after the # as code. Chunks look like this:

A quick shortcut for adding a code chunk is **Ctrl + Atl + i** (**Cmd + Opt + i** on a Mac). Alternatively, you can go to **Code > Insert Chunk**.

To run a chunk of code, click the green arrow on the far right side of the chunk. You can also run one or a few lines of code at a time by having your cursor on the line or highlighting multiple lines and hitting **Ctrl + Enter** (or **Cmd + Enter** on a Mac).

Let's work with an example code chunk.

```
# I am adding a comment to my code here.
```

```
432 - 11 # subtraction
```

```
## [1] 421
```

```
12 + 18 # addition
```

```
## [1] 30
```

```
8 / 4 # division
```

```
## [1] 2
```

```
3 * 5 # multiplication
```

```
## [1] 15
```

If you run code in the console (below) rather than the code chunk in a .Rmd file, you don't need to add the {r} to tell it that you are typing R code. The console only understand R code, so we don't need to tell it!

### Math: Small Group Challenge

Write a line of code to raise 2 to the 3rd power (often represented as  $2^3$ ). This will likely require a little bit of Googling to figure out.

First, write and run the code in the console. Next, write and run the code in the code chunk below. What did you have to do differently?

```
2^3
```

```
## [1] 8
```