EPSY 5261 : Introductory Statistical Methods

Day 2

Introduction to Coding

Learning Goals

- At the end of this lesson, you should be able to…
  - Read basic code
  - Write basic code
  - Explain the structure of a function for coding

Grilled Cheese Activity

Write instructions to make a grilled cheese….

Introduction to Coding

Coding

- Computers understand code
- To write code for the computer to "run" or "execute" we write *functions*

Functions

Functions are used to “do” things. For example, to create a grilled cheese we might use the following function:

```
butter_bread()
```

This function allows us to (figuratively) butter some bread.

Arguments

Functions often include **arguments** that specify options for the function.

```
butter_bread(type = "wheat")
```

Here the argument `type=` is used to indicate what type of bread to butter. We assigned that argument the option `"wheat"`.

Example Continued

```
butter_bread(type = "wheat")
```

The function is `butter_bread()`
The argument is `type`
The argument option we assigned is `"wheat"`

Your Turn

```
fry_sandwich(time = 5)
```

The function is:

The argument is:

The argument option we assigned is:

Notice!

The syntax has a specific structure and semantic. If the structure isn't correct, the computer won't give you the right output - it might give you nothing! Or, it might give you an error!

```
butter_bread(type = "wheat")
```

- **Functions (and arguments) have particular names;** in `butter_bread()` there is an underscore in the function name and it is all lower case letters…it is not `Butter_Bread()` or `butterbread()`
- The functions always include **parenthesis**
- The option in the argument is assigned with an equal sign; type = "wheat"
- Option in the argument are enclosed in **quotation marks** for words (character strings) and **not in quotation marks** for numbers (numeric values)

In R...

- Parenthesis matter
- Capitalization matters
- Quotes must be used correctly

Reading Code

Reading code has been shown to help learners better understand and write their own code. Here we read the "+" as "*and then do*"

```
butter_bread(type = "wheat") +
add_cheese(flavor = "colby") +
fry_sandwich(time = 6)
```

Looking Ahead

- We will use R Studio (which runs R) for writing and analyzing code
- In class and in the textbook you will be introduced to the R functions and arguments you need for the course.
- On the lab assignments, you will need to use these functions and arguments by modifying them (e.g., using `type="American"` rather than `type="colby"`)

Danger: Learning Ahead

You will make syntactical mistakes as you code (e.g., misspelling, forgetting a parenthesis). This is a natural part of the learning process—and even happens to expert coders. Learning how to de-bug code is just as important as learning to code.