Intro to R: Week 1

Topics Covered: Variables, Operations, Data Types, Indexing, Which and If Statements

Task 1: Create a variable called `a` to store the number 5

- Variables store values or objects so that they can be accessed later
- In R, we use `<-` to assign values or objects to variables and `=` to set function arguments. The shortcut for `<-` in RStudio is alt-.
- In RStudio you can run the current line of code with the shortcut Ctrl+Enter or Command+Enter

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Task 2: Translate the statement "b gets 10" to code. Is `a` equal to `b`? Which is greater, `a` or `b`?

Task 3: Add, subtract, multiply, and divide a and b and store the reults as new variables

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Task 4: Use the function `c()` to create a variable to store the numbers from 1 to 10.

- In R, round braces are used for function calls: `function(arguments go here)`

Task 5: use `seq()` and `:` to re-generate identical vectors

Task 6: Use 'seq()' to create a vector of odd numbers between 1 and 20. How many numbers are in this new vector?

Task 7: Add, subtract, multiply, and divide `x` and `y`. What happens?

- These are all element-wise operations, so they operate on each element of the vector individually

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Task 8: Multiply `a` by `x`. What happens?

- Create a variable `c` that stores the values 1 and 2 and multiply it by `x`. What happens?
- Create a variable `d` that stores the values 1, 2, and 3 and multiply it by `x`. What happens?
- If you get a warning message, this is an FYI from R that what you meant to do might not be what actually happened. It's a heads up, but doesn't impact the result. Error messages are different. They halt the execution of the code.

Task 9: Add all of the numbers in x and y together into a single value using `sum()`. Multiply the sum of `x` by the sum of `y`.

Task 10: Store your name in a variable called `name`. Multiply your name by 5.

- The variable `my.name` is not numeric, so it can't be multiplied by 5
- There are four basic types of data: numeric, integer, character, logical

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Task 11: Create four vectors, one of each data type, and check their type using the function 'class()'

Task 12: You just got back from a marine mammal survey and you saw 5 fin, 2 blue, 14 humpback, 0 minke, and 1 gray whale. Create vectors to store the species names and the number of whales seen. Combine these vectors into a single object. From this variable, extract the number of humpback whales seen.

- In R, square brackets are used for indexing within objects: `object[index]`

Task 13: What was the maximum number of whales seen and which species was it? Did you see zero of any species? Which?

Task 14: Whenever you see more than 15 whales in total, you report that you saw many, but when you see less than 15, you report that you saw few. Use an `ifelse()` statement to indicate whether you should report few or many whales.

- Curly braces are used for statements, mostly in conjunction with `if`, `for`, and function definitions.

Task 15: Store your information about whales as RData and .csv files