Tutorial 11 - Programming and custom functions in R

Cheat Sheets

We know there are a lot of functions and syntax with R. As we said at the beginning of the semester, this is like a philosophy and language class all in one. You are learning a new way to think and a new language (actually two)!

- ▶ Don't forget the handouts we gave you about data structures in R and reading/writing files. This describes a lot of functions.

- ▶ Don't forget about the general R cheat sheet from last week

- ▶ Don't forget that Google is the ultimate, interactive cheat sheet

The cheatsheets we mention here are linked from today's tutorial page

Y'all are doing great!

We've noticed that many of you will be very worried about your code when you come to office hours or ask for help in class, but then have code that is 85% or more of the way to the right answer. This is a very good sign. You will always feel a bit uncertain about your coding skills because there is always more you can know.

- ▶ Be confident in your growing coding skills!
- ▶ Be adventurous when coding! After all, you can't break anything.
- ▶ Be wise and use Google (and your instructors) for help when you are unsure!

Themes from Muddy & Clear

Muddy responses showed questions about these concepts (in order of frequency):

1) if-else statements

2) custom functions

3) for loops

4) indexing

We are going to work through challenges today that cover all of these, but focus on 1 & 2. If you are still struggling a lot with 3 & 4, find a time to talk through these concepts with an instructor!

Reminder

Office hours are available for y'all to get help with any aspect of class

You can find links to office hours in the forums section of the class Sakai page!

Challenge #1

Use `ants.csv`, a `for` loop, and the function `paste()` to make R sing "The Ant Go Marching".

Remember the first verse of that song goes like this:

The ants go marching one by one, hurrah, hurrah

The ants go marching one by one, hurrah, hurrah

The ants go marching one by one

The little one stops to suck his thumb

And they all go marching down to the ground

To get out of the rain, BOOM! BOOM! BOOM!

Challenge #2

You have asked students in your biocomputing class to create a function that randomly creates a text file with any number of lines between 1 and 20 with a single number on each row, but the sum of numbers in the file must be less than 100. You, as the instructor, have to check each file, but want to do it in an automated way.

Write a function that determines whether a file (provided as an argument and assumed to be in the present working directory) contains numbers that sum to more or less than 100 and returns "The file is correct, A+!" or "Sorry but you have failed. :(" depending on whether the file meets the defined criteria.

You have asked students in your biocomputing class to create a function that randomly creates a text file with any number of lines between 1 and 20 with a single number on each row, but the sum of numbers in the file must be less than 100. You, as the instructor, have to check each file, but want to do it in an automated way.

Now do the assignment you gave to your students!

Exercise 9

Exercise 9 is **not required**. However, you can complete it for extra credit. It is worth up to 2 points in the Graded Exercises portion of your grade.

The question on this exercise asks you to pull all of the pieces of R programming together, and therefore is a challege but great practice for you.