

Week 3 Lab problems

EEB 429

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A. Logical operators

In a new R-script:

1. **Write a function** that takes a number as input and returns “TRUE” if the number is less than 6. Execute this function on a number of your choice.
2. **Write a function** that takes a number as input and returns “TRUE” if the number is greater than 2 **and** less than 6. Execute this function on a number of your choice.
3. Verify that both these functions work for a vector by executing them on a vector that has numbers from 1 to 10. (You can make this vector manually, but remember there’s a nifty shortcut to doing it)
4. You are an ecologist studying how habitat affects the growth of adult salamanders. You know that adult male salamanders are always between the lengths of **5 cm and 10 cm**. You also know that adult female salamanders are always between **12 cm and 15 cm** in length. **Write a function** that takes in a vector of *salamander lengths* in cm and returns TRUE for each length that is sensible (i.e., lies between the range of lengths described above). Challenge: Try to do this in a single line of code in the function’s body!

Submit your inputs and outputs for part 1-3, and your function for part 4 to earn full credit for this question.

B. Plotting (base R)

Create a new R-script, and:

1. Use the plot function to plot the weight (wt) of different cars against their mpg from the mtcars dataset. Modify the arguments so that the plot is a line-plot and not a scatter plot.
2. Use the lines function to add another line to the **same** plot that is a plot of the weight against the car’s horse-power (hp).
3. Make the two lines a different color.
4. Optional: Make the plot as fancy as you can in the time remaining! (You can work as a group and submit the same figure)

For full-credit, submit a single plot for parts 1 to 3. With two lines of different colors.

C. If-else and for loops

1. Create a list of the names of all students in the lab section, labeled by their uniqlname.

2. Create a **function** that takes in (a) a list of students, and (b) the unqiename of a student, and returns their full name.
3. Create another **function** that does the opposite, i.e., it takes in a list of students and their full-name, and returns their unqiename. You will have to use a for loop to iterate over the list and compare each full-name!

For full-credit, submit your inputs and outputs for the list in part 1 and the functions for part 2 and 3 (along with an output of the functions being executed on an example list)