

Module 1 Lab: fundamentals

BIOSTAT 213: Introduction to Computing in the R Software Environment

Wednesday, January 16, 2019

Save your code in a script file. I suggest adding labels and notes to this script file as comments. You may work in groups of 2–3.

1. Write code to find the first 10 powers of 2, beginning with 1 (ie, 2^1 , 2^2 , etc), preferably all in one line. Hint: you may need some parentheses.
2. Type `1:10+4`. In another line, type `1:(10+4)`. Run these two lines of code, and compare the results. What do the results suggest about orders of operation? In other words, is `:` or `+` prioritized first?
3. Imagine that you are trying to estimate an individual's body mass index (BMI). The individual is in your office. You measure the individual to weigh 140 pounds. However, for whatever reason, though your office has a scale, it lacks a measurement instrument for height/length. Using your experience (and perhaps your own height), you guess the individual to be between 5 ft 7 in and 5 ft 10 in tall. Because BMI will necessarily decrease as height increases (in mathematical terms: the relationship is monotonic), you can use this range to calculate a range for the individual's BMI. Write code to do this, preferably all in one line. BMI is defined as: $(\text{pounds})/(\text{inches})^2 \times 703$.
4. I did not write the message on slide 11 by writing the sentence 10 times (or copying and pasting 9 times). Write code that can generate that message.
5. R contains a predefined character object, `letters`, that contains the 26 letters of the English alphabet. The length of the object is 26: each *element* (or: member) is one of the 26 letters of the alphabet. Write code that will combine the letters together into a single character string, representing the alphabet, without spaces.
6. In general, it can be confusing performing math on vectors of different lengths, unless one of the vectors is just a single number (I personally avoid it). Type the following: `(1:6)+(1:2)`. Run the code and examine the output. How did R do the math?
7. Type the following: `(1:6)+(1:4)`. Run the code and examine the output. Why did this code result in an error message?