

1.
  - a) In class we discussed using the `ls()` function to list objects that we have created in our workspace. We also created a number of objects during the course of the lecture. Use the `ls()` command to create a list of the objects in your R workspace.
  - b) We also discussed how to use the `rm()` command to remove objects from your workspace. In part a) above, you should have found a variable named `z`. Try removing `z`.
  - c) What happens now if you try to look at `z` by typing `z` in the R console? What does R print?
  - d) We discussed different ways of looking through previous commands to reuse them. Using one of these methods find the the command that you initially used to create `z`, and then re-create it. Try doing the same thing, but modify the variable name to call the object `newZ`
2. This question will require you to open a script file that I have written for you called 'Exercises1.R'. Open this script file to complete the following exercises.
  - a) Using either copy and paste, or highlighting and pressing ctrl-r run the lines of code one-by-one to see what they do. Eventually you should see both of the graphs that were demonstrated earlier in the presentation.
  - b) I have used a new command in this script file called `attach()`. Using R help, try to discover what the `attach()` function does. There is more than one way to access the help, so use whichever method appeals to you. Don't worry if you find the R help description a little cryptic, this is normal!
  - c) Now run the command `detach()`. After doing this, try to draw histogram again without running the `attach()` function (It shouldn't work!). What does this suggest to you about the use of `attach()` and `detach()`?
  - d) We are going to make some changes to the script file. Before we do this, save the script file under a different name of your choosing. This is so you can go back to the original script file in case any of the changes don't work out.
  - e) Before doing this question, make sure that the `ChickWeight` data set has been attached (see part b). Look at the command for drawing the second more complicated histogram. Recall our discussion on arguments for functions. The items `breaks=`, `freq=`, `col=`, `main=` are all optional arguments for the histogram command. Choose one of these arguments, and see if you can change it. How does changing this argument change the histogram?
3. Refer to the information on arithmetic expressions and the order of operations, mathematical expressions, and logical values to answer the following question.
  - a) Create your own arithmetic formula for R to evaluate. Try to include at least one out of each of the following: brackets, exponents, (multiplication or division), (addition or subtraction). Hint: Type your formula into the script file you saved earlier so that you can access it in b).
  - b) We also talked about mathematical expressions, and I provided a table on some common mathematical expressions. Choose one of these expressions, and the argument for it, and substitute it into the arithmetic formula you made above. How does R evaluate this? Does including a mathematical function as part of an equation change the order of operations?
  - c) Do the same thing as above, only use a logical expression rather than a mathematical expression. For example, rather than writing `log(x) . . .`, substitute something like `(x==9)`. Does R evaluate this expression? What does this suggest to you about the nature of logical values in R? Hint: Don't forget the brackets!