

Session 3 Recitation

1. Store the following vector of 15 values as an object in your workspace: `c(9, 9, 7, 3, 6, 7, 9, 6, 3, 6, 6, 7, 1, 9, 1)`. Identify the following elements using R logicals.
 1. Those values greater than 6.
 2. Those values greater than or equal to 6.
 3. Those less than $6+2$
 4. Those not equal to 6.
2. Create a new vector from the one used in (1) by deleting its first three elements. With this new vector, fill a $2 \times 2 \times 3$ array. Examine the array for the following entries:
 1. Those less than or equal to 6 divided by 2, plus 4
 2. Those less than or equal to 6 divided by 2, plus 4, after increasing every element in the array by 2
3. Recreate exactly the following output with R:

```
"ATGCCCGTTTATAT
  GGCAAATATA
    TATAT"
```
4. Suppose you've stored the values of `num1 <- 4` and `num2 <- 0.75`. Write a line of R code that returns the following string:

```
[1] "The result of multiplying 4 by 0.75 is 3."
```
5. Store the string "AAGGCCTTAGGCGGTTTCC" Then do the following:
 1. Use the substring function to find the sequence between indices 9 and 15.
 2. Correct this substring within the whole string to have the Shine-Dalgarno sequence "AGGAGGT".
6. Create a factor with the data: April, January, December, September, November, July, July, and June. Figure out how to put all the rest of the months in the factor as levels.
7. Create a list that contains, in this order, a sequence of 20 evenly spaced numbers between -4 and 4; a 3×3 matrix of the logical vector `c(F, T, T, T, F, T, T, F, F)` filled column-wise; a character vector with the two strings "Pro" and "Asp"; and a factor vector containing the observations `c("LOW", "MED", "LOW", "MED", "MED", "HIGH")`.
 1. Extract row elements 2 and 1 of columns 2 and 3, in that order, of the logical matrix.
 2. Use sub to overwrite "Pro" with "P" and "Asp" with "D" inside the list.
 3. Obtain all values from the sequence between -4 and 4 that are greater than 1.
8. Create and store this data frame in your R workspace:

Professor	Gender	Rank	
Stanislaus	M	Associate	
Francis	F	Associate	
Stephen	M	Assistant	
Roger	M	Full	

Make professor a character vector, gender a factor, and rank a factor.

1. Append a column with their ages: 41, 43, 15, 1600. Make the new column in the data frame called age.

Write single line of code that will extract from the data frame just the names and ages of any records where the individual is high-ranked and male.

9. Load the ChickWeight dataset that comes built-in to R. Display the first 13 records to the screen.

10. Read in the data table chickenResistance.txt from D2L. Identify all the chickens that are White Leghorns and female.

11. Write out your answer to (10) to a new file called chickenResistance_WLH_F.txt.