Homework 1 - R

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Due 1/18 - By Start of Class

How to submit your homework:

1. Download the r-homework1.R (save as from your browser) script and open in Rstudio
2. Rename `r-homework1.R` to `yourlastname_sudentID_r-homework1.R` (save as in RStudio)
3. Type the answers in the uncommented lines (those without #). Notice, for some lines, we have gotten you started with names of objects.
4. Save the script file.
5. Upload the file to tritonEd (we are working on getting that set up). Alternately, attach the file and email to timdennis@ucsd.edu by 1/18 before 6:30pm. NOTE: Please use your UCSD email address when sending an email.

Exercise 1 : Making Vectors (7.5 points)

Start by making a vector named 'myvector' with the numbers 1 through 26. Create another vector named, 'myvectimestwo' by multiply the vector by 2, and give the resulting vector names A through Z (hint: there is a built in vector called `LETTERS`)

Exercise 2 : Matrix (7.5 points)

1. Make a matrix called "mymatrix" containing the numbers 1:50, with 5 columns and 10 rows. Print the matrix out.
2. Make the "mymatrix" matrix above fill by row, not by column (its default behaviour). Print out the matrix. (hint: read the documentation for `matrix`!)

Exercise 3 : Data Frame (15 points)

You can create a new data frame right from within R with the following syntax:

```
df <- data.frame(id = c('a', 'b', 'c'),
                 x = 1:3,
                 y = c(TRUE, TRUE, FALSE),
                 stringsAsFactors = FALSE)
```

Make a data frame that holds the following information for yourself:

- first name
- last name
- lucky number

Column names should be first_name, last_name, & lucky_number Then use `rbind` to add an entry for someone else in the class or someone you know. Finally, use `cbind` to add a column named 'coffee' with each person's answer to the question, "Is it time for coffee break?"

Exercise 4 : Lists (5 points)

Given the following list:

```
xlist <- list(a = "Software Carpentry", b = 1:10, data = head(iris))
```

Using your knowledge of both list and vector subsetting, extract the **number 2** from xlist. Hint: the number 2 is contained within the "b" item in the list. Look up how to subset lists from the lecture notes.

Exercise 5 : Subsetting gapminder (15 points)

To answer these questions, you will need gapminder data loaded. Below I'll load it from the web. When you run it you should see a 'gapminder' data object in the 'Environment' on the top right of RStudio.

```
gapminder <- read.csv("https://raw.githubusercontent.com/swcarpentry/r-novice-gapminder/gh-pages/_episo
```

Fix each of the following common data frame subsetting errors: WRAP the answers in the head() function to reduce the output to the console and log. For example, to get the first three rows and 2-3 columns:

1. Extract observations collected for the year 1957

   ```
   gapminder[gapminder$year = 1957,]
   ```

2. Extract all columns except 1 through to 4

   ```
   gapminder[,-1:4]
   ```

3. Extract the rows where the life expectancy is longer the 80 years

   ```
   gapminder[gapminder$lifeExp > 80]
   ```

4. Extract the first row, and the fourth and fifth columns (`lifeExp` and `gdpPercap`).

   ```
   gapminder[1, 4, 5]
   ```

5. Advanced: extract rows that contain information for the years 2002 and 2007

   ```
   gapminder[gapminder$year == 2002 | 2007,]
   ```