

## Analysis of Environmental Data

### DataCamp: Lab1 R Fundamentals 1 - Questions

Q1 : Explain why the outputs of the two lines are different.

The output of the two lines are different because one contains integers (will be interpreted) while the other one is a string of literal text induced by quotes (meaning it is not interpreted)

Q2: Is `c_1` a variable, or a function? How do you know?

It is a function. The function creates a vector which is indicated through `c()`. The function is assigned the name `c_1`.

Q3: Is `c_2` a variable, or a function? How do you know?

It is a variable. You can tell by the equals symbol and the quotation marks that the variable is assigned a character string. That is not a function.

Q4: If `c_1` and `c_2` have different values, why?

One is in quotation marks (character) and the other is not (integer). `c_2` will only return a character string, while `c_1` will run a function.

Q5 (1 pt.): What are the dimensions of the matrix (i.e. how many rows and columns)?

3 rows and 2 columns

Q6 (2 pts.): Write R code to retrieve the element of `mat_1` that has a value of 3.

```
mat_1[3,1]
```

Q7 (1 pt.): Paste the code you used to create `mat_2`.

```
mat_2 = matrix(my_vec, nrow = 2)
```

Q8 (1 pt.): Paste the code you used to create `mat_3`.

```
mat_3= matrix(my_vec, nrow = 3)
```

Q9 (1 pt.): Did R use rows or columns to recycle/distribute the values in `my_vec`?

Rows.

Q10 / 11: Using `my_vec`, create a matrix, `mat_4`. `mat_4` must have a total number of elements that is not a multiple of 3. How did R handle the recycling/distributing of values of `my_vec` in `mat_4`?

It is not possible since the data length [6] is not a divisor or multiple of the number of rows [4].

Q12 (8 pts.): For each of the 8 lines, answer the following: A. Did the line return a 1: value, 2: error, or 3: NULL? B. What type of subsetting operation was used (or attempted)? C. If it did not return an error describe, in ordinary English, a plausible explanation of how R could have performed the subsetting.

1 A: Value	B: by position	C: searched for the numbered position of the component
2 A: Value	B: by position	C: turned string into a numeric ( <code>as.numeric</code> ) and searched for position
3 A: NULL	B: by name	C: searched for the title „1“ which does not exist. It only exists as character string
4 A: Value	B: by name	C: searched for the title „one“ which is the second element in the list. Works because the title exists in that way
5 A: Value	B: by name	C: searched for the title „one“ through dollar sign
6 A: Value	B: by name	C: searched for the title „one“ through dollar sign, quotation marks work because it is a character string
7 A: Error	B: by name	C: code not working because title does not exist, there is no title 1. And you can't use it to look for positions, only for titles.
8 A: NULL.	B: by name	C: it is looking for a character through quotation marks

Q13 (2 pts.): Identify which lines produced the string output "five point two" and explain why.

```
> my_list_1[["one"]]
[1] "five point two"
> my_list_1$one
[1] "five point two"
> my_list_1$"one"
[1] "five point two"
```

Because the second component of the list has the title `$one`. You can either subset that component by typing `$one` or by putting the title into double brackets. The quotation marks are not needed in the third case but can be applied since the title is a string.

Q14 (1 pt.): Identify which lines produced NULL output and explain why.

```
> my_list_1[["1"]]
NULL

> my_list_1$"1"
NULL
```

NULL is returned because no title in the list has been found named 1. Both times the character string „1“ is searched, indicated through the quotation marks in the first case and through the \$ sign in the second case. The code actually is correct, which is why no error is returned. But the value we are looking for does not exist because there is no data named „1“. Therefore a NULL is returned.