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ECO 634 Lab 1: R Fundamentals 1

**Expressions and Strings**

1. Running the line, c(1,2,3) outputs [1] 1 2 3, while running the line, “c(1,2,3)” outputs “c(1,2,3)” because the line “c(1,2,3)” is a string

**Variables**

1. c\_1 is a variable because it is storing the values of: c(1,2,3) within the variable assignment of c\_1. It is not a function because it is not telling (directing?) R to perform a specific task (such as print(), or addition.)
2. c\_2 is also a variable, although it is a different data type from c\_1 (c\_1 is numeric, while c\_2 is character,) it is still storing the string of text: “c(1,2,3)” within the variable assignment of c\_2.
3. c\_1 and c\_2 have different values because they are different data types. c\_1 ((c(1,2,3)) is numeric while c\_2((“c(1,2,3)”)) is character.

**Matrices 1**

1. The matrix (mat\_1) has 3 rows and 2 columns.
2. I used the following code to retrieve the element of mat\_1 that has a value of 3:



**Matrices 2**

1. The following code was used to create mat\_2: A picture containing chart

   Description automatically generated
2. The following code was used to create mat\_3:

A picture containing graphical user interface

Description automatically generated

1. R used columns to recycle/distribute the values in my\_vec. Since *byrow()* was not specified as TRUE or FALSE, R assumed the default of FALSE, for which the matrix was filled by columns.

Graphical user interface, application

Description automatically generated

1. Since the number of rows and columns are not multiples of 3, (I used 4 rows, 5 columns,) r compensated for each blank space (ie every mis-matched row/column pairing) by recycling recycled the integers in the vector my\_vec.

**List Subsetting**

1. lines of code returns:

Graphical user interface, text, application

Description automatically generated

1. **Line 1: my\_list\_1[[1]]**
2. The line returned a value
3. The [[ subsetting operation was used
4. Since double brackets were used, the line of code is telling r to select the first element in my\_list\_1

**Line 2: my\_list\_1[[as.numeric(“1”)]]**

1. The line returned a value
2. The [[ subsetting operation was used.
3. Similarly, to line one, the double brackets are telling r to select the first element in my\_list\_1, except the quotations around 1 makes the element (“1”,) a string. The as.numeric function tells r to convert the character data type to numeric.

**Line 3: my\_list\_1[[“1”]]**

1. the line returned NULL
2. the [[ subsetting operation was attempted to be used**.**

**Line 4: my\_list\_1[[“one”]]**

1. The line returned a value
2. The [[ subsetting operation was used.
3. Since this line is subsetting “one” with double brackets, it is telling r to refer to the element in the list that is named “one.”

**Line 5: my\_list\_1$one**

1. The line returned a value
2. the $ subsetting operation was used
3. This line subsets the same way as the previous line 4 (my\_list\_1[[“one”]]) does. This line tells r to return the element in the list that is associated with the name one.

**Line 6: my\_list\_1$”one”**

1. The line returned a value
2. The $ subsetting operation was used.
3. Even though the quotation marks around one is used in this line, the code is telling r to perform the same subsetting as the previous line 5, returning the element in the list with the name assignment of “one.”

**Line 7: my\_list\_1$1**

1. the line returned an error that read “unexpected numeric constant in “my\_list\_1$1”
2. The $ subsetting operation was attempted to be used.
3. An error occurred because the $ subsetting operator is only applicable to selection of named elements. Thus, since 1 is numerical, r viewed it as unexpected and as an error.

**Line 8: my\_list\_1$ “1”**

1. The line returned NULL
2. The $ subsetting operation was attempted to be used.
3. Because the $ operator is used to extract elements based off of name, R returned this line of code as NULL because there is no element within my\_list\_1 with the exact name of “1.”
4. Lines 4, 5 and 6 produced the string output “five point two”
5. Lines 3 and 8 produced a null output.