Lab1.R

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#Lab 1  
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c(1, 2, 3)

## [1] 1 2 3

"c(1, 2, 3)"

## [1] "c(1, 2, 3)"

#Q1  
#c(1, 2, 3) is numeric, "c(1, 2, 3)" is character  
  
c\_1 = c(1, 2, 3)  
c\_2 = "c(1, 2, 3)"  
  
#Q2  
#function, c\_1 equals to a vector (no quotation marks)  
  
#Q3  
#variable, c\_2 equals to a character/string (has quotation marks)  
  
#Q4  
#c\_1 equals to a vector with elements 1, 2, and 3  
#c\_2 equals to a character called "c(1, 2, 3)"  
  
my\_vec = 1:6  
mat\_1 = matrix(my\_vec, nrow = 3)  
mat\_1

## [,1] [,2]  
## [1,] 1 4  
## [2,] 2 5  
## [3,] 3 6

#Q5  
#The matrix has 3 rows and 2 columns.  
  
#Q6  
mat\_1[3,1]

## [1] 3

#Q7  
mat\_2 = matrix(my\_vec, nrow = 2, ncol = 3)  
mat\_2

## [,1] [,2] [,3]  
## [1,] 1 3 5  
## [2,] 2 4 6

#Q8  
mat\_3 = matrix(my\_vec, nrow = 3, ncol = 2)  
mat\_3

## [,1] [,2]  
## [1,] 1 4  
## [2,] 2 5  
## [3,] 3 6

#Q9  
# R uses columns to recycle/distribute the values.  
  
#Q10  
mat\_4 = matrix(my\_vec, nrow = 2, ncol = 2)  
mat\_4

## [,1] [,2]  
## [1,] 1 3  
## [2,] 2 4

#Q11  
# R still uses columns to recycle/distribute the values.  
  
first = 5.2  
second = "five point two"  
third = 0:5  
my\_list\_1 = list(first, second, third)  
my\_list\_1

## [[1]]  
## [1] 5.2  
##   
## [[2]]  
## [1] "five point two"  
##   
## [[3]]  
## [1] 0 1 2 3 4 5

names(my\_list\_1) = c("two", "one", "three")  
my\_list\_1

## $two  
## [1] 5.2  
##   
## $one  
## [1] "five point two"  
##   
## $three  
## [1] 0 1 2 3 4 5

#Q12  
my\_list\_1[[1]]

## [1] 5.2

#value  
#by position  
#select the first element of the list  
my\_list\_1[[as.numeric("1")]]

## [1] 5.2

#value  
#by position  
#select the first element of the list  
my\_list\_1[["1"]]

## NULL

#NULL  
#By name  
#select the element called "1" in the list  
my\_list\_1[["one"]]

## [1] "five point two"

#value  
#by name  
#select the element called "one" in the list  
my\_list\_1$one

## [1] "five point two"

#value  
#by name  
#select the element called "one" in the list  
my\_list\_1$"one"

## [1] "five point two"

#value  
#by name  
#select the element called "one" in the list  
#my\_list\_1$1  
#error  
#by position but missing [[]] so not valid  
my\_list\_1$"1"

## NULL

#NULL  
#by name  
#select the element called "1" in the list  
  
#Q13  
my\_list\_1[["one"]]

## [1] "five point two"

my\_list\_1$one

## [1] "five point two"

my\_list\_1$"one"

## [1] "five point two"

#They all select the element called "one", which is "five point two".  
  
#Q14  
my\_list\_1[["1"]]

## NULL

my\_list\_1$"1"

## NULL

#They both select the element called "1", which does not exist in the list.