Worksheet 3

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```r
#Using Vectors
```

```r
#a. You need to produce a vector that contains the first 11 letters.
LETTERs <- c('A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K')
LETTERs
```

```
##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K"
```

```r
#b. Produce a vector that contains the odd numbered letters.

LETTERS <- c("A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M",
             "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X", "Y", "Z")
LETTERS
```

```
##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S"
## [20] "T" "U" "V" "W" "X" "Y" "Z"
```

```r
LETTERS2 <- LETTERS[1:26 %% 2 !=0]
LETTERS2
```

```
##  [1] "A" "C" "E" "G" "I" "K" "M" "O" "Q" "S" "U" "W" "Y"
```

```r
#c. Produce a vector that contains the vowels. Based on the above vector
#   letters:

LETTER1 <- LETTERS[c(1, 5, 9, 15, 21)]
LETTER1
```

```
## [1] "A" "E" "I" "O" "U"
```

```r
#d. Based on the above vector letters produce a vector that contains the last 5
#   lowercase letters.

letters <- c("a", "b", "c", "d", "e", "f", "g", "h", "i", "j", "k", "l", "m", "n",
             "o", "p", "q", "r", "s", "t", "u", "v", "w", "x", "y", "z")
letters
```

```
##  [1] "a" "b" "c" "d" "e" "f" "g" "h" "i" "j" "k" "l" "m" "n" "o" "p" "q" "r" "s"
## [20] "t" "u" "v" "w" "x" "y" "z"
```

```r
Lowercase <- letters[c(22, 23, 24, 25, 26)]
Lowercase
```

```
## [1] "v" "w" "x" "y" "z"
```

#e. Produce a vector that contains letters between 15 to 24 letters in lowercase.

```r
Lowercase2 <- letters[c(16, 17, 18, 19, 20, 21, 22, 23)]
Lowercase2
```

```
## [1] "p" "q" "r" "s" "t" "u" "v" "w"
```

#2. Create a vector with the average temperatures in April for Tuguegarao City, Manila,
 #   Iloilo City, Tacloban, Samal Island, and Davao City. The average temperatures in
 #   Celcius are 42, 39, 34, 34, 30, and 27 degrees.

#a. What is the R code and its result for creating a character vector for the city/town of
 #   Tuguegarao City, Manila, Iloilo City, Tacloban, Samal Island, and Davao City? Name the
 #   object as city. The names should follow the same order as in the instruction.

```r
city <- c("Tuguegarao_City", "Manila", "Iloilo_City", "Tacloban", "Samal_Island", "Davao City")
city
```

```
## [1] "Tuguegarao_City" "Manila"          "Iloilo_City"     "Tacloban"
## [5] "Samal_Island"    "Davao City"
```

#b. The average temperatures in Celcius are 42, 39, 34, 34, 30, and 27 degrees.
 #   Name the object as temp.
 #   Write the R code and its output. Numbers should also follow what is in the instruction.

```r
temp <- c(42, 39, 34, 34, 30, 27)
temp
```

```
## [1] 42 39 34 34 30 27
```

#c. Associate the temperature temp with the city by using names() function. What is
 #   the R code and its result?

```r
names(temp) <- city
temp
```

```
## Tuguegarao_City          Manila     Iloilo_City        Tacloban     Samal_Island
##              42              39              34              34               30
##      Davao City
##              27
```

#e. From the answer in d, what is the content of index 5 and index 6? What is its R code?

```r
names1 <- temp[5:6]
names1
```

2

```
## Samal_Island    Davao City
##           30           27
```

#Using Matrices

#2. Create a matrix of one to eight and eleven to fourteen with four columns and three rows.

#a. What will be the R code for the #2 question and its result?

```
Table1 <- matrix(c(1:8, 11:14), nrow = 3, ncol = 4)
Table1
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    4    7   12
## [2,]    2    5    8   13
## [3,]    3    6   11   14
```

#b. Multiply the matrix by two. What is its R code and its result?

```
output <- Table1*2
output
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    2    8   14   24
## [2,]    4   10   16   26
## [3,]    6   12   22   28
```

#c. What is the content of row 2? What is its R code?

```
content <- c(Table1[2,1], Table1[2,2], Table1[2,3], Table1[2,4])
content
```

```
## [1]  2  5  8 13
```

#d. What will be the R code if you want to display the column 3 and column 4 in row 1
 #   and row 2? What is its output?

```
content <- c(Table1[1,3], Table1[1,4], Table1[2,3], Table1[2,4])
content
```

```
## [1]  7 12  8 13
```

#e. What is the R code is you want to display only the columns in 2 and 3, row 3?
 #   What is its output?

```
content <- c(Table1[3,2], Table1[3,3])
content
```

```
## [1]  6 11
```

```r
#f. What is the R code is you want to display only the columns 4? What is its output?

content <- c(Table1[1,4], Table1[2,4], Table1[3,4])
content
```

```
## [1] 12 13 14
```

```r
#g. Name the rows as isa, dalawa, tatlo and columns as uno, dos, tres, quatro
#   for the matrix that was created in b.'. What is its R code and corresponding output?

dimnames(output) <- list(c("isa", "dalawa", "tatlo"),c("uno", "dos", "tres", "quatro"))
output
```

```
##        uno dos tres quatro
## isa      2   8   14     24
## dalawa   4  10   16     26
## tatlo    6  12   22     28
```

```r
#h. From the original matrix you have created in a, reshape the matrix by assigning a
#   new dimension with dim(). New dimensions should have 2 columns and 6 rows. What will
#   be the R code and its output?

dim(Table1) <- c(6,2)
Table1
```

```
##      [,1] [,2]
## [1,]    1    7
## [2,]    2    8
## [3,]    3   11
## [4,]    4   12
## [5,]    5   13
## [6,]    6   14
```

```r
#Using Arrays
```

```r
#3. An array contains 1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1
```

```r
#a. Create an array for the above numeric values. Each values will be repeated twice
#   What will be the R code if you are to create a three-dimensional array with
#   4 columns and 2 rows. What will be its output?

arr <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)
arr
```

```
##  [1] 1 2 3 6 7 8 9 0 3 4 5 1
```

```r
arr2 <- array(rep(arr, 2), dim = c(2,4,3))
arr2
```

```
## , , 1
##
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    3    7    9
## [2,]    2    6    8    0
##
## , , 2
##
##      [,1] [,2] [,3] [,4]
## [1,]    3    5    1    3
## [2,]    4    1    2    6
##
## , , 3
##
##      [,1] [,2] [,3] [,4]
## [1,]    7    9    3    5
## [2,]    8    0    4    1
```

```r
#b. How many dimensions do your array have?
#    It has three dimensions

dim(arr2)
```

```
## [1] 2 4 3
```

```r
#c. Name the rows as lowercase letters and columns as uppercase letters starting from
#   the A. The array names should be "1st-Dimensional Array", "2nd-Dimentional Array", and
#   "3rd-Dimensional Array". What will be the R codes and its output?

dimnames(arr2) <- list(letters[1:2], LETTERS[1:4], c("1st-Dimensional Array",
"2nd-Dimensional Array", "3rd-Dimensional Array"))
arr2
```

```
## , , 1st-Dimensional Array
##
##   A B C D
## a 1 3 7 9
## b 2 6 8 0
##
## , , 2nd-Dimensional Array
##
##   A B C D
## a 3 5 1 3
## b 4 1 2 6
##
## , , 3rd-Dimensional Array
##
##   A B C D
## a 7 9 3 5
## b 8 0 4 1
```