# Worksheet 3

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```r
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 <- 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")



#Based on the above vector LETTERS:
# a. You need to produce a vector that contains the first 11 letters.
LETTERS[1:11]
```

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

```r
#b. Produce a vector that contains the odd numbered letters.
oddLETTERS <- c(LETTERS[1:26 %% 2 != 0])
oddLETTERS
```

```
##  [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:
vowelLetters <- c("A", "E", "I", "O", "U")
vowelLetters
```

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

```r
#d. Produce a vector that contains the last 5 lowercase letters.
letters[22:26]
```

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

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

letters [15:24]
```

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

```r
#2a. 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.

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.

```
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?

```
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?

```
temp[5]
```

```
## Samal Island
##           30
```

```
temp[6]
```

```
## Davao City
##         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?
```
matr <- matrix(c(1:8, 11:14), nrow = 3, ncol = 4)
matr
```

```
##      [,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?
```
new <- matr * 2
new
```

```
##      [,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?
```
matr[2,]
```

```
## [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?
matr[c(1,2), c(3,4)]
```

```
##      [,1] [,2]
## [1,]   7   12
## [2,]   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?
matr[c(3), c(2,3)]
```

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

```
#f. What is the R code is you want to display only the columns 4? #What is its output?
matr[,4]
```

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

```
#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?
matr <- matrix(c(1:8, 11:14), nrow = 3, ncol = 4)
dimnames(matr) <- list(c("isa", "dalawa", "tatlo"), c("uno", "dos", "tres", "quatro"))
matr
```

```
##        uno dos tres quatro
## isa      1   4    7     12
## dalawa   2   5    8     13
## tatlo    3   6   11     14
```

```
#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(matr) <- c(6, 2)
matr
```

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

```
#Using Array
```

```
#3. An array contains 1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1
#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?
array_dta <- array( c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1), c(2,4,3))
array_dta
```

```
## , , 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
```

```
#b. How many dimensions do your array have?
dim(array_dta)
```

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

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

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