

# RWorksheet\_Cartoja#3a

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#Using Vectors

#1. There is a built-in vector LETTERS contains the uppercase letters of the alphabet #and letters which contains the lowercase letters of the alphabet. LETTERS ## "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 ## "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.

```
let<- LETTERS[1:11]
let
```

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

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

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

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

#c. Produce a vector that contains the vowels

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

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

#Based on the above vector letters: d. Produce a vector that contains the last 5 lowercase letters.

```
let <- letters[21:26]
let
```

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

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

```
let <- letters[15:24]
let
```

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

#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.

```
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?

```
names_56 <- temp[5:6]
names_56
```

```
## 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?

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

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

```
result <- table * 2
result
```

```
##      [,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?

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

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

```
content <- c(table[2,1], table[2,2], table[2,3], table[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?

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

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

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

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

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

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

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

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

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

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

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

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

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

```
## [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?

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

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

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

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

```
##      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?

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

```
## Warning in matrix(1:8, 11:14, nrow = 3, ncol = 4): data length [8] is not a sub-
## multiple or multiple of the number of rows [3]
```

```
table
```

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

```
newtable <- c(1,2,3,4,5,6,7,8,11,12,13,14)
newtable
```

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

```
x <- matrix(newtable, nrow = 6, ncol = 2)
x
```

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

```
dim(x)
```

```
## [1] 6 2
```

#Using Arrays

#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?

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

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

```
y <- array(rep(x, 2), dim = c(2,4,3))
y
```

```
## , , 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? # It has 3 dimensions.

#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-Dimensional Array”, and “3rd-Dimensional Array”. #What will be the R codes and its output?

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

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

```
y <- array(rep(x, 2), dim = c(2,4,3))
y
```

```
## , , 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
```

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

```
## , , 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
```