

# Worksheet-3a in R

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```
##1.
```

```
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"
```

```
##BASED ON LETTERS
```

```
#a)
```

```
LET1 <- c(LETTERS[1:11])
LET1
```

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

```
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"
```

```
#b)
```

```
LET2 <- c(LETTERS[seq(1, 26, 2)])
LET2
```

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

```
#c)
```

```
vowels <- LETTERS[LETTERS %in% c("A", "E", "I", "O", "U")]
print(vowels)
```

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

```
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"
```

```
#BASED on letters
```

```
#d)
```

```
let1 <- c(letters[22:26])
```

```
let1
```

```
## [1] "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"
```

```
#e)
```

```
let2 <- c(letters[16:23])
```

```
let2
```

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

```
##2.
```

```
#a
```

```
city <- c("Tuguegarao City","Manila","Iloilo City","Tacloban","Samal Island","Davao City")
```

```
#b
```

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

```
#c
```

```
table1 <- data.frame (
```

```
  City=city,
```

```
  Temperature=temp
```

```
)
```

```
table1
```

```
##           City Temperature
```

```
## 1 Tuguegarao City         42
```

```
## 2      Manila           39
```

```
## 3   Iloilo City           34
```

```
## 4     Tacloban           34
```

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

```
## 6     Davao City           27
```

```
#d
```

```
table2 <- data.frame(
```

```
  City=city,
```

```
  Temperature=temp
```

```
)
```

```
table2
```

```
##           City Temperature
## 1 Tuguegarao City         42
## 2      Manila             39
## 3   Iloilo City           34
## 4     Tacloban            34
## 5   Samal Island          30
## 6     Davao City           27
```

```
#e
str(table1)
```

```
## 'data.frame':   6 obs. of  2 variables:
## $ City      : chr  "Tuguegarao City" "Manila" "Iloilo City" "Tacloban" ...
## $ Temperature: num  42 39 34 34 30 27
```

```
str(table2)
```

```
## 'data.frame':   6 obs. of  2 variables:
## $ City      : chr  "Tuguegarao City" "Manila" "Iloilo City" "Tacloban" ...
## $ Temperature: num  42 39 34 34 30 27
```

```
#Counted the variables per table and the date inside the object.
```

```
#f
table2[3:4,]
```

```
##           City Temperature
## 3 Iloilo City           34
## 4   Tacloban            34
```

```
#g
city_highest <- table2$City[which.max(table2$Temperature)]
city_lowest  <- table2$City[which.min(table2$Temperature)]

paste("City with highest temperature:", city_highest )
```

```
## [1] "City with highest temperature: Tuguegarao City"
```

```
paste("City with lowest temperature:", city_lowest )
```

```
## [1] "City with lowest temperature: Davao City"
```

```
##1. MATRIX
```

```
# row = 2
matrix(c(5,6,7,4,3,2,1,2,3,7,8,9),nrow = 2)
```

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

```
# row = 3 and column = 2
matrix(data = c(3,4,5,6,7,8),3,2)
```

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

```
# creating a diagonal matrix where x value will always be 1
diag(1,nrow = 6,ncol = 5)
```

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

```
diag(6)
```

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

##2.MATRIX

```
#a)
matrix_d2 <- matrix(c(1:8, 11:14),3,4)
matrix_d2
```

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

```
#b)
product_matrix <- matrix_d2 * 2
print(product_matrix)
```

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

```
#c
matrix_d2[2,]
```

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

```
#d
matrix_d2[1:2, 3:4]
```

```
##      [,1] [,2]
## [1,]    7  12
## [2,]    8  13
```

```
#e
matrix_d2[3, 2:3]
```

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

```
#f
matrix_d2[,4]
```

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

```
#g
rownames(matrix_d2)<-c("isa", "dalawa","tatlo")
colnames(matrix_d2)<-c("uno","dos","tres","quatro")
matrix_d2
```

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

```
#h
dim(matrix_d2)<-c(6,2)
matrix_d2
```

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

```
##ARRAY
```

```
# creates a two-dimensional array containing numbers from 1 to 24 that have 3 rows and 4 columns
array_dta <- array(c(1:24), c(3,4,2))
array_dta
```

```
## , , 1
##
##      [,1] [,2] [,3] [,4]
## [1,]    1    4    7   10
## [2,]    2    5    8   11
## [3,]    3    6    9   12
##
## , , 2
##
##      [,1] [,2] [,3] [,4]
## [1,]   13   16   19   22
## [2,]   14   17   20   23
## [3,]   15   18   21   24
```

```
# checking for the dimensions
# row, column, dimension
dim(array_dta)
```

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

```
#checking for the number of elements
length(array_dta)
```

```
## [1] 24
```

```
vectorA <- c(1:24)

# creating an array
an_Array <- array(vectorA, dim = c(3,4,2))
an_Array
```

```
## , , 1
##
##      [,1] [,2] [,3] [,4]
## [1,]    1    4    7   10
## [2,]    2    5    8   11
## [3,]    3    6    9   12
##
## , , 2
##
##      [,1] [,2] [,3] [,4]
## [1,]   13   16   19   22
## [2,]   14   17   20   23
## [3,]   15   18   21   24
```

```
##3.ARRAY
```

```
##a)
#Original values
values <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)
```

```
#Repeat twice
values_repeated <- rep(values, 2)

#Create 3D array with 2 rows, 4 columns
my_array <- array(values_repeated, dim = c(2, 4, 3))
print(my_array)
```

```
## , , 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)
dim(my_array)
```

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

```
length(dim(my_array))
```

```
## [1] 3
```

```
#b. It has 3 dimensions
```

```
##c)
rownames <- c("a", "b")
colnames <- c("A", "B", "C", "D")
dimnames_list <- list(rownames, colnames, c("1st-Dimensional Array", "2nd-Dimensional Array", "3rd-Dimensional Array"))

#Assigning dimnames to the array
dimnames(my_array) <- dimnames_list
print(my_array)
```

```
## , , 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
```