

RWorksheet_Basa#3a

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R Markdown

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`

```
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"
```

letters

```
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"
```

a. You need to produce a vector that contains the first 11 letters.

```
first11letters <- LETTERS[1:11]
first11letters
```

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

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

```
oddletters <- LETTERS[seq(1, length(LETTERS), by = 2)]
oddletters
```

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

c. Produce a vector that contains the vowels

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

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

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

```
last5lowercase <- letters[22:26]
last5lowercase
```

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

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

```
letters15_24 <- letters[15:24]
letters15_24
```

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

2. Create a vector(not a dataframe) 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. Create a dataframe to combine the city and the temp by using 'data.frame()'. What the R code and its result?

```
data <- data.frame(City = city, Temperature = temp)
data
```

```
##           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. Associate the dataframe you have created in 2.(c) by naming the columns using the names() function. Change the column names by using names() function as City and Temperature. What is the R code and its result?

```
names(data) <- c("City", "Temperature")
data
```

```
##           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. Print the structure by using str() function. Describe the output.

```
str(data)

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

- f. From the answer in d, what is the content of row 3 and row 4 What is its R code and its output?

```
data[3:4, ]
```

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

g. From the answer in d, display the city with highest temperature and the city with the lowest temperature. What is its R code and its output?

```
highest_temp_city <- data[which.max(data$Temperature), ]
lowest_temp_city  <- data[which.min(data$Temperature), ]
```

```
highest_temp_city
```

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

```
lowest_temp_city
```

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

Using Matrices a.

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

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

b.

```
matrix_multiply <- matrix_data * 2
matrix_multiply
```

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

c.

```
row2 <- matrix_data[2, ]
row2
```

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

d.

```
cols3_4_row1_2 <- matrix_data[1:2,3:4]
cols3_4_row1_2
```

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

e.

```
row3_cols2_3 <- matrix_data[3, 2:3]
row3_cols2_3
```

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

f.

```
col4 <- matrix_data[,4]
col4
```

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

g.

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

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

h.

```
reshape <- matrix(matrix_data, nrow = 6, ncol = 2)
reshape
```

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

Using Arrays 3. a.

```
num_values <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)
num_values_repeat <- rep(num_values, times = 2)
array_3d <- array(num_values_repeat, dim = c(2,4,3))
array_3d
```

```
## , , 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. There are 3 dimensions.

c.

```
dimnames(array_3d) <-list(c("a", "b"),c("A", "B", "C", "D"),c("1st-Dimensional Array", "2nd-Dimensional  
array_3d
```

```
## , , 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
```