

RWorksheet__anastacio#3a.Rmd

Kyle Johnsen Anastacio

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```
# Uppercase letters A to 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"
```

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

```
# Lowercase letters a to 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"
```

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

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

```
first_11 <- c(LETTERS[1:11])
first_11
```

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

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

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

```
odd_letters <- c(LETTERS[seq(1, length(LETTERS), 2)])
odd_letters
```

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

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

#c. Produce a vector that contains the vowels

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

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

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

#d. Produce a vector that contains the last 5 lowercase letters.

```
last_5 <- c(letters[22:26])
last_5
```

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

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

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

```
mid_lower <- c(letters[15:24])
mid_lower
```

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

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

```
#2
```

```
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"
```

```
#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.
```

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

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

```
#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
```

```
#output [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?
```

```
city_temp <- data.frame(city, temp)
city_temp
```

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

```
#Output           city temp
```

```
#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(city_temp) <- c("City", "Temperature")
city_temp
```

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

```
#Output 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(city_temp)
```

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

```
#Output '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?

```
city_temp[3:4, ]
```

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

```
#           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?

```
city_temp[which.max(city_temp$Temperature), ]
```

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

```
city_temp[which.min(city_temp$Temperature), ]
```

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

```
#output > city_temp[which.max(city_temp$Temperature), ]
#           City           Temperature
#1 Tuguegarao City           42
#> city_temp[which.min(city_temp$Temperature), ]
#           City           Temperature
#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?

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

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

```
#[,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?

```
mat2 <- mat * 2
mat2
```

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

```
#           [,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?

```
mat[2, ]
```

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

```
#Output [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?

```
mat[1:2, 3:4]
```

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

```
#      [,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?

```
mat[3, 2:3]
```

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

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

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

```
mat[, 4]
```

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

```
#[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?

```
rownames(mat2) <- c("isa", "dalawa", "tatlo")
colnames(mat2) <- c("uno", "dos", "tres", "quatro")
mat2
```

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

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

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

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

```
#      [,1] [,2]
#[1,]    1    7
#[2,]    2    8
#[3,]    3   11
#[4,]    4   12
```

```

# [5,]    5   13
# [6,]    6   14

#3. An array contains 1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1
values <- c(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_sample <- array(rep(values, 2), dim = c(2, 4, 3))
array_sample

## , , 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

# , , 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_sample)

## [1] 2 4 3

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

# Assign names for rows and columns
rownames(array_sample) <- letters[1:2]    # lowercase a, b
colnames(array_sample) <- LETTERS[1:4]    # uppercase A, B, C, D

# Assign names for each layer (dimension)
dimnames(array_sample) <- list(
  Row = letters[1:2],
  Column = LETTERS[1:4],
  Dimension = c("1st-Dimensional Array", "2nd-Dimensional Array", "3rd-Dimensional Array")
)

array_sample

```

```

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

```

```

# , , Dimension = 1st-Dimensional Array

#      Column
# Row A B C D
#  a 1 3 7 9
#  b 2 6 8 0

# , , Dimension = 2nd-Dimensional Array

#      Column
# Row A B C D
#  a 3 5 1 3
#  b 4 1 2 6

# , , Dimension = 3rd-Dimensional Array

```

```
# Column
#Row A B C D
# a 7 9 3 5
# b 8 0 4 1
```