RWorksheet#3

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2023-10-04

```
#Using Vectors
#1 There is a built-in vector LETTERS contains the uppercase letters of the alphabet and letters which

  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
```

```
##  [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"
```

```
#1a vector that contains the first 11 letters
  first_11 <- head(LETTERS,11)
  first_11
```

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

```
#1b vector that contains the odd numbered letters
  AllLetters <- LETTERS
  odd_Letters <-AllLetters[seq(1, length(AllLetters), by=2)]
  odd_Letters
```

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

```
#1c vector that contains the vowels
  vow_Letters <-LETTERS [c(1,5,9,15,21)]
  vow_Letters
```

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

```
#1d vector that contains the last 5 lowercase letters
  last_5 <- letters[c(22:26)]
  last_5
```

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

```
#e vector that contains letters between 15 to 24 letters in lowercase
fifteen_24 <- letters[c(15:24)]
fifteen_24
```

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

```
#2a

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

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

```
#c
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
```

```
#d
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
```

```
#e
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
```

```
# the code displayed the city_temp object's structure
# it displayed the contents and summary of the data frame

#f
twoRows <- city_temp[3:4,]

#g
highest <- city_temp[which.max(city_temp$Temperature),]
highest
```

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

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

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

```r
#USING MATRICES

#2a
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
```

```r
#b
mulMatr <- matr * 2
mulMatr
```

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

```r
#c
row_two <- mulMatr[2,]
row_two
```

```
## [1]  4 10 16 26
```

```r
#d
two_cols_andRows <- mulMatr[c(1,2),c(3,4)]
two_cols_andRows
```

```
##      [,1] [,2]
## [1,]   14   24
## [2,]   16   26
```

```r
#e
two_cols_oneRow <- mulMatr[3,c(2,3)]
two_cols_oneRow
```

```
## [1] 12 22
```

```r
#f
four_col <- mulMatr[,4]
four_col
```

```
## [1] 24 26 28
```

```r
#g
row_names <- c("isa", "dalawa", "tatlo")
col_names <- c("uno", "dos", "tres", "quatro")


#h
matr
```

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

```r
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
```

```r
#ARRAYS

#3a
values <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)
rep_values <- rep(values, each = 2)

arr <- array(rep_values, dim = c(2,4,3))
arr
```

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

```r
#3b
# three dimensions

#3c
dimnames(arr) <- list(
  letters[1:2], # row names
  LETTERS[1:4], # col names
  c("1st-Dimensional Array", "2nd-Dimensional Array", "3rd-Dimensional Array") # dim names
)
arr
```

```
## , , 1st-Dimensional Array
##
##   A B C D
## a 1 2 3 6
## b 1 2 3 6
##
## , , 2nd-Dimensional Array
```

```
##
##   A B C D
## a 7 8 9 0
## b 7 8 9 0
##
## , , 3rd-Dimensional Array
##
##   A B C D
## a 3 4 5 1
## b 3 4 5 1
```