RWorksheet_Cacho#3a

2024-10-01

```
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
first_11_letters <- LETTERS[1:11]
first_11_letters
```

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

```
# 1b
odd_letters <- LETTERS[seq(1, length(LETTERS), by = 2)]
odd_letters
```

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

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

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

```
# 1d
last_5_lowercase <- letters[22:26]
last_5_lowercase
```

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

```
# 1e
letters_15_to_24 <- letters[15:24]
letters_15_to_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"
```

```
# 2b
temp <- c(42,39, 34, 34, 30, 27)
temp
```

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

```r
# 2c
city_temp_df <- data.frame(city, temp)
city_temp_df
```

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

```r
# 2d
names(city_temp_df) <- c("City", "Temperature")
city_temp_df
```

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

```r
# 2e
str(city_temp_df)
```

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

```r
# 2f
city_temp_df[3:4,]
```

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

```r
# 2g
city_highest_temp <- city_temp_df[which.max(city_temp_df$Temperature),]
city_highest_temp
```

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

```r
city_lowest_temp <- city_temp_df[which.min(city_temp_df$Temperature),]
city_lowest_temp
```

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

```r
# Using Matrices
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
```

```r
matrix(data = c(3, 4, 5, 6, 7, 8), 3, 2)
```

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

```r
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
```

```r
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
```

```r
# 2a
value <- c(1:8, 11:14)
matrix_4x3 <- matrix(value, nrow = 3, ncol = 4)
matrix_4x3
```

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

```r
# 2b
matrix_multiplied <- matrix_4x3 * 2
matrix_multiplied
```

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

```r
# 2c
row2 <- matrix_4x3[2,]
row2
```

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

```r
# 2d
d_result <- matrix_4x3[1:2, 3:4]
d_result
```

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

```r
# 2e
e_result <-matrix_4x3[3, 2:3]
e_result
```

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

```r
# 2f
f_result <-matrix_4x3[,4]
f_result
```

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

```r
# 2g
rownames(matrix_multiplied) <- c("isa", "dalawa", "tatlo")
colnames(matrix_multiplied) <- c("uno", "dos", "tres", "quatro")
matrix_multiplied
```

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

```r
# 2h
dim(matrix_4x3) <- c(6, 2)
matrix_4x3
```

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

```r
# Using Array
array_dta <- array(c(1:24), c(3, 4, 4))
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
##
## , , 3
##
##      [,1] [,2] [,3] [,4]
## [1,]    1    4    7   10
## [2,]    2    5    8   11
```

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

```
dim(array_dta)
```

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

```
length(array_dta)
```

```
## [1] 48
```

```
# 2
vectorA <- c(1:24)

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
```

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

array_data <- array(vectorA, dim = c(2, 4, 3))
array_data
```

```
## , , 1
##
##      [,1] [,2] [,3] [,4]
## [1,]    1    3    5    7
## [2,]    2    4    6    8
##
## , , 2
##
##      [,1] [,2] [,3] [,4]
## [1,]    9   11   13   15
## [2,]   10   12   14   16
##
## , , 3
##
```

```
##      [,1] [,2] [,3] [,4]
## [1,]   17   19   21   23
## [2,]   18   20   22   24
```

```r
# 3b
dim(array_data)
```

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

```r
# 3c
dimnames(array_data) <- list(c("a", "b"), c("A", "B", "C", "D"), c("1st-Dimemsional Array", "2nd-Dimens

array_data
```

```
## , , 1st-Dimemsional Array
##
##   A B C D
## a 1 3 5 7
## b 2 4 6 8
##
## , , 2nd-Dimensional Array
##
##    A  B  C  D
## a  9 11 13 15
## b 10 12 14 16
##
## , , 3rd-Dimensional Array
##
##    A  B  C  D
## a 17 19 21 23
## b 18 20 22 24
```