Work Sheet #3a

Mikee Lorraine S. Benjamin

2025-10-20

Exercise 1

LETTERS:

a. First 11 letters

```
LETTERS[1:11]
```

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

b. Odd-numbered letters

```
LETTERS[seq(1, 26, by = 2)]
```

```
##  [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")]
```

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

letters:

d. Last 5 lowercase letters

```
tail(letters, 5)
```

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

e. Letters 15 to 24

```
letters[15:24]
```

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

Exercise 2

a. Character vector of cities

```
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. Temperature vector

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

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

c. Create a data frame

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

```
##              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. Rename columns

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

```
##              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. Structure of the dataframe

```
str(weather)
```

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

f. Content of rows 3 and 4

```
weather[3:4, ]
```

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

g. Highest and lowest temperature

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

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

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

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

Exercise 3: Matrix

a. Create matrix

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

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

b. Multiply matrix by 2

```
m2 <- m * 2
m2
```

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

c. Row 2

```
m2[2, ]
```

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

d. Row 1–2, Columns 3–4

```
m2[1:2, 3:4]
```

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

e. Row 3, Columns 2–3

```
m2[3, 2:3]
```

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

f. Column 4 only

```
m2[, 4]
```

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

g. Name rows and columns

```
rownames(m2) <- c("isa", "dalawa", "tatlo")
colnames(m2) <- c("uno", "dos", "tres", "quatro")
m2
```

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

h. Reshape original matrix

```r
dim(m) <- c(6, 2)
m
```

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

Exercise 3: Arrays

a. Create array with repeated values (4 columns, 2 rows, 3 layers)

```r
values <- rep(c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1), times = 2)
arr <- array(values, dim = c(2, 4, 3))
arr
```

```
## , , 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. Number of dimensions

```r
dim(arr)
```

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

c. Name rows, columns, and dimensions

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

arr
```

```
## , , 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
```