```r
#1.a
first_11_letters <- LETTERS[1:11]
first_11_letters
```

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

```r
#1.b
odd_letters <- LETTERS[seq(1, 26, by = 2)]
odd_letters
```

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

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

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

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

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

```r
#1.e
range_15_to_24 <- letters[15:24]
range_15_to_24
```

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

```r
#2.a
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"
```

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

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

```r
#2.c
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
```

```
#2.d
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
```

```
#2.e
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
```

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

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

```
#2.g
highest_temp_city <- city_temp_df[which.max(city_temp_df$Temperature), ]
lowest_temp_city <- city_temp_df[which.min(city_temp_df$Temperature), ]
highest_temp_city
```

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

```
lowest_temp_city
```

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

```
#MATRICES
#2.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
```

```
#2.b
matrix_data_multiplied <- matrix_data * 2
matrix_data_multiplied
```

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

```
#2.c
row_2 <- matrix_data[2, ]
row_2
```

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

```
#2.d
col_3_4_rows_1_2 <- matrix_data[1:2, 3:4]
col_3_4_rows_1_2
```

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

```
#e
col_2_3_row_3 <- matrix_data[3, 2:3]
col_2_3_row_3
```

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

```
#f
col_4 <- matrix_data[, 4]
col_4
```

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

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

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

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

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

```r
#ARRAY

#3.a
array_data <- array(c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1), dim = c(2, 4, 3))
array_data
```

```
## , , 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
```

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

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

```r
#c
dimnames(array_data) <- list(letters[1:2], LETTERS[1:4], c("1st-Dimensional Array", "2nd-Dimensional Ar
array_data
```

```
## , , 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
```