Worksheet_3a

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No. 1

```
## LETTERS

## a.

first_11_letters <- LETTERS[1:11]

first_11_letters
```

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

```
## b.

oddNumbers <- LETTERS[seq(1,length(LETTERS),by =2)]

oddNumbers
```

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

```
## c.

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

vowels
```

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

```
## d.

last5Letters <- letters[22:26]

last5Letters
```

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

```
 ## e.

letters15To24 <- letters[15:24]

letters15To24
```

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

No. 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"
```

```
## b.

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

temp
```

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

```
## c.

cityTemp <- data.frame(City = city, Temp = temp)

cityTemp
```

```
##              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(cityTemp) <- c("City", "Temperatures")

cityTemp
```

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

```
## e.

str(cityTemp)
```

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

```
## f.

cityTemp[3:4,]
```

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

```
## g.

highest_temp <- cityTemp[which.max(cityTemp$Temperature),]

highest_temp
```

```
##              City Temperatures
## 1 Tuguegarao City           42
```

```
lowest_temp <- cityTemp[which.min(cityTemp$Temperature),]


lowest_temp
```

```
##         City Temperatures
## 6 Davao City           27
```

No. 3

```
## a.

matrix1 <- matrix(data = c(1:8,11:14),nrow = 3, ncol = 4)

matrix1
```

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

```
## b.
matrixTimes <- matrix1 * 2

matrixTimes
```

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

```
## c.

matrix1[2,]
```

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

```
## d.

matrix1[1:2,3:4]
```

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

```r
## e.

matrix1[3,2:3]
```

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

```r
## f.
matrix1[,4]
```

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

```r
## g.
rownames(matrixTimes) <- c("isa", "dalawa", "tatlo")

colnames(matrixTimes) <- c("uno", "dos", "tres", "quatro")

matrixTimes
```

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

```r
## h.

dim(matrix1) <- c(6,2)

matrix1
```

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

No. 4

```r
## a.
arrayVal <- c(1:3,6:9,0,3:5,1)

val_repeat <- rep(arrayVal, times = 2)

arrayData <- array(val_repeat,dim = c(2,4,3))

arrayData
```

```
## , , 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.
dim(arrayData)
```

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

```
## The array has 3 dimensions
```

```
## c.
dimnames(arrayData) <- list(
  c("a", "b"),
  c("A", "B", "C", "D"),
  c("1st-Dimensional Array", "2nd-Dimensional Array", "3rd-Dimensional Array")
)

arrayData
```

```
## , , 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
```