Worksheet 3a

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1)

a.

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

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

b.

```
letters[1:26 %% 2!= 0]
```

```
##  [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.

```
letters[21:26]
```

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

e.

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

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

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.

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

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

  c.

```
names(temperature) <- city
temperature
```

```
## Tuguegarao City          Manila     Iloilo City        Tacloban     Samal Island
##             42              39              34              34              30
##      Davao City
##             27
```

  e.

```
temperature[5:6]
```

```
## Samal Island   Davao City
##           30           27
```

2)Matrices a.

```
m2 <- matrix(data = c(1:8,11:14),3,4)
m2
```

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

  b.

```
m2*2
```

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

  c.

```
m2[2,]
```

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

   d.

```
m2[c(1,2),c(3,4)]
```

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

   e.

```
m2[c(3),c(2,3)]
```

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

   f.

```
m2[,4]
```

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

   g.

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

```
##        uno dos tres quatro
## isa      1   4    7     12
## dalawa   2   5    8     13
## tatlo    3   6   11     14
```

   h.

```
dim(m2) <- c(6,2)
m2
```

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

3)Arrays a.

```r
arr <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)
arr
```

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

b.

```r
value <- array(rep(arr, 2), dim = c(2,4,3))
value
```

```
## , , 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
```

c.

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

```
## , , 1st-Dimensional Array
##
##   A B C D
## a 1 3 7 9
## b 2 6 8 0
##
## , , 2nd-Dimentional 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
```