VECTORS No.1

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

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

```
odd_letters <- LETTERS[seq(1,25,2)]
odd_letters
```

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

```
vowel<-c(letters[which(letters %in% c("a","e","i","o","u"))], LETTERS[which(LETTERS %in% c("A","E","I",
vowel
```

```
##  [1] "a" "e" "i" "o" "u" "A" "E" "I" "O" "U"
```

```
last5<- tail(letters, 5)
last5
```

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

```
between<-letters[15:24]
between
```

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

No.2

```
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"
```

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

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

```
Df<-data.frame(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
```

```
names(Df) <- c("City","Temparature")
Df
```

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

```r
str(Df)
```

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

```r
Df[3:4,]
```

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

```r
highestTempCity <- Df$City[which.max(Df$Temparature)]
highestTempCity
```

```
## [1] "Tuguegarao City"
```

```r
lowestTempCity <- Df$City[which.min(Df$Temparature)]
lowestTempCity
```

```
## [1] "Davao City"
```

```r
m1 <- matrix(c(1:8,11:14),ncol=4,nrow=3)
m1
```

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

```r
matrix(c(1:8,11:14),ncol=4,nrow=3) * 2
```

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

```r
matrix(c(1:8,11:14),ncol=4,nrow=3)[2,]
```

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

```r
matrix(c(1:8,11:14),ncol=4,nrow=3)[1:2,c(3,4)]
```

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

```r
matrix(c(1:8,11:14),ncol=4,nrow=3)[3,c(2,3)]
```

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

```r
matrix(c(1:8,11:14),ncol=4,nrow=3)[,4]
```

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

```r
m2 <- matrix(c(1:8,11:14)*2,ncol=4,nrow=3)
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
```

```
dim(m1) <- c(6,2)
m1
```

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

No.3 Arrays

```
numbers <- c(1, 2, 3, 6, 7, 8, 9, 0, 3, 4, 5, 1)
array_ThreeD <- array(numbers, dim = c(2, 4, 3))
numbers
```

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

```
array_ThreeD
```

```
## , , 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
```

```
#the array has threee dimensions
```

```
dimnames(array_ThreeD) <- list(c("a", "b"), LETTERS[1:4], c("1st-Dimensional Array", "2nd-Dimensional A
array_ThreeD
```

```
## , , 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
```