HW 1 - Sagar Thapar

1. Define a numeric vector x of length 0, and show that its length is 0; add value 2, 3, 4, 5 to this vector; add names to each elements of this vector; make this vector a 22 matrix called matx as shown below (byrow option);

Answer:

```
x = c(0);x

## [1] 0

length(x);

## [1] 1

x = c(a=2,b=3,c=4,d=5);x

## a b c d
## 2 3 4 5

matx=matrix(x,nrow=2,byrow=TRUE);matx

##      [,1] [,2]
## [1,]    2    3
## [2,]    4    5
```

2. Define a character vector y of length 4 with letters b-e (try ?letters); make a list li with two elements, one is y, the other is the matrix generated above.

Answer:

```
y=c("b","c","d","e");y

## [1] "b" "c" "d" "e"

length(y);

## [1] 4

li=list(y,x);li

## [[1]]
## [1] "b" "c" "d" "e"
##
## [[2]]
## a b c d
## 2 3 4 5
```

3. Make a data frame df_1 consist of x and y defined above

Answer:

```
df_1=data.frame(x,y);df_1
```

```
##   x y
## a 2 b
## b 3 c
## c 4 d
## d 5 e
```

4. Generate a matrix mats from matx as the follows

Answer:

```
mats = matx[,rep(1:2, c(3,3))];mats
```

```
##      [,1] [,2] [,3] [,4] [,5] [,6]
## [1,]    2    2    2    3    3    3
## [2,]    4    4    4    5    5    5
```

5. Explain what happens to the following (comments after each line in Rnw file), and possibly why if there is an error or warning.

```
matx[2,2] = '5'; matx
```

```
##      [,1] [,2]
## [1,] "2"  "3"
## [2,] "4"  "5"
```

```
df_1[1,2] = 'c'; df_1
```

```
##   x y
## a 2 c
## b 3 c
## c 4 d
## d 5 e
```

```
df_1[1,2] = 'f'; df_1
```

```
## Warning in `[<-.factor`(`*tmp*`, iseq, value = "f"): invalid factor level,
## NA generated
```

```
##   x    y
## a 2 <NA>
## b 3    c
## c 4    d
## d 5    e
```

```
df_1$treat = x>3; df_1
```

```
##   x    y treat
## a 2 <NA> FALSE
## b 3    c FALSE
```

```
## c 4    d  TRUE
## d 5    e  TRUE

df_1$y = as.integer(df_1$y); df_1

##   x  y treat
## a 2 NA FALSE
## b 3  2 FALSE
## c 4  3  TRUE
## d 5  4  TRUE
```

Answer:

df_1[1,2] = 'f'; df_1

This gives the invalid factor level, NA generated error. This is a common factor vs character problem. In R the default data.frame tries to convert the character into a factor.