Foundations of Data Analytics Lab 4a
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CODE:

```
# Lab 3
# L7+L8
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# 20BRS1193

# LAB 4 FDA Lab Experiment-4-a

# 1. Create a list to maintain the details of a student such as
# registration number, name, no. of courses registered and marks in
# each subject.
regno <- c("101", "102", "103")
names <- c("john", "mary", "steve")
courses <- c(3,3,3)
m1 <- c(78,89,98)
m2 <- c(87,99,92)
m3 <- c(88,70,94)

list1 <- list(regno = regno, names = names, courses = courses, m1 =
m1, m2 = m2, m3 = m3)

# 2. Retrieve the name of the students.
list1$names

# 3. Extract only the registration number and the marks of the
students.
list2 <- list(list1$regno, list1$m1, list1$m2, list1$m3)
list2
# 4. Access the mark in the first course registered.
list1$m1

# 5. Modify the mark entry in the last course as 5 more than the
existing mark.
```

```
list1$m3
list1$m3 <- list1$m3 + 5
list1$m3


# Q. A college has conducted technical events for the students.
# It maintains the name of the  participant and the score obtained
# in different events.

# 1. Create a data frame by considering 5 students and 4 events.
# Each event has a maximum score of 10. If a student participates in
# an event, its entry contains the score value and 0 otherwise.

df <- data.frame(e1 = c(4,7,9,0,4), e2 = c(8,4,8,2,8), e3 =
c(0,0,3,10,4), e4 = c(9,4,2,0,2))
names <- c("John", "Jake", "Harry", "Tom", "Joe")
row.names(df) <- names

# 2. View the contents of the data frame.
df

# 3. Find the total score of each participant.
rowSums(df)

# 4. Append a column to include the total score of the participants and
view the data frame.
df$total <- rowSums(df)
df

# 5. Find the maximum score and display the name of the participant
who scored it.
which.max(df$total)

# 6. Compute the average score of each events and append it as a new
row in the data frame.
df[nrow(df) + 1,] <- c(colSums(df)/nrow(df))
names <- c("John", "Jake", "Harry", "Tom", "Joe", "Average")
```

```
row.names(df) <- names
df

# 7. Store the details in a comma separated values (csv) file. Also
suppress the row numbers.
write.csv(df, "events.csv", row.names = FALSE)

# 8. Read the content of â□□Events.csvâ□□ in a data frame and
view it.
df1 = read.csv("events.csv")

# 9. Access the scores of participants in event2 using the column
name.
df1$e2

# 10. Use index number to retrieve the same data.
df1[[2]]

# 11. Extract the score of third participant in event3.
df1
df1$e3[3]

# 12. Extract the scores of the first and second participant in all the
events.
df[c(1,2),]
df[1:2,]

# 13. Display the names and total scores of all participants.
df[,"total", drop=FALSE]

# 14. Make the column a name as the row index of the data frame.
names <- c("John", "Harry", "Jake", "Tom", "Joe", "Average")
row.names(df) <- names
df

# 15. Display the names of the students participated in event3.
e3students <- subset(df, e3>0)
```

```
row.names(e3students)

# 16. Obtain the names whose total score is above its average.
winners <- subset(df, total > df[6,5])
row.names(winners)
```

OUTPUT:

```
> # 1. Create a list to maintain the details of a student such as
> # registration number, name, no. of courses registered and
marks in
> # each subject.

> regno <- c("101", "102", "103")
> names <- c("john", "mary", "steve")
> courses <- c(3,3,3)
> m1 <- c(78,89,98)
> m2 <- c(87,99,92)
> m3 <- c(88,70,94)
> list1 <- list(regno = regno, names = names, courses = courses, m1 =
m1, m2 = m2, m3 = m3)

> # 2. Retrieve the name of the students.
> list1$names
[1] "john"  "mary"  "steve"

> # 3. Extract only the registration number and the marks of the
students.
> list2 <- list(list1$regno, list1$m1, list1$m2, list1$m3)
> list2
[[1]]
[1] "101" "102" "103"

[[2]]
[1] 78 89 98
```

```
[[3]]
[1] 87 99 92

[[4]]
[1] 88 70 94
```

> # 4. Access the mark in the first course registered.

```
> list1$m1
[1] 78 89 98
```

> # 5. Modify the mark entry in the last course as 5 more than the existing mark.

```
> list1$m3
[1] 88 70 94
> list1$m3 <- list1$m3 + 5
> list1$m3
[1] 93 75 99
```

Q1

```
> df <- data.frame(e1 = c(4,7,9,0,4), e2 = c(8,4,8,2,8), e3 =
c(0,0,3,10,4), e4 = c(9,4,2,0,2))
> names <- c("John", "Jake", "Harry", "Tom", "Joe")
> row.names(df) <- names
```

> # 2. View the contents of the data frame.

```
> df
      e1 e2 e3 e4
John   4  8  0  9
Jake   7  4  0  4
Harry  9  8  3  2
Tom    0  2 10  0
Joe    4  8  4  2
```

> # 3. Find the total score of each participant.

```
> rowSums(df)
 John  Jake Harry   Tom   Joe
   21    15    22    12    18
```

> # 4. Append a column to include the total score of the participants and view the data frame.

```
> df$total <- rowSums(df)
> df
      e1 e2 e3 e4 total
John   4  8  0  9    21
Jake   7  4  0  4    15
Harry  9  8  3  2    22
Tom    0  2 10  0    12
Joe    4  8  4  2    18
```

> # 5. Find the maximum score and display the name of the participant who scored it.

```
> which.max(df$total)
[1] 3
```

> # 6. Compute the average score of each events and append it as a new row in the data frame.

```
> df[nrow(df) + 1,] <- c(colSums(df)/nrow(df))
> names <- c("John", "Jake", "Harry", "Tom", "Joe", "Average")
> row.names(df) <- names
> df
        e1 e2   e3  e4 total
John    4.0  8  0.0 9.0  21.0
Jake    7.0  4  0.0 4.0  15.0
Harry   9.0  8  3.0 2.0  22.0
Tom     0.0  2 10.0 0.0  12.0
Joe     4.0  8  4.0 2.0  18.0
Average 4.8  6  3.4 3.4  17.6
```

> # 7. Store the details in a comma separated values (csv) file. Also suppress the row numbers.

```
> write.csv(df, "events.csv", row.names = FALSE)
```

> # 8. Read the content of â□□Events.csvâ□□ in a data frame and view it.

```
> df1 = read.csv("events.csv")
```

> # 9. Access the scores of participants in event2 using the column name.

```
> df1$e2
[1] 8 4 8 2 8 6
```

> # 10. Use index number to retrieve the same data.

```
> df1[[2]]
[1] 8 4 8 2 8 6
```

> # 11. Extract the score of third participant in event3.

```
> df1
   e1 e2   e3  e4 total
1 4.0  8  0.0 9.0  21.0
2 7.0  4  0.0 4.0  15.0
3 9.0  8  3.0 2.0  22.0
4 0.0  2 10.0 0.0  12.0
5 4.0  8  4.0 2.0  18.0
6 4.8  6  3.4 3.4  17.6
> df1$e3[3]
[1] 3
```

> # 12. Extract the scores of the first and second participant in all the events.

```
> df[c(1,2),]
     e1 e2 e3 e4 total
John  4  8  0  9    21
Jake  7  4  0  4    15
> df[1:2,]
     e1 e2 e3 e4 total
John  4  8  0  9    21
Jake  7  4  0  4    15
```

> # 13. Display the names and total scores of all participants.

```
> df[,"total", drop=FALSE]
       total
John    21.0
Jake    15.0
```

```
Harry    22.0
Tom      12.0
Joe      18.0
Average  17.6
```

> # 14. Make the column a name as the row index of the data frame.

```
> names <- c("John", "Harry", "Jake", "Tom", "Joe", "Average")
> row.names(df) <- names
> df
        e1 e2   e3  e4 total
John    4.0  8  0.0 9.0  21.0
Harry   7.0  4  0.0 4.0  15.0
Jake    9.0  8  3.0 2.0  22.0
Tom     0.0  2 10.0 0.0  12.0
Joe     4.0  8  4.0 2.0  18.0
Average 4.8  6  3.4 3.4  17.6
```

> # 15. Display the names of the students participated in event3.

```
> e3students <- subset(df, e3>0)
> row.names(e3students)
[1] "Jake"    "Tom"     "Joe"     "Average"
```

> # 16. Obtain the names whose total score is above its average.

```
> winners <- subset(df, total > df[6,5])
> row.names(winners)
[1] "John" "Jake" "Joe"
```