**CME 4403**

**Lab 1 Worksheet - Due Date: 23th October, 17:00**

*Write down answer the space below the question. Please replace the file name with your name before submitting to the SAKAI.*

1. a) Define a variable **name** that contains a person name “John”.

x <- "John"

b) Define a variable **measure** that contains the value 5.7

y <- 5

c) Define a variable **fault** that shows the execution status of a process as TRUE

Z <- 100<1000

1. a) Define a character vector **name\_vector** that contains 5 names: John, Asli, Can, Berk, Cansu.

name\_vector <- c("John", "Asli", "Can", "Berk", "Cansu")

b) Define a numeric vector **num\_vector** that contains 5 integer values: 3, -2, 4, -1, 5.

num\_vector <- c(3, -2, 4, -1, 5)

c) Define a Boolean vector **bool\_vector** that contains: TRUE, FALSE, TRUE, FALSE, TRUE.

bool\_vector <- c(TRUE, FALSE, TRUE, FALSE, TRUE)

d) Define a numeric vector **rand\_num** that contains 30 numbers between 3 and 100 with equal intervals (Hint: use the seq() function).

rand\_num <- c(seq(from=3,to=100,length=30))

1. a) Print **second** and **third** elements of **name\_vector.**

print(name\_vector[2:3])

[1] "Asli" "Can"

b) Print **num\_vector** elements which are bigger than 3.

print(num\_vector[num\_vector > 3])

[1] 4 5

c) Print people names that are indicated as TRUE in **bool\_vector**.

print(name\_vector[bool\_vector])

[1] "John" "Can" "Cansu"

d) Print the summation of **num\_vector** (Hint: use the sum() function).

print(sum(num\_vector))

[1] 9

e) Create a new vector (**pos\_num**) that only contains positive values in **num\_vector**.

pos\_num <- c(num\_vector[num\_vector > 0])

1. a) Create a new list for specifying person data: **person\_list.** The initial list should contain 3 entiries: “John”, 27, “Computer Engineer”.

person\_list <- list("John", 27, "Computer Engineer")

b) Assign the name of each element in **person\_list**: “name”, “age”, “occupation”

names(person\_list) <- c("name", "age", "occupation")

c) Add a new element to the current **person\_list**:name: “salary” value: 5000

person\_list <- c(person\_list, salary = 500)

d) Print the name and salary of this person separately.

print(person\_list[c(1,4)])

$name

[1] "John"

$salary

[1] 500

1. Create a matrix and apply the following operations on:
2. Create a matrix called **weather\_matrix** by using ***seq***command that creates 15 numbers from 5 to 30 with equal intervals. **weather\_matrix** should contain 5 rows and 3 columns, fill the matrix by rows.

weather\_matrix <- matrix(seq(from=5, to=30,length=15),byrow = T,nrow=5)

1. Set the row (day1, day2, day3, day4, day5) and column (s1, s2, s3) names of **weather\_matrix.**

rownames(weather\_matrix) <- c("day1", "day2", "day3", "day4", "day5")

colnames(weather\_matrix) <- c("s1", "s2", "s3")

1. Compute the summation of samples (rowSums) and find which day has the highest amount of temperature.

rowSums(weather\_matrix)

day1 day2 day3 day4 day5

20.35714 36.42857 52.50000 68.57143 84.64286

**Day 5.**

1. Choose day4 and day5 and their s2 and s3 samples, save them in a **subB** object.

subB <- c(weather\_matrix[4:5,2:3])

1. Use built-in data.frame: “mtcars”
2. What are the dimensions of mtcars?

There are 2 dimensions, dimension 1 is for the car id and the second dimension is for its properties.

1. Select the cars from **mtcars** that has 6 or smaller cylinder size, and then assign it to a new object called as **smallc**.

smallc <- mtcars[mtcars[,2] <= 6,]

1. How many cars are in the **smallc** object?

print(nrow(smallc))

**18**

1. What is the average horse power (hp) of all cars in **smallc**?

print(mean(smallc[,4]))

**98.05556**

1. Get the cars that have 5 gears in **smallc**. What are the names of those cars?

print(rownames(smallc[smallc[,10] == 5,]))

**"Porsche 914-2" "Lotus Europa" "Ferrari Dino"**

1. Write a loop block to check which numbers are even / odd within a given vector **inp\_vec** that contains5, 2, 7, 6, 3, 19, 23, 78, 145, 3, 4, 6, 9, 12, 67. Print a message that indicates the number type such as “6 is even” (the number itself and its type: even/odd).

inp\_vector <- c(5, 2, 7, 6, 3, 19, 23, 78, 145, 3, 4, 6, 9, 12, 67)

for (i in inp\_vector) {

if(i %% 2 == 0)

print(paste(i,"is even"))

else

print(paste(i,"is odd"))

}

[1] "5 is odd"

[1] "2 is even"

[1] "7 is odd"

[1] "6 is even"

[1] "3 is odd"

[1] "19 is odd"

[1] "23 is odd"

[1] "78 is even"

[1] "145 is odd"

[1] "3 is odd"

[1] "4 is even"

[1] "6 is even"

[1] "9 is odd"

[1] "12 is even"

[1] "67 is odd"

1. Create 3 vectors: **name** ("Ali","Cenk","Mete"), **age** (26,32,29), **salary** (2700, 3200, 4900). Then combine these vectors in a data.frame (**company**). Find the name of the employee who gets the highest salary in that company by writing a loop structure.

name <- c("Ali","Cenk","Mete")

age <- c(26,32,29)

salary <- c(2700, 3200, 4900)

company <- data.frame(name = name, age = age, sly = salary)

max\_sly <- 0

max\_name <- ""

for (row in 1:nrow(company)) {

for (i in company[row,3]) {

if(max\_sly < i){

max\_sly <- i

max\_name <- company[row,1]

}

}

}

print(max\_name)

[1] "Mete"