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

name <- "John"

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

measure <- 5.7

c) Define a variable **fault** that shows the mutation status of the gene as TRUE

fault <- TRUE

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 <- seq(from=3, to=100, length=30)

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

name\_vector[c(2,3)]

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

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

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

name\_vector[bool\_vector]

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

sum(num\_vector)

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

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

1. a) Create a new list for specifying person data: **person\_list.** The initial list should contain 3 data: “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: 4000

person\_list <- c(person\_list, salary = 4000)

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

person\_list[["name"]]

person\_list[["salary"]]

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 = TRUE, 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)

which.max(rowSums(weather\_matrix))

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

subB <- weather\_matrix[c("day4", "day5"), c("s2", "s3")]

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

dim(mtcars)

[1]32 11

It has 32 car model and 11 variables.

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

smallc <- subset(mtcars, subset = cyl <= 6)

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

length(rownames(smallc))

[1] 18

smallc object has 18 cars.

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

mean(smallc[["hp"]])

[1] 98.05556

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

rownames(smallc[smallc$gear == 5,])

[1] "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\_vec <- c(5, 2, 7, 6, 3, 19, 23, 78, 145, 3, 4, 6, 9, 12, 67)

for(i in inp\_vec) {

if(i %% 2 == 0) {

cat(i, " is even\n")

}

else if (i %% 2 == 1) {

cat(i, " is odd\n")

}

}

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, salary=salary)

highestSal <- 0

highestSalName <- ""

for(i in length(rownames(company))) {

if(company[i, "salary"] > highestSal) {

highestSal <- company[i, "salary"]

highestSalName <- company[i, "name"]

}

}

sprintf("%s gets the highest salary.\n", highestSalName)