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21BDS0059

EXPERIMENT 2

Q1. There is a list of all the elements of nature and Bob wants to check if his guesses are the one of the main elements of nature and makes a code accordingly.

PROGRAM:

```
Elements_of_Nature_df = list(list("Rain", "Wind", "Earth", "Fire"), list("Water", "Air", "Soil", "Heat"))

Elements_of_Nature_df[[2]][[4]]

print("Wind" %in% Elements_of_Nature_df[[1]])

print("Taniya Ahmed 21BDS0059")
```

OUTPUT:

```
> Elements_of_Nature_df = list(list("Rain", "Wind", "Earth", "Fire"), list("Water", "Air", "Soil", "Heat"))
> Elements_of_Nature_df[[2]][[4]]
[1] "Heat"
> print("Wind" %in% Elements_of_Nature_df[[1]])
[1] TRUE
> print("Taniya Ahmed 21BDS0059")
[1] "Taniya Ahmed 21BDS0059"
>
```

Q2. Alice is doing an image processing task and has to rotate an image 90 degrees. She wants to do this operation on a matrix and writes the logic for the same.

PROGRAM:

```
mat = matrix(data = c(1,2,3,4,5,6,7,8,9), nrow = 3, ncol = 3)

temp_matrix = matrix(0, nrow = 3, ncol = 3)


for(i in 1 : nrow(mat)){

 for(j in 1 : ncol(mat)){

   temp_matrix[j, i] = mat[i, j]

 }

}


mat

temp_matrix

print("Taniya Ahmed 21BDS0059")
```

OUTPUT:

```
> mat
     [,1] [,2] [,3]
[1,]    1    4    7
[2,]    2    5    8
[3,]    3    6    9
> temp_matrix
     [,1] [,2] [,3]
[1,]    1    2    3
[2,]    4    5    6
[3,]    7    8    9
> print("Taniya Ahmed 21BDS0059")
[1] "Taniya Ahmed 21BDS0059"
```

Q3. Bob is curious about the number of consonants and vowels he uses in his normal language and so wants to track the number of the same. He makes a data frame to help him calculate the number of consonants and vowels in his speech.

PROGRAM:

```
df = data.frame(alphabet = c("a", "e", "i", "o", "u", "b", "c", "d", "f", "g", "h", "j", "k", "l",
                             "m", "n", "p", "q", "r", "s", "t", "v", "w",
                             "x", "y", "z"),
                vowel = c(TRUE,TRUE,TRUE,TRUE,TRUE, FALSE, FALSE, FALSE, FALSE, FALSE, FALSE,
FALSE, FALSE, FALSE, FALSE, FALSE,
                          FALSE, FALSE, FALSE, FALSE, FALSE, FALSE, FALSE, FALSE, FALSE, FALSE))


str = "hello world"
split_str = strsplit(str, NULL)[[1]]
vowel = 0
consonant = 0


for(i in 1 : length(split_str)){
  char = split_str[i]


  if(char %in% df$alphabet){
    isVowel = df$vowel[df$alphabet == char]


    if(isVowel){
      vowel = vowel + 1
    }
    else{
      consonant = consonant + 1
    }
  }
}
```

```
print(vowel)

print(consonant)

print("Taniya Ahmed 21BDS0059")
```

OUTPUT:

```
> print(vowel)
[1] 3
> print(consonant)
[1] 7
> print("Taniya Ahmed 21BDS0059")
[1] "Taniya Ahmed 21BDS0059"
>
```

Q4. Sahitya is making a new database technology where she is trying to access records in the most efficient way possible. She has already designed the records in a way that they are sorted. She writes the following logic to enable efficient access of a record which is in the form of an array.

PROGRAM:

```
arr = array(c(2, 14, 26, 49, 68, 74, 88, 100))

l = 1

r = length(arr)

search_key = 49


while(l <= r){

 mid = floor((l + r) / 2)


 if(arr[mid] == search_key){

  print(paste(search_key, "is found"))

  break

 } else if(arr[mid] < search_key) {

  l = mid + 1

 } else {

  r = mid - 1

 }

}

print("Taniya Ahmed 21BDS0059")
```

OUTPUT:

```
[1] "49 is found"
> print("Taniya Ahmed 21BDS0059")
[1] "Taniya Ahmed 21BDS0059"
>
```

Q5. Seren has opened a new restaurant has a tibble of the different dishes, his employee chefs and the ratings that have evolved over the course of the restaurant's time. He now wants to pick the two best chefs for an appreciation gesture. He writes code to do this in a faster manner.

PROGRAM:

```
library(dplyr)

library(tibble)


recipe_tbl = tibble(Recipe_name = c("Pasta alfredo", "Fish finger", "Fried Rice", "Manchurian",
"Dumplings"),

        Chef_name = c("Ritick C.", "John Doe", "Polly S.", "Lakshya P.", "Mansingh L."),

        Rating = c(8, 9, 8.7, 9.3, 9.2))


best_chef = recipe_tbl %>% filter(recipe_tbl$Rating > 9) %>% select(Chef_name)


print(best_chef)

print("Taniya Ahmed 21BDS0059")
```

OUTPUT:

```
> print(best_chef)
# A tibble: 2 × 1
  Chef_name
  <chr>
1 Lakshya P.
2 Mansingh L.
> print("Taniya Ahmed 21BDS0059")
[1] "Taniya Ahmed 21BDS0059"
>
```

Q6. A historian is maintaining record of all the wars that have happened in history and eventually forgets which was the first major conflict of the world and therefore writes a program to find out the same.

PROGRAM:

```
war1 = list(
 title = "World War 1",
 start_year = 1914
)

war2 = list(
 title = "World War 2",
 start_year = 1939
)

war3 = list(
 title = "Cold War",
 start_year = 1947
)

wars = list(war1, war2, war3)
print(wars[[1]]$title)

war4 = list(
 title = "Vietnam War",
 start_year = 1955
)

wars = c(wars, list(war4))

print(wars)
```

print("Taniya Ahmed 21BDS0059")

OUTPUT:

```
> print(wars)
[[1]]
[[1]]$title
[1] "World War 1"

[[1]]$start_year
[1] 1914


[[2]]
[[2]]$title
[1] "World War 2"

[[2]]$start_year
[1] 1939


[[3]]
[[3]]$title
[1] "Cold War"

[[3]]$start_year
[1] 1947


[[4]]
[[4]]$title
[1] "Vietnam War"

[[4]]$start_year
[1] 1955


> print("Taniya Ahmed 21BDS0059")
[1] "Taniya Ahmed 21BDS0059"
```