Worksheet-4a in R

Worksheet for R Programming

Instructions:

- Use RStudio or the RStudio Cloud accomplish this worksheet.

- Create folder for this worksheet#4. Inside the folder, create an .Rmd (R Markdown) for this worksheet and saved it as *RWorksheet_lastname#4a.Rmd*
- **Knit to pdf** to render a pdf file.
- On your own *GitHub repository*, push the .Rmd file, as well as the pdf worksheet knitted to the repo you have created before.
- Do not forget to comment your Git repo on our VLE
- Accomplish this worksheet by answering the questions being asked and writing the code manually.

1. The table below shows the data about shoe size and height. Create a data frame.

   a. Describe the data.

   b. Create a subset by males and females with their corresponding shoe size and height. What its result? Show the R scripts.

   c. Find the mean of shoe size and height of the respondents. Write the R scripts and its result.

   d. Is there a relationship between shoe size and height? Why?

Figure 1: Household Data

Factors

A nominal variable is a categorical variable without an implied order. This means that it is impossible to say that *'one is worth more than the other'.* In contrast, ordinal variables do have a natural ordering.

Example:

```
Gender <- c("M","F","F","M")
factor_Gender <- factor(Gender)
factor_Gender
```

```
## [1] M F F M
## Levels: F M
```

2. Construct character vector months to a factor with factor() and assign the result to factor_months_vector. Print out factor_months_vector and assert that R prints out the factor levels below the actual values.

Consider data consisting of the names of months:
"March","April","January","November","January",
"September","October","September","November","August",
"January","November","November","February","May","August",

```
    "July","December","August","August","September","November","February",|
April")
```

3. Then check the **summary()** of the months_vector and factor_months_vector. | Interpret the results of both vectors. Are they both equally useful in this case?

4. Create a vector and factor for the table below.

Direction	Frequency
East	1
West	4
North	3

Note: Apply the factor function with required order of the level.

```
new_order_data <- factor(factor_data,levels = c("East","West","North"))
print(new_order_data)
```

5. Enter the data below in Excel with file name = *import_march.csv*

Students	Strategy 1	Strategy 2	Strategy 3
Male	8	10	8
	4	8	6
	0	6	4
Female	14	4	15
	10	2	12
	6	0	9

Figure 2: Excel Data

a. Import the excel file into the *Environment Pane* using **read.table()** function. Write the code.

b. View the dataset. Write the R scripts and its result.

Using Conditional Statements (IF-ELSE)

6. Full Search

Exhaustive search is a methodology for finding an answer by exploring all possible cases.

When trying to find a desired number in a set of given numbers, the method of finding the corresponding number by checking all elements in the set one by one can be called an exhaustive search. Implement an exhaustive search function that meets the input/output conditions below.

a. Create an R Program that allows the User to randomly select numbers from 1 to 50. Then display the chosen number. If the number is beyond the range of the selected choice, it will have to display a string "The number selected is beyond the range of 1 to 50". If number 20 is inputted by the User, it will have to display "TRUE", otherwise display the input number.

7. Change

At ISATU University's traditional cafeteria, snacks can only be purchased with bills. A long-standing rule at the concession stand is that snacks must be purchased with as few coins as possible. There are three types of bills: 50 pesos, 100 pesos, 200 pesos, 500 pesos, 1000 pesos.

a. Write a function that prints the minimum number of bills that must be paid, given the price of the snack.

Input: Price of snack (a random number divisible by 50) Output: Minimum number of bills needed to purchase a snack.

8. The following is each student's math score for one semester. Based on this, answer the following questions.

Name	Grade1	Grade2	Grade3	Grade4
Annie	85	65	85	100
Thea	65	75	90	90
Steve	75	55	80	85
Hanna	95	75	100	90

a. Create a dataframe from the above table. Write the R codes and its output.

b. Without using the rowMean function, output the average score of students whose average math score over 90 points during the semester. write R code and its output.

Example Output: Annie's average grade this semester is 88.75.

c. Without using the mean function, output as follows for the tests in which the average score was less than 80 out of 4 tests.

Example output: The nth test was difficult.

d. Without using the max function, output as follows for students whose highest score for a semester exceeds 90 points.

Example Output: Annie's highest grade this semester is 95.