RWorksheet_Andica#4a

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2024-10-20

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

```
shoe_size <- c(6.5, 9.0, 8.5, 8.5, 10.5, 7.0, 9.5, 9.0, 13.0, 7.5, 10.5, 8.5, 12.0, 10.5, 13.0, 11.5, 8
height <- c(66.0, 68.0, 64.5, 65.0, 70.0, 64.0, 70.0, 71.0, 72.0, 64.0, 74.5, 67.0, 71.0, 71.0, 77.0, 7
gender <- c('F', 'F', 'F', 'F', 'M', 'F', 'F', 'F', 'M', 'F', 'M', 'F', 'M', 'M', 'M', 'M', 'F', 'F', '

shoe_data <- data.frame(
  Shoe_Size = shoe_size,
  Height = height,
  Gender = gender
)
shoe_data
```

```
##    Shoe_Size Height Gender
## 1        6.5   66.0      F
## 2        9.0   68.0      F
## 3        8.5   64.5      F
## 4        8.5   65.0      F
## 5       10.5   70.0      M
## 6        7.0   64.0      F
## 7        9.5   70.0      F
## 8        9.0   71.0      F
## 9       13.0   72.0      M
## 10       7.5   64.0      F
## 11      10.5   74.5      M
## 12       8.5   67.0      F
## 13      12.0   71.0      M
## 14      10.5   71.0      M
## 15      13.0   77.0      M
## 16      11.5   72.0      M
## 17       8.5   59.0      F
## 18       5.0   62.0      F
## 19      10.0   72.0      M
## 20       6.5   66.0      F
## 21       7.5   64.0      F
## 22       8.5   67.0      M
## 23      10.5   73.0      M
## 24       8.5   69.0      F
## 25      10.5   72.0      M
## 26      11.0   70.0      M
## 27       9.0   69.0      M
## 28      13.0   70.0      M
```

```r
#a. Describe the data
#The output shows a data frame that contains 28 rows that contains data about shoe size, height, gender
```

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

```r
males <- subset(shoe_data, Gender == "M", select = c(Shoe_Size, Height))
males
```

```
##    Shoe_Size Height
## 5       10.5   70.0
## 9       13.0   72.0
## 11      10.5   74.5
## 13      12.0   71.0
## 14      10.5   71.0
## 15      13.0   77.0
## 16      11.5   72.0
## 19      10.0   72.0
## 22       8.5   67.0
## 23      10.5   73.0
## 25      10.5   72.0
## 26      11.0   70.0
## 27       9.0   69.0
## 28      13.0   70.0
```

```r
females <- subset(shoe_data, Gender == "F", select = c(Shoe_Size, Height))
females
```

```
##    Shoe_Size Height
## 1        6.5   66.0
## 2        9.0   68.0
## 3        8.5   64.5
## 4        8.5   65.0
## 6        7.0   64.0
## 7        9.5   70.0
## 8        9.0   71.0
## 10       7.5   64.0
## 12       8.5   67.0
## 17       8.5   59.0
## 18       5.0   62.0
## 20       6.5   66.0
## 21       7.5   64.0
## 24       8.5   69.0
```

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

```r
mean_shoe <- mean(shoe_data$Shoe_Size)
mean_shoe
```

```
## [1] 9.410714
```

```r
mean_height <- mean(shoe_data$Height)
mean_height
```

```
## [1] 68.57143
```

```r
#D. Yes,The data shows a clear relationship between shoe size and height. Individuals with larger shoe
```

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.

```r
months_vector <- c(
  "March", "April", "January", "November", "January", "September",
  "October", "September", "November", "August", "January",
  "November", "November", "February", "May", "August", "July",
  "December", "August", "August", "September", "November",
  "February", "April"
)
factor_months_vector <- factor(months_vector)
factor_months_vector
```

```
##  [1] March     April     January   November  January   September October
##  [8] September November  August    January   November  November  February
## [15] May       August    July      December  August    August    September
## [22] November  February  April
## 11 Levels: April August December February January July March May ... September
```

```r
levels(factor_months_vector)
```

```
##  [1] "April"     "August"    "December"  "February"  "January"   "July"
##  [7] "March"     "May"       "November"  "October"   "September"
```

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?

```r
summary(months_vector)
```

```
##    Length     Class      Mode
##        24 character character
```

```r
summary(factor_months_vector)
```

```
##     April    August  December  February   January      July     March       May
##         2         4         1         2         3         1         1         1
##  November   October September
##         5         1         3
```

```
#The summary of the months_vector data shows the structure about its length, class, and mode.
#The summary of the factor_months_vector shows the frequency of the months appearing in the dataset.
#No, The months_vector provides basic statistics or properties depending on its type, but it's less inf
```

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

```
direction <- c("East", "West", "North")
frequency <- c(1, 4, 3)

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

```
## [1] East  West  North
## Levels: East West North
```

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

```
#A. Import the excel file into the Environment Pane using read.table() function.
#Write the code.
my_csv <- read.table("import_march.csv", header = TRUE, sep = ",")
```

```
#b. View the dataset. Write the R scripts and its result.
print(my_csv)
```

```
##   Students Strategy.1 Strategy.2 Strategy3
## 1     Male          8         10         8
## 2                   4          8         6
## 3                   0          6         4
## 4   Female         14          4        15
## 5                  10          2        12
## 6                   6          0         9
```

6. Full Search

```
#a. Create an R Program that allows the User to randomly select numbers from 1 to 50.
exhaustive_search <- function(user_input){
  if (user_input < 1 | user_input > 50){
    print("The number selected is beyond the range of 1 to 50")
  }else if (user_input == 20){
    print("TRUE")
  }else {
    print(user_input)
  }
}
user_input <- readline(prompt = "Select a number from 1 - 50: ")
```

```
## Select a number from 1 - 50:
```

```
exhaustive_search(user_input)
```

```
## [1] "The number selected is beyond the range of 1 to 50"
```

7. Change

```
min_bills <- function(price){
  bills <- c(1000, 500, 200, 100, 50)
  total_bills <- 0

  for (bill in bills) {
    count <- floor(price / bill)
    price <- price - count * bill
    total_bills <- total_bills + count
  }

  return(total_bills)
}

price <- as.numeric(readline(prompt = "Enter the price of the snack: "))
```

```
## Enter the price of the snack:
```

```
print(paste("Minimum number of bills needed to purchase a snack:", min_bills(price)))
```

```
## [1] "Minimum number of bills needed to purchase a snack: NA"
```

8. Data Frame of Student's Grade

```
name <- c("Annie", "Thea", "Steve", "Hanna")
grade1 <- c(85, 65, 75, 95)
grade2 <- c(65, 75, 55, 75)
grade3 <- c(85, 90, 80, 100)
grade4 <- c(100, 90, 85, 90)

#a. data frame of student grades
student_grade <- data.frame(
  Name = name,
  Grade1 = grade1,
  Grade2 = grade2,
  Grade3 = grade3,
  Grade4 = grade4
)
student_grade
```

```
##    Name Grade1 Grade2 Grade3 Grade4
## 1 Annie     85     65     85    100
## 2  Thea     65     75     90     90
## 3 Steve     75     55     80     85
## 4 Hanna     95     75    100     90
```

```r
#B. Output the average score of student with an average over 90
for (i in 1:4) {
  total <- sum(student_grade[i, 2:5])
  average <- total / 4

  if (average > 90){
    print(paste0(student_grade[i, 1], "'s average grade this semester is ", average))
  }
}
```

```r
#C. output as follows for the tests in which the average score was less than 80 out of 4 tests
for (i in 2:4){
  total <- 0
  for (j in 1:4){
    total <- total + student_grade[j, i]
  }

  average <- total / 4

  if (average < 80){
    print(paste("The", colnames(student_grade[i]), "test was difficult"))
  }
}
```

```
## [1] "The Grade2 test was difficult"
```

```r
#D. Students whose highest score for a semester exceeds 90 points.
for (j in 1:nrow(student_grade)) {
  highest <- student_grade[j, 2]

  for (i in 3:ncol(student_grade)) {
    if (student_grade[j, i] > highest) {
      highest <- student_grade[j, i]
    }
  }

  if (highest > 90){
    print(paste0(student_grade[j, 1], "'s grade this semester is ", highest))
  }
}
```

```
## [1] "Annie's grade this semester is 100"
## [1] "Hanna's grade this semester is 100"
```