RWorksheet_Songaling#4a.Rmd

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2023-10-25

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

  Household_data <- 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,

    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,

    Gender =c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F",
  )
  Household_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
```

```
  #a. Describe the data.
  #It shows the corresponding shoe size along with their height and gender. It also shows that most mal
```

```r
#b. Create a subset by males and females with their corresponding shoe size and height. What its resu

male <- subset(Household_data, Gender == "M", select = c(Shoe_size, Height))
female <- subset(Household_data, Gender == "F", select = c(Shoe_size, Height))

print(male)
```

```
##    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
print(female)
```

```
##    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
```

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

mean_shoesize <- mean(Household_data$Shoe_size)
mean_height <- mean(Household_data$Height)

cat("Mean shoe size:", (mean_shoesize))
```

```
## Mean shoe size: 9.410714
```

```r
cat("Mean height:", (mean_height))
```

```
## Mean height: 68.57143
```

```r
#d. Is there a relationship between shoe size and height? Why?
  #Yes, because the data shows that the taller the height, the bigger the shoe size.
```

```
#Factors
#2. Construct character vector months to a factor with factor() and assign the result to factor_months_

  Months <-c("March","April","January","November","January",
"September","October","September","November","August",
"January","November","November","February","May","August", "July","December","August","August","Septembe

  factor_Months <- factor(Months)
  factor_Months
```

```
##  [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
```

```
#3. Then check the summary() of the months_vector and factor_months_vector. | Interpret the results of
  summary(Months)
```

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

```
  summary(factor_Months)
```

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

```
  #The results display how many the months that put in the  vector and display how many of the same mon

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

  Direction <-c("East", "West", "North")
  Frequency <-c(1,4,3)

factor_direction <- factor(Direction)
factor_direction
```

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

```
factor_freq <- factor(Frequency)
factor_freq
```

```
## [1] 1 4 3
## Levels: 1 3 4
```

```
new_data <- factor(factor_direction,levels = c("East","West","North"))
print(new_data)
```

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

```
new_data2 <- factor(factor_freq,levels = c(1,4,3))
print(new_data2)
```

```
## [1] 1 4 3
## Levels: 1 4 3
```

```
#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.
  Exceldata <- read.csv("import_march.csv")

  #b. View the data set. Write the R scripts and its result.
  Exceldata
```

```
##   Students Strategy.1 Strategy.2 Strategy.3
## 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
```

```
#Using Conditional Statements (IF-ELSE)
#6. Full Search

  #a. Create an R Program that allows the User to randomly select numbers from 1 to 50.Then display the

  user_input <- readline(prompt = "Enter numbers from 1 to 50: ")
```

```
## Enter numbers from 1 to 50:
```

```
  if(user_input>50){
  print("The number is beyond the range of 1 to 50")
}else{
  print("TRUE")
}
```

```
## [1] "TRUE"
```

```
#7 Change

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

minimum_price <- function(price){

  minprice <- price %/% 50
  paste("The minimum no. of bills:", minprice)
}

minimum_price(200)
```

```
## [1] "The minimum no. of bills: 4"
```

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

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

  math_scores <- data.frame(
    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)
  )
  math_scores
```

```
##    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
```

```
  #b. Without using the rowMean function, output the average score of students whose average math score

  math_scores$Average <- (math_scores$Grade1 + math_scores$Grade2 + math_scores$Grade3 + math_scores$Gra

  highgrades <-  math_scores[math_scores$Average > 90, ]

  if(nrow(highgrades)>0){
    print(highgrades$Name,"'s average grade this semester is:",highgrades)
  }else{
    print("There is no student that got 90 average grades")
  }
```

```
## [1] "There is no student that got 90 average grades"
```

```
  #c.  Without using the mean function, output as follows for the tests in which the average score was

   average_scores <- colMeans(math_scores[, -1])

if (average_scores[1] < 80) {
    print("The 1st test was difficult.")
}else if (average_scores[2] < 80) {
    print("The 2nd test was difficult.")
}else if (average_scores[3] < 80) {
    print("The 3rd test was difficult.")
}else if (average_scores[4] < 80) {
    print("The 4th test was difficult.")
}else{
  print("No test that students find it difficult")
}
```

```
## [1] "The 2nd test was difficult."
```

```
   #d. Without using the max function, output as follows for students whose highest score for a semeste

   #Annie

if (math_scores[1,2] > math_scores[1,3] && math_scores[1,2] > math_scores[1,4] && math_scores[1,2] > ma
  anniescore <- math_scores[1,2]
} else if (math_scores[1,3] >math_scores[1,4] && math_scores[1,3] > math_scores[1,5]) {
  anniescore <- math_scores[1,3]
} else if (math_scores[1,4] > math_scores[1,5] && math_scores[1,2] > math_scores[1,5]) {
  anniescore <- math_scores[1,4]
} else {
  anniescore <- math_scores[1,5]
```

```
}


# Thea scores
if (math_scores[2,2] > math_scores[2,3] && math_scores[2,2] >math_scores[2,4] && math_scores[2,2] > mat
  theascore <- math_scores[2,2]
} else if (math_scores[2,3] > math_scores[2,4] &&math_scores[2,3] > math_scores[2,5]) {
  theascore <- math_scores[2,3]
} else if (math_scores[2,4] > math_scores[2,5] && math_scores[2,2] > math_scores[2,5]) {
  theascore <- math_scores[2,4]
} else {
  theascore <-math_scores[2,5]
}

# Steve scores
if (math_scores[3,2] > math_scores[3,3] &&math_scores[3,2] > math_scores[3,4] && math_scores[3,2] >math
  stevescore <- math_scores[3,2]
} else if (math_scores[3,3] > math_scores[3,4] && math_scores[3,3] > math_scores[3,5]) {
 stevescore <- math_scores[2,3]
} else if (math_scores[3,4] > math_scores[3,5] && math_scores[3,2] > math_scores[3,5]) {
  stevescore <- math_scores[3,4]
} else {
  stevescore <- math_scores[3,5]
}

# Hanna scores
if (math_scores[4,2] > math_scores[4,3] && math_scores[4,2] > math_scores[4,4] && math_scores[4,2] > ma
  hannascore <- math_scores[4,2]
} else if (math_scores[4,3] > math_scores[4,4] && math_scores[4,3] > math_scores[4,5]) {
  hannascore <- math_scores[2,3]
} else if (math_scores[4,4] > math_scores[4,5] && math_scores[4,2] > math_scores[4,5]) {
  hannascore <- math_scores[4,4]
} else {
  hannascore <- math_scores[4,5]
}

math_scores$HighestGrades <- c(anniescore, theascore, stevescore, hannascore)


highest90 <-math_scores[math_scores$HighestGrades > 90,]
highest90
```

```
##    Name Grade1 Grade2 Grade3 Grade4 Average HighestGrades
## 1 Annie     85     65     85    100   83.75           100
## 4 Hanna     95     75    100     90   90.00           100
```

```
if (nrow(highest90) > 0) {
  paste(highest90$Name, "'s highest grade this semester is", highest90$HighestGrade)
} else {
  paste("No students have an average math score over 90.")
}
```

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