RWorksheet_Ahumada4a

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

dtaframe <- data.frame (Gender=c("F","F","F","F","M","F","F","F","M","F","M","F","M","M","M","M","F","F
                Shoe_Size=c(6.5,9.0,8.5,8.5,10.5,7.0,9.5,9.0,13.0,7.5,10.5,8.5,12.0,10.5,13.0,11.5,8.5
                Height=c(66.0,68.0,64.5,65.0,70.0,64.0,70.0,71.0,72.0,64.0,74.5,67.0,71.0,71.0,77.0,72

dtaframe
```

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

```
#a. Describe the data.

#The gender, shoe size, and height of each person are all listed in this data set.

#Along with the associated values for each attribute. With only 28 data points, the dataset seems to be
```

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

femalessubset <- dtaframe[dtaframe$Gender == "F", c("Gender", "Shoe_Size", "Height")]
femalessubset
```

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

```r
malessubset <- dtaframe[dtaframe$Gender == "M", c("Gender", "Shoe_Size", "Height")]
malessubset
```

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

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

meanshoesize <- mean(dtaframe$Shoe_Size)
meanheight <- mean(dtaframe$Height)

meanshoesize
```

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

```r
meanheight
```

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

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

# The two are inversely correlated, with the shoe size directly relating to height. Smaller shoe sizes
```

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

months_vector <- c("March","April","January","November","January","September","October","September","No
months_vector
```

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

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

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
```

```r
# The number of observations, class, and mode of the months_vector are displayed in the summary.

# The frequency of each month is shown in the factor_months_vector summary.

#Both are helpful in various situations where the quantity of observations, class, mode, or frequency a

#4.Create a vector and factor for the table
factor_data <- c("East", "West", "North")
factor_frequency <- c(1,4,3)

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

print(new_order_data)
```

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

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

print(getwd())
```

```
## [1] "/cloud/project/RWorksheet4"
```

```r
file.exists("import_march.csv")
```

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

```
imported_table <- read.table(file =  "/cloud/project/RWorksheet4/import_march.csv", header = TRUE, sep =

imported_table
```

```
##   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
```

```
#6.Full Search
randomNum <- readline(prompt = "Enter number from 1 to 50: ")
```

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

```
paste("The number you have chosen is", randomNum)
```

```
## [1] "The number you have chosen is "
```

```
if (randomNum > 50) {
  paste("Must be 1 to 50 numbers only")
} else if (randomNum == 20) {
  paste("TRUE")
} else {
  paste(randomNum)
}
```

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

```
#7.Change

minimum_Bills <- function(price) {

  minBills <- price %/% 50
  paste("The minimum no. of bills:", minBills)
}
minimum_Bills(90)
```

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

```
#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.

names <- 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)

mathScore <- data.frame(
  Name = names,
```

```
  Grade1 = grade1,
  Grade2 = grade2,
  Grade3 = grade3,
  Grade4 = grade4
)
mathScore
```

```
##    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 ov

mathScore$Average <- (mathScore$Grade1 + mathScore$Grade2 + mathScore$Grade3 + mathScore$Grade4) / 4

highscorers <- mathScore[mathScore$Average > 90,]
highscorers
```

```
## [1] Name    Grade1  Grade2  Grade3  Grade4  Average
## <0 rows> (or 0-length row.names)
```

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

```
## [1] "No students have an average math score over 90."
```

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

TestONE <- sum(mathScore$Grade1) / nrow(mathScore)
TestONE
```

```
## [1] 80
```

```
TestTWO  <- sum(mathScore$Grade2) / nrow(mathScore)
TestTWO
```

```
## [1] 67.5
```

```
TestTHREE  <- sum(mathScore$Grade3) / nrow(mathScore)
TestTHREE
```

```
## [1] 88.75
```

```
TestFOUR <- sum(mathScore$Grade4) / nrow(mathScore)
TestFOUR
```

```
## [1] 91.25
```

```
if (TestONE < 80) {
  paste("The 1st test was difficult.")
} else if(TestTWO < 80) {
  paste("The 2nd test was difficult.")
} else if(TestTHREE < 80) {
  paste("The 3rd test was difficult.")
} else if(TestFOUR < 80) {
```

```
  paste("The 4th test was difficult.")
} else {
  paste("No test had an average score less than 80.")
}
```

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

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

# Annie Score
if (mathScore[1,2] > mathScore[1,3] && mathScore[1,2] > mathScore[1,4] && mathScore[1,2] > mathScore[1,5
  annieHighest <- mathScore[1,2]
} else if (mathScore[1,3] > mathScore[1,4] && mathScore[1,3] > mathScore[1,5]) {
  annieHighest <- mathScore[1,3]
} else if (mathScore[1,4] > mathScore[1,5] && mathScore[1,2] > mathScore[1,5]) {
  annieHighest <- mathScore[1,4]
} else {
  annieHighest <- mathScore[1,5]
}
cat("Annie's highest score is:", annieHighest, "\n")
```

```
## Annie's highest score is: 100
```

```
# Thea Score
if (mathScore[2,2] > mathScore[2,3] && mathScore[2,2] > mathScore[2,4] && mathScore[2,2] > mathScore[2,5
  theaHighest <- mathScore[2,2]
} else if (mathScore[2,3] > mathScore[2,4] && mathScore[2,3] > mathScore[2,5]) {
  theaHighest <- mathScore[2,3]
} else if (mathScore[2,4] > mathScore[2,5] && mathScore[2,2] > mathScore[2,5]) {
  theaHighest <- mathScore[2,4]
} else {
  theaHighest <- mathScore[2,5]
}
cat("Thea's highest score is:", theaHighest, "\n")
```

```
## Thea's highest score is: 90
```

```
# Steve Score
if (mathScore[3,2] > mathScore[3,3] && mathScore[3,2] > mathScore[3,4] && mathScore[3,2] > mathScore[3,5
  steveHighest <- mathScore[3,2]
} else if (mathScore[3,3] > mathScore[3,4] && mathScore[3,3] > mathScore[3,5]) {
  steveHighest <- mathScore[2,3]
} else if (mathScore[3,4] > mathScore[3,5] && mathScore[3,2] > mathScore[3,5]) {
  steveHighest <- mathScore[3,4]
} else {
  steveHighest <- mathScore[3,5]
}
cat("Steve's highest score is:", steveHighest, "\n")
```

```
## Steve's highest score is: 85
```

```
# Hanna Score
if (mathScore[4,2] > mathScore[4,3] && mathScore[4,2] > mathScore[4,4] && mathScore[4,2] > mathScore[4,5
  hannaHighest <- mathScore[4,2]
} else if (mathScore[4,3] > mathScore[4,4] && mathScore[4,3] > mathScore[4,5]) {
  hannaHighest <- mathScore[2,3]
} else if (mathScore[4,4] > mathScore[4,5] && mathScore[4,2] > mathScore[4,5]) {
```

```
  hannaHighest <- mathScore[4,4]
} else {
  hannaHighest <- mathScore[4,5]
}
cat("Hannah's highest score is:", hannaHighest, "\n")
```

```
## Hannah's highest score is: 100
```

```
mathScore$HighestGrades <- c(annieHighest, theaHighest, steveHighest, hannaHighest)


check_above90 <- mathScore[mathScore$HighestGrades > 90,]
check_above90
```

```
##    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(check_above90) > 0) {
  paste(check_above90$Name, "'s highest grade this semester is", check_above90$HighestGrade)
} else {
  paste("All average are less than 90")
}
```

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