RWorksheet_Octaviano#4

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2023-10-25

```
# 1. The table below shows the data about shoe size and height. Create a data frame.
Gender <- c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M" , "F", "M", "M", "M", "M", "F", "F",

shoeSize <- 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, 70.0,64.0,70.0,71.0,72.0,64.0,74.5,67.0,71.0,71.0,77.0,72.0,59.0,62



householdData <- data.frame(
  Gender = Gender,
  ShoeSize = shoeSize,
  Height = Height
)
householdData
```

```
##    Gender ShoeSize 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
# The data contains 28 unique data entries on individuals, including gender, shoe size, and height.

#b
males <- householdData[householdData$Gender == "M",]
males
```

```
##    Gender ShoeSize 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
```

```
females <- householdData[householdData$Gender == "F",]
females
```

```
##    Gender ShoeSize 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
```

```
#c
meanOfShoeSize <- mean(householdData$ShoeSize)
meanOfShoeSize
```

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

```
meanOfHeight <- mean(householdData$Height)
meanOfHeight
```

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

```
#d.
# The relationship between the two is that the shoe size is directly proportional to the height. If the
```

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

months_vector <- c("March","April","January","November","January","September","October","September","Nov

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. | Inter-pret 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
#In the summary of months_vector, it shows the number of observations, class, and mode of the vector.
#In the summary of factor_months_vector, it shows the frequency of each month.
#Both are useful in different cases where the number of observations, class, mode, or frequency are nee


# 4. Create a vector and factor for the table below.
factor_data <- c(1,4,3)
new_order_data <- factor(factor_data,levels = c("East","West","North"))
print(new_order_data)
```

```
## [1] <NA> <NA> <NA>
## Levels: East West North
```

```r
# 5. Enter the data below in Excel with file name = import_march.csv
imported_table <- read.table(file = "/cloud/project/RWorksheet#4/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
```

```
###   Using Conditional Statements (IF-ELSE)

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

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

```
#can't knit if there is as.numeric
#randomNum <- as.numeric(randomNum)

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

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

```
if (randomNum > 50) {
  paste("The number selected is beyond the range of 1 to 50")
} else if (randomNum == 20) {
  paste("TRUE")
} else {
  paste(randomNum)
}
```

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

```
# 7. Change
minimumBills <- function(price) {

  minBills <- price %/% 50
  paste("The minimum no. of bills:", minBills)
}
minimumBills(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 q
#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
)

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

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

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

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

```r
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."
```

```r
#c. Without using the mean function, output as follows for the tests in which the average score was les
firstTest <- sum(mathScore$Grade1) / nrow(mathScore)
firstTest
```

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

```r
secondTest <- sum(mathScore$Grade2) / nrow(mathScore)
secondTest
```

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

```r
thirdTest <- sum(mathScore$Grade3) / nrow(mathScore)
thirdTest
```

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

```r
fourthTest <- sum(mathScore$Grade4) / nrow(mathScore)
fourthTest
```

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

```r
if (firstTest < 80) {
  paste("The 1st test was difficult.")
} else if(secondTest < 80) {
  paste("The 2nd test was difficult.")
} else if(thirdTest < 80) {
  paste("The 3rd test was difficult.")
} else if(fourthTest < 80) {
  paste("The 4th test was difficult.")
} else {
  paste("No test had an average score less than 80.")
}
```

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

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

# -annie scores-
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]
```

```
}


# -thea scores-
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]
}

# -steve scores-
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]
}

# -hanna scores-
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]
}

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


above90 <- mathScore[mathScore$HighestGrades > 90,]
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(above90) > 0) {
  paste(above90$Name, "'s highest grade this semester is", above90$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"
```