RWorksheet_Octavio#4a

2023-10-26

```
# 1

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

gender <- c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M" , "F", "M", "M", "M", "M", "F", "F",

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

householdData
```

```
##    ShoeSize 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
# 1.a
# In the data, there are three variables which are the shoe size, height, and gender. There are 28 obse


# 1.b

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

```
##    ShoeSize Height Gender
## 5      10.5   70.0      M
## 9      13.0   72.0      M
## 11     10.5   74.5      M
## 13     12.0   71.0      M
## 14     10.5   71.0      M
## 15     13.0   77.0      M
## 16     11.5   72.0      M
## 19     10.0   72.0      M
## 22      8.5   67.0      M
## 23     10.5   73.0      M
## 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
females <- householdData[householdData$Gender == "F",]
females
```

```
##    ShoeSize 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
## 6       7.0   64.0      F
## 7       9.5   70.0      F
## 8       9.0   71.0      F
## 10      7.5   64.0      F
## 12      8.5   67.0      F
## 17      8.5   59.0      F
## 18      5.0   62.0      F
## 20      6.5   66.0      F
## 21      7.5   64.0      F
## 24      8.5   69.0      F
```

```r
# 1.c

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

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

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

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

```r
# 1.d
# The relationship of the two is that the shoe size is directly proportional to the height. If the heig

#--------------------

# 2
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

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 months.

# Both are useful in different cases where the no. of observations, class, mode, or the frequency is ne

# ------------

# 4

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
```

```
# ------------

# 5
imported_table <- read.table(file =  "/cloud/project/RWorksheet_Octavio#4/import_march.csv", header = TR

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

randomNum <- readline(prompt = "Enter number from 1 to 50: ")
```

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

```
#cant 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

minimumBills <- function(price) {

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

minimumBills(90)
```

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

```r
# ----------

# 8.a

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
)


# 8.b

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)
```

```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
# 8.c

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
# 8.d
# 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"
```