RWorksheet_Salvador#4

2023-10-27

```
#1. The table below shows the data about shoe size and height. Create a data frame.
#a. Describe the data.
shoe_heightData <- data.frame(
ShoeSize = c(6.5,9.0,8.5,8.5,10.5,7.0,9.5,9.0,13.0,7.5,10.5,8.5,12.0,10.5,13.0,11.5,8.5,5.0,10.0,6.5,7.5
Height = c(66.0,68.0,64.5,65.0,70.0,64.0,70.0,71.0,72.0,64.0,74.5,67.0,71.0,71.0,77.0,72.0,59.0,62.0,72
Gender =  c("F","F","F","F","M","F","F","F","M","F","M","F","M","M","M","M","F","F","M","F","F","M","M"
)
shoe_heightData
```

```
##    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
```

```
#Output
# 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

#b. Create a subset by males and females with their corresponding shoe size and height. What its result
Male <- subset(shoe_heightData, Gender == "M")
cat("Male Subset:\n")
```

```
## Male Subset:
```

```
print(Male)
```

```
##    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
```

```
Female <- subset(shoe_heightData, Gender == "F")
cat("\nFemale Subset:\n")
```

```
##
## Female Subset:
```

```
print(Female)
```

```
##    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
```

```
#Result
#Male Subset:
#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
#Female Subset:
# 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

#c.Find the mean of shoe size and height of the respondents. Write the R scripts and its result.
ShoeSize_mean <- mean(shoe_heightData$ShoeSize)
ShoeSize_mean
```

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

```
Height_mean <- mean(shoe_heightData$Height)
Height_mean
```

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

```
#Result:
#> ShoeSize_mean <- mean(shoe_heightData$ShoeSize)
#> ShoeSize_mean
#[1] 9.410714
#> Height_mean <- mean(shoe_heightData$Height)
#> Height_mean
#[1] 68.57143

#d. Is there a relationship between shoe size and height? Why?
#Yes, because sometimes, people who are taller have bigger feet, but it's not always the case.

#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.
#Consider data consisting of the names of months:
#"March","April","January","November","January",
#"September","October","September","November","August",
#"January","November","November","February","May","August",

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

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
## 9 Levels: April August February January March May November ... September
```

```
#Result
# [1] March     April     January   November  January   September October   September November
#[10] August    January   November  November  February  May       August
#Levels: April August February January March May November October September

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

```
##    Length     Class      Mode
##        16 character character
```

```
summary(factor_Months)
```

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

```
#Result:
#summary(Months)
#   Length     Class      Mode
```

```
#       16 character character
#summary(factor_Months)
#    April    August  February   January     March       May  November   October September
#        1         2         1         3         1         1         4         1         2

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

direction_vector <- c("East", "West", "North")
direction_vector
```

```
## [1] "East"  "West"  "North"
```

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

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

```
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/import_march.csv/import_march.csv", header = TRUE,

imported_table
```

```
##   STUDENT 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"
```

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

# 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)
```

```
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."
```

```
# 8.c
```

```r
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]
}
```

```r
# 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
```

```r
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"
```