Rworksheet_Fermano#4a

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, 8.5
Height = c(66.0, 68.0, 64.5, 65.0, 70.0, 64.0, 70.0, 71.0, 72.0, 64.0, 74.2, 67.0, 71.0, 71.0, 77.0, 72
Gender = c("F", "F", "F", "F", "M", "F","F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F", "M"
)
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   74.2      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
```

```
write.csv(Household_data,file = "Shoe_size")
```

```
#1a. Describe the data.

#1b. Create a subset by males and females with their corresponding shoe size and height. What its resul
submale <- subset(Household_data, Gender == "M", select =
c(Shoe_size, Height))
```

```r
subfema <- subset(Household_data, Gender == "F", select =
c(Shoe_size, Height))
```

```r
#1c. Find the mean of shoe size and height of the respondents. Write the R scripts and its result.
meansiz <- mean(Household_data$Shoe_size)
meansiz
```

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

```r
meanhei <- mean(Household_data$Height)
meanhei
```

```
## [1] 68.56071
```

```r
#1d. Is there a relationship between shoe size and height? Why?
```

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

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

```
##  [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_nammonths <- factor(nammonths)
factor_nammonths
```

```
##  [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 bo
summary(factor_nammonths)
```

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

```r
#4 Apply the factor function with required order of the level.new_order_data <- factor(factor_data,leve
Direction <- c("East","West","North")
Frequency <- c(1,4,3)

factdire <- factor(Direction)
factdire
```

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

```r
factfreq <- factor(Frequency)
factfreq
```

```
## [1] 1 4 3
```

```
## Levels: 1 3 4
```

```
new_order_data <- factor(factdire,levels = c("East","West","North"))
print(new_order_data)
```

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

```
new_order_data2 <- factor(factfreq,levels = c(1,4,3))
print(new_order_data2)
```

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

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

#5a. Import the excel file into the Environment Pane using read.table() function. Write the code. (Envi
Excdata <- read.csv("import_march.csv")
```

```
#5b View the dataset. Write the R scripts and its result.
Excdata
```

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

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

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

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

```
#7 Change
minimumprice <- function(price) {

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

minimumprice(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

#8a Create a data frame
```

```r
mathgrades <- 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)
)
mathgrades
```

```
##    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
```

```r
#8b Without using the rowMean function, output the average score of students whose average math score o

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

highgrades <-  mathgrades[mathgrades$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"
```

```r
#8c Without using the mean function, output as follows for the tests in which the averagescore was less

 average_scores <- colMeans(mathgrades[, -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."
```

```r
#8d Without using the max function, output as follows for students whose highest score for a semester e

# Annie

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

```
  anniescore <- mathgrades[1,4]
} else {
  anniescore <- mathgrades[1,5]
}


# Thea scores

if (mathgrades[2,2] > mathgrades[2,3] && mathgrades[2,2] >mathgrades[2,4] && mathgrades[2,2] > mathgrad
  theascore <- mathgrades[2,2]
} else if (mathgrades[2,3] > mathgrades[2,4] &&mathgrades[2,3] > mathgrades[2,5]) {
  theascore <- mathgrades[2,3]
} else if (mathgrades[2,4] > mathgrades[2,5] && mathgrades[2,2] > mathgrades[2,5]) {
  theascore <- mathgrades[2,4]
} else {
  theascore <-mathgrades[2,5]
}

# Steve scores

if (mathgrades[3,2] > mathgrades[3,3] &&mathgrades[3,2] > mathgrades[3,4] && mathgrades[3,2] >mathgrades
  stevescore <- mathgrades[3,2]
} else if (mathgrades[3,3] > mathgrades[3,4] && mathgrades[3,3] > mathgrades[3,5]) {
 stevescore <- mathgrades[2,3]
} else if (mathgrades[3,4] > mathgrades[3,5] && mathgrades[3,2] > mathgrades[3,5]) {
  stevescore <- mathgrades[3,4]
} else {
  stevescore <- mathgrades[3,5]
}

# Hanna scores

if (mathgrades[4,2] > mathgrades[4,3] && mathgrades[4,2] > mathgrades[4,4] && mathgrades[4,2] > mathgra
  hannascore <- mathgrades[4,2]
} else if (mathgrades[4,3] > mathgrades[4,4] && mathgrades[4,3] > mathgrades[4,5]) {
  hannascore <- mathgrades[2,3]
} else if (mathgrades[4,4] > mathgrades[4,5] && mathgrades[4,2] > mathgrades[4,5]) {
  hannascore <- mathgrades[4,4]
} else {
  hannascore <- mathgrades[4,5]
}

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


highest90 <- mathgrades[mathgrades$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"
```