RWorksheet_Sadural#4A

2023-10-25

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

#1a.
  household_data <- data.frame (shoe_size = c(6.5,9.0,8.5,8.5,10.5,7.0,9.5,9.0,13.0,7.5,10.5,8.5,12.0,1(
  height = c(66.0,68.0,64.5,65.0,70.0,64.0,70.0,71.0,72.0,64.0,74.5,67.0,71.0,71.0,77.0,72.0,59.0,62.0,7
  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"
  )

  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   74.5      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   62.0      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
#1b.
male_data <- subset(household_data, Gender == "M", select = c(shoe_size , height))

female_data <- subset(household_data, Gender == "F" , select = c(shoe_size , height))

#1c.
```

```r
mean_sh <- mean(household_data$shoe_size &household_data$height)
mean_sh
```

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

```r
#1d.Is there a relationship between shoe size and height? Why?
# Yes, because if your height is small, then your shoe size is small. And if your height is big then yo


#2.

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

custom_levels <- c("January", "February", "March", "April", "May", "June", "July", "August", "September"

factor_months_vector <- factor(months, levels = custom_levels)

print(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
## 12 Levels: January February March April May June July August ... December
```

```r
#3.
summary(factor_months_vector)
```

```
##   January  February     March     April       May      June      July    August
##         3         2         1         2         1         0         1         4
## September   October  November  December
##         3         1         5         1
```

```r
#4. Create a vector and factor for the table below
Direction <- c("East","West","North")
Frequency <- c(1,4,3)

factor_direct <- factor(Direction)
factor_direct
```

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

```r
factor_freq1 <- factor(Frequency)
factor_freq1
```

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

```r
new_order_data <- factor(factor_direct,levels = c("East","West","North"))

print(new_order_data)
```

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

```r
new_order_data2 <- factor(factor_freq1,levels = c(1,4,3))
print(new_order_data2)
```

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

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

#5a.
Exceldata <- read.csv("import_march.csv")

#5b.
Exceldata
```

```
##    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
```

```r
#6. Full Search
#Exhaustive search is a methodology for finding an answer by exploring all possible cases.When trying t

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

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

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

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

```r
#7.
minimum_price <- function(price) {

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

minimum_price(90)
```

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

```r
#8 Create a data frame
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.

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
 average_scores <- colMeans(mathgrades[, -1])

if (average_scores[1] < 80) {
    print("The 1st test was difficult.\n")
}else if (average_scores[2] < 80) {
    print("The 2nd test was difficult.\n")
}else if (average_scores[3] < 80) {
    print("The 3rd test was difficult.\n")
}else if (average_scores[4] < 80) {
    print("The 4th test was difficult.\n")
}else{
  print("No test that students find it difficult")
}
```

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

```r
#8d
#annie

if (mathgrades[1,2] > mathgrades[1,3] && mathgrades[1,2] > mathgrades[1,4] && mathgrades[1,2] > mathgrad
  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] > mathgrade
  theascore <- mathgrades[2,2]
```

```r
} 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] >mathgrade
  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] > mathgrad
  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
```

```r
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"
```