RWorkSheet#4a

2023-10-25

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

df <- 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, 5.0, 10.0
 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', 'M', 'F', 'F',
)
df
```

```
##    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   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
# b. Create a subset by males and females with their corresponding shoe size and height.
# What its result? Show the R scripts.
df_males <- subset(df, Gender == 'M')
df_females <- subset(df, Gender == 'F')
df_males
```

```
##    Shoe_Size 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
```

```
df_females
```

```
##    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
## 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
# c.Find the mean of shoe size and height of the respondents. Write the R scripts and its result.
mean_shoe_size <- mean(df$Shoe_Size)
mean_height <- mean(df$Height)
paste("The mean shoe size of the respondents is:", mean_shoe_size)
```

```
## [1] "The mean shoe size of the respondents is: 9.41071428571429"
```

```r
paste("The mean height of the respondents is:", mean_height)
```

```
## [1] "The mean height of the respondents is: 68.5714285714286"
```

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


# 2.


# Constructing the character vector months
months_vector <- c("March","April","January","November","January",
                   "September","October","September","November","August",
                   "January","November","November","February","May","August",
                   "July","December","August","August","September","November","February",
                   "April")

# Converting the character vector months to a factor
```

```r
factor_months_vector <- factor(months_vector)

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

direction <- c("East", "West", "North")
frequency <- c(1,4,3)

factor_data <- factor(c(direction,frequency))
factor_data
```

```
## [1] East  West  North 1     4     3
## Levels: 1 3 4 East North West
```
```r
new_order_data <- factor(factor_data,levels = c("East","West","North"))
print(new_order_data)
```

```
## [1] East  West  North <NA>  <NA>  <NA>
## Levels: East West North
```
```r
# 5
read.table(file = "/cloud/project/RWorksheet#4a/import_march.csv", header = TRUE, sep = ",")
```

```
##          X        X.1        X.2        X.3
## 1 Students Strategy 1 Strategy 2 Strategy 3
## 2     Male          8         10          8
## 3                    4          8          6
## 4                    0          6          4
## 5   Female         14          4         15
## 6                   10          2         12
## 7                    6          0          9
```
```r
reading <- read.csv("import_march.csv")
reading
```

```
##           X        X.1        X.2        X.3
```

```
## 1 Students Strategy 1 Strategy 2 Strategy 3
## 2      Male            8           10           8
## 3                      4            8           6
## 4                      0            6           4
## 5    Female           14            4          15
## 6                     10            2          12
## 7                      6            0           9
```

```r
# 6

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

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

```r
#error cannot 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 "
```

```r
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] ""
```

```r
# 7

minimumBills <- function(price) {

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

minimumBills(900)
```

```
## [1] "The minimum no. of bills: 18"
```

```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)

grade <- data.frame(
  Name = names,
  Grade1 = grade1,
  Grade2 = grade2,
  Grade3 = grade3,
  Grade4 = grade4
)
```

```
grade
```

```
##    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
# 8.b

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

highScorers <- grade[grade$Average > 90,]
highScorers
```

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

```r
if (nrow(highScorers) > 0) {
  paste(highScorers$Name, "'s average grade this semester is", highScorers$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(grade$Grade1) / nrow(grade)
firstTest
```

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

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

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

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

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

```r
fourthTest <- sum(grade$Grade4) / nrow(grade)
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."
# 8.d
#ANNIE GRADE
if (grade$Grade1[1] > 90) {
  print(paste(grade$Name[1], "'s highest grade this semester is", grade$Grade1[1], ".", sep = ""))
} else if (grade$Grade2[1] > 90) {
  print(paste(grade$Name[1], "'s highest grade this semester is", grade$Grade2[1], ".", sep = ""))
} else if (grade$Grade3[1] > 90) {
  print(paste(grade$Name[1], "'s highest grade this semester is", grade$Grade3[1], ".", sep = ""))
} else if (grade$Grade4[1] > 90) {
  print(paste(grade$Name[1], "'s highest grade this semester is", grade$Grade4[1], ".", sep = ""))
}
```

```
## [1] "Annie's highest grade this semester is100."
#THEA GRADE
if (grade$Grade1[2] > 90) {
  print(paste(grade$Name[2], "'s highest grade this semester is", grade$Grade1[2], ".", sep = ""))
} else if (grade$Grade2[2] > 90) {
  print(paste(grade$Name[2], "'s highest grade this semester is", grade$Grade2[2], ".", sep = ""))
} else if (grade$Grade3[2] > 90) {
  print(paste(grade$Name[2], "'s highest grade this semester is", grade$Grade3[2], ".", sep = ""))
} else if (grade$Grade4[2] > 90) {
  print(paste(grade$Name[2], "'s highest grade this semester is", grade$Grade4[2], ".", sep = ""))
}

#STEVE GRADE
if (grade$Grade1[3] > 90) {
  print(paste(grade$Name[3], "'s highest grade this semester is", grade$Grade1[3], ".", sep = ""))
} else if (grade$Grade2[3] > 90) {
  print(paste(grade$Name[3], "'s highest grade this semester is", grade$Grade2[3], ".", sep = ""))
} else if (grade$Grade3[3] > 90) {
  print(paste(grade$Name[3], "'s highest grade this semester is", grade$Grade3[3], ".", sep = ""))
} else if (grade$Grade4[3] > 90) {
  print(paste(grade$Name[3], "'s highest grade this semester is", grade$Grade4[3], ".", sep = ""))
}

#HANNA GRADE
if (grade$Grade1[4] > 100) {
  print(paste(grade$Name[4], "'s highest grade this semester is", grade$Grade1[4], ".", sep = ""))
} else if (grade$Grade2[4] >= 100) {
  print(paste(grade$Name[4], "'s highest grade this semester is", grade$Grade2[4], ".", sep = ""))
} else if (grade$Grade3[4] >= 100) {
  print(paste(grade$Name[4], "'s highest grade this semester is", grade$Grade3[4], ".", sep = ""))
} else if (grade$Grade4[4] >= 100) {
  print(paste(grade$Name[4], "'s highest grade this semester is", grade$Grade4[4], ".", sep = ""))
}
```

```
## [1] "Hanna's highest grade this semester is100."
```