# RWorksheet_Gallenero#4a

2023-10-25

```
#1. Create a data frame
df_shoe <- 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, 6.5,
                             7.5, 8.5, 10.5, 8.5,10.5, 11.0, 9.0, 13.0),
                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, 62.0, 72.0,66.0, 64.0,
                         67.0,73.0, 69.0, 72.0, 70.0,69.0, 70.0),
                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",
                           "F", "M", "M", "M","M"))
df_shoe
```

```
##    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
```

```
#a.
# This data set includes information about each person's # height, shoe size, and gender.
```

```r
#b.
female_subset <- df_shoe[df_shoe$Gender == "F", c("Gender", "Shoe_Size", "Height")]
female_subset
```

```
##    Gender Shoe_Size Height
## 1       F       6.5   66.0
## 2       F       9.0   68.0
## 3       F       8.5   64.5
## 4       F       8.5   65.0
## 6       F       7.0   64.0
## 7       F       9.5   70.0
## 8       F       9.0   71.0
## 10      F       7.5   64.0
## 12      F       8.5   67.0
## 17      F       8.5   59.0
## 18      F       5.0   62.0
## 20      F       6.5   66.0
## 21      F       7.5   64.0
## 24      F       8.5   69.0
```

```r
male_subset <- df_shoe[df_shoe$Gender == "M", c("Gender", "Shoe_Size", "Height")]
male_subset
```

```
##    Gender Shoe_Size Height
## 5       M      10.5   70.0
## 9       M      13.0   72.0
## 11      M      10.5   74.5
## 13      M      12.0   71.0
## 14      M      10.5   71.0
## 15      M      13.0   77.0
## 16      M      11.5   72.0
## 19      M      10.0   72.0
## 22      M       8.5   67.0
## 23      M      10.5   73.0
## 25      M      10.5   72.0
## 26      M      11.0   70.0
## 27      M       9.0   69.0
## 28      M      13.0   70.0
```

```r
# c.
mean_shoesize <- mean(df_shoe$Shoe_Size)
mean_shoesize
```

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

```r
mean_height <- mean(df_shoe$Height)
mean_height
```

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

```r
# d.
# The relationship between the two is that height and shoe size are directly proportional. A short heig

#2. Constructing the character vector months

months_vector <-c("March","April","January","November","January", "September", "October", "September",
```

```r
# Converting the character vector months to a factor
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
#4

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

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

```r
Frequency <- c (1,4,3)
Frequency
```

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

```r
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
import_table <- read.table(file =  "/cloud/project/worksheet#4/import_march.csv", header = TRUE, sep =

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

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

```
#cant knit if there is as.numeric
#random_num <- as.numeric(random_num)

paste("The number you have chosen is", random_num)
```

```
## [1] "The number you have chosen is "
```

```
if (random_num > 50) {
  paste("The number selected is beyond the range of 1 to 50")
} else if (random_num == 20) {
  paste("TRUE")
} else {
  paste(random_num)
}
```

```
## [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

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

first_test <- sum(grade$Grade1) / nrow(grade)
first_test
```

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

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

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

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

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

```r
fourth_test <- sum(grade$Grade4) / nrow(grade)
fourth_test
```

```
## [1] 91.25
```

```r
if (first_test < 80) {
  paste("The 1st test was difficult.")
} else if(second_test < 80) {
  paste("The 2nd test was difficult.")
} else if(third_test < 80) {
  paste("The 3rd test was difficult.")
} else if(fourth_test < 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
# Annie
if (grade[1,2] > grade[1,3] && grade[1,2] > grade[1,4] && grade[1,2] > grade[1,5]) {
  annieHighest <- grade[1,2]
} else if (grade[1,3] > grade[1,4] && grade[1,3] > grade[1,5]) {
  annieHighest <- grade[1,3]
```

```
} else if (grade[1,4] > grade[1,5] && grade[1,2] > grade[1,5]) {
  annieHighest <- grade[1,4]
} else {
  annieHighest <- grade[1,5]
}


# Thea
if (grade[2,2] > grade[2,3] && grade[2,2] > grade[2,4] && grade[2,2] > grade[2,5]) {
  theaHighest <- grade[2,2]
} else if (grade[2,3] > grade[2,4] && grade[2,3] > grade[2,5]) {
  theaHighest <- grade[2,3]
} else if (grade[2,4] > grade[2,5] && grade[2,2] > grade[2,5]) {
  theaHighest <- grade[2,4]
} else {
  theaHighest <- grade[2,5]
}
# Steve
if (grade[3,2] > grade[3,3] && grade[3,2] >grade[3,4] && grade[3,2] > grade[3,5]) {
  steveHighest <- grade[3,2]
} else if (grade[3,3] > grade[3,4] && grade[3,3] >grade[3,5]) {
  steveHighest <- grade[2,3]
} else if (grade[3,4] > grade[3,5] && grade[3,2] > grade[3,5]) {
  steveHighest <- grade[3,4]
} else {
  steveHighest <- grade[3,5]
}

# Hanna
if (grade[4,2] > grade[4,3] && grade[4,2] > grade[4,4] && grade[4,2] > grade[4,5]) {
  hannaHighest <- grade[4,2]
} else if (grade[4,3] > grade[4,4] && grade[4,3] > grade[4,5]) {
  hannaHighest <- grade[2,3]
} else if (grade[4,4] > grade[4,5] && grade[4,2] > grade[4,5]) {
  hannaHighest <- grade[4,4]
} else {
  hannaHighest <- grade[4,5]
}

grade$HighestGrades <- c(annieHighest, theaHighest, steveHighest, hannaHighest)


above90 <- grade[grade$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"
```