RMarkdown_Somosera#4

2023-10-25

```
HouseholdData <- 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, 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")
)

#a. Describe the data
#The data frame contains information on individuals' shoe sizes, heights, and genders.
```

```
#b.Subsets for Male and Female
SubM <- HouseholdData[HouseholdData$Gender == "M", c("ShoeSize", "Height")]

SubF <- HouseholdData[HouseholdData$Gender == "F", c("ShoeSize", "Height")]

SubM
```

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

```
SubF
```

```
##    ShoeSize Height
## 1       6.5   66.0
## 2       9.0   68.0
## 3       8.5   64.5
## 4       8.5   65.0
## 6       7.0   64.0
## 7       9.5   70.0
## 8       9.0   71.0
## 10      7.5   64.0
## 12      8.5   67.0
```

```
## 17      8.5   59.0
## 18      5.0   62.0
## 20      6.5   66.0
## 21      7.5   64.0
## 24      8.5   69.0
```

```
#c. Mean of Height and Shoe Sizes
MeanSS<- mean(HouseholdData$ShoeSize)
MeanH<- mean(HouseholdData$Height)

MeanSS
```

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

```
MeanH
```

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

```
#d. Is there a relationship between shoe size and height? Why?
#Yes, there is a relationship between the shoe size and height since it can be
#observed that taller people often have a larger shoe sizes.
```

```
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")

factor_months_vector<- factor(months_vector)
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
## 11 Levels: April August December February January July March May ... September
```

```
summary(months_vector)
```

```
##    Length     Class      Mode
##        24 character character
```

```
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
```

```
#The first summary provided the information about the  length, class, and mode.
#It shows that the vector consists of 24 character elements.
#On the other hand, the second summary provided the count on how many times each month appears
#in the original data. Overall, both summary are useful as they provided the length of the data as well
```

```
Direction <- c("East", "West", "North")
Frequency <- c(1, 4, 3)
factor_data<-c(Direction, Frequency)
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
```

```
#a. Import the excel file into the Environment Pane using read.table() function.
ExcelData<- read.table("/cloud/project/Worksheet#4/import_march.csv", header = TRUE, sep = ",")
```

```
randomnum <- sample(1:50, 1)

cat("The chosen number is:", randomnum, "\n")
```

```
## The chosen number is: 46
```

```
if (randomnum == 20) {
  cat("TRUE\n")
} else if (randomnum < 1 || randomnum> 50) {
  cat("The number selected is beyond the range of 1 to 50\n")
} else {
  cat(randomnum, "\n")
}
```

```
## 46
```

```
minbills <- function(snackprice) {
  billtype <- c(1000, 500, 200, 100, 50)
  totalbill <- 0

  for (bill in billtype) {
    billpaid <- snackprice %/% bill
    snackprice <- snackprice %% bill
    total <- totalbill + billpaid
  }

  cat("Minimum number of bills needed to purchase the snack:", total, "\n")
}

snackprice <- 1350
minbills(snackprice)
```

```
## Minimum number of bills needed to purchase the snack: 1
```

```
#8.
#a.
students <- 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)
)
students
```

```
##    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
#b.

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

for (i in 1:nrow(students)) {
  if (students$Average[i] > 90) {
    cat(students$Name[i], "'s average grade this semester is", students$Average[i], "\n")
  }
}
```

```r
#c
AvTest1 <- sum(students$Grade1) / nrow(students)
AvTest2 <- sum(students$Grade2) / nrow(students)
AvTest3 <- sum(students$Grade3) / nrow(students)
AvTest4 <- sum(students$Grade4) / nrow(students)

if (AvTest1 < 80) {
  cat("The 1st test was difficult.\n")
}
if (AvTest2 < 80) {
  cat("The 2nd test was difficult.\n")
}
```

```
## The 2nd test was difficult.
```

```r
if (AvTest3 < 80) {
  cat("The 3rd test was difficult.\n")
}
if (AvTest4 < 80) {
  cat("The 4th test was difficult.\n")
}
```

```r
#d.
for (i in 1:nrow(students)) {
  highest_grade <- students$Grade1[i]
  if (students$Grade2[i] > highest_grade) {
    highest_grade <- students$Grade2[i]
  }
  if (students$Grade3[i] > highest_grade) {
    highest_grade <- students$Grade3[i]
  }
  if (students$Grade4[i] > highest_grade) {
    highest_grade <- students$Grade4[i]
  }
  if (highest_grade > 90) {
    cat(students$Name[i], "'s highest grade this semester is", highest_grade, "\n")
  }
}
```

```
## Annie 's highest grade this semester is 100
## Hanna 's highest grade this semester is 100
```