RWorksheet_Sorenio#4a.Rmd

2024-10-14

```
# 1
shoedata <- data.frame(
  ShoeSize = c(6.5, 9.0, 8.5, 8.5, 10.5, 7.0, 9.0, 9.0, 7.5, 10.5, 8.5, 10.5, 10.5, 8.5, 10.5, 13.0, 11
  Height = c(66.0, 68.0, 64.5, 65.0, 72.0, 64.0, 71.0, 71.0, 64.0, 74.5, 67.0, 71.0, 77.0, 72.0, 59.0, 
  Gender = c("F", "F", "F", "F", "F", "M", "M", "M", "F", "F", "M", "M", "M", "M", "M", "M", "M", "M", 
)

shoedata
```

```
##    ShoeSize 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   72.0      F
## 6       7.0   64.0      M
## 7       9.0   71.0      M
## 8       9.0   71.0      M
## 9       7.5   64.0      F
## 10     10.5   74.5      F
## 11      8.5   67.0      M
## 12     10.5   71.0      M
## 13     10.5   77.0      M
## 14      8.5   72.0      M
## 15     10.5   59.0      M
## 16     13.0   72.0      M
## 17     11.5   72.0      M
## 18      8.5   77.0      M
## 19      7.0   66.0      M
## 20      6.5   73.0      M
## 21      8.5   67.0      M
## 22      9.0   67.0      M
## 23      8.5   69.0      M
## 24     11.0   71.0      M
## 25     13.0   70.0      M
```

a. Describe the data.

The data includes shoe size, height, and gender for 25 people. Shoe sizes range from 6.5 to 13, heights from 59 to 77 inches, with 9 females and 16 males. It helps to explore averages and any link between height and shoe size.

b

```
MALE <- subset(shoedata, Gender == "M")

FEMALE <- subset(shoedata, Gender == "F")

print("Male Data:")
```

```
## [1] "Male Data:"
```

```
print(MALE)
```

```
##    ShoeSize Height Gender
## 6       7.0     64      M
## 7       9.0     71      M
## 8       9.0     71      M
## 11      8.5     67      M
## 12     10.5     71      M
## 13     10.5     77      M
## 14      8.5     72      M
## 15     10.5     59      M
## 16     13.0     72      M
## 17     11.5     72      M
## 18      8.5     77      M
## 19      7.0     66      M
## 20      6.5     73      M
## 21      8.5     67      M
## 22      9.0     67      M
## 23      8.5     69      M
## 24     11.0     71      M
## 25     13.0     70      M
```

```
print("Female Data:")
```

```
## [1] "Female Data:"
```

```
print(FEMALE)
```

```
##    ShoeSize 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   72.0      F
## 9       7.5   64.0      F
## 10     10.5   74.5      F
```

c

```
MEANSHOE <- mean(shoedata$ShoeSize)

MEANH <- mean(shoedata$Height)

print(paste("Mean Shoe Size:", MEANSHOE))
```

```
## [1] "Mean Shoe Size: 9.24"
```

```
print(paste("Mean Height:", MEANH))
```

```
## [1] "Mean Height: 69.2"
```

d

```
relation <- cor(shoedata$ShoeSize, shoedata$Height)

print(paste("Correlation between Shoe Size and Height:", relation))
```

```
## [1] "Correlation between Shoe Size and Height: 0.329955828841829"
```

```
# 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", "April"
)

factor_months_vector <- factor(MONTHS)

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
```

```r
# 3
print("Summary of months_vector (character vector):")
```

```
## [1] "Summary of months_vector (character vector):"
```

```r
summary(MONTHS)
```

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

```r
print("Summary of factor_months_vector:")
```

```
## [1] "Summary of factor_months_vector:"
```

```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
# The character vector just tells us the total number of months in the data, but it doesn't show how ma
```

```r
# 4

direction_data <- c("East", "West", "North")

frequency_data <- c(1, 4, 3)

new_order_data <- factor(direction_data, levels = c("East", "West", "North"))

print(new_order_data)
```

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

```r
# 5
# a
exceldata <- read.table("import_march.csv", header = TRUE, sep = ",")

View(exceldata)

# b
print(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
View(exceldata)
```

```r
# 6. a
 randsearch <- function() {

  rnumber <- readline(prompt="Enter a random number between 1 and 50:")
  if (rnumber < 1 || rnumber > 50) {
    print("The number selected is beyond the range of 1 to 50")
  } else if (rnumber == 20) {
    return("TRUE")
  } else {
    print(paste("The selected number is", rnumber))
  }
}

randsearch()
```

```
## Enter a random number between 1 and 50:
## [1] "The number selected is beyond the range of 1 to 50"
```

```r
# 7. a
minimumbills <- function (price){
  Bills <- c(50, 100, 200, 500, 1000)
  count <- 0
  for (bill in Bills){
    count <- count + price %% bill
    price <- price %% bill
  }
  return(count)
}

sprice <- as.integer(readline(prompt= "Enter the price of the snack: "))
```

```
## Enter the price of the snack:
```

```r
print(paste("Minimum number of bills needed: ", minimumbills(sprice)))
```

```
## [1] "Minimum number of bills needed:  NA"
```

```r
# 8. a
 Grades <- 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)
   )

Grades
```

```
##    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
for (i in 1:nrow(Grades)) {
  studs <- Grades[i, ]
  average <- (studs$Grade1 + studs$Grade2 + studs$Grade3 + studs$Grade4) / 4

  cat(studs$Name, "'s average grade this semester is", average, "\n")
}
```

```
## Annie 's average grade this semester is 83.75
## Thea 's average grade this semester is 80
## Steve 's average grade this semester is 73.75
## Hanna 's average grade this semester is 90
```

```r
# 8 c

for (j in 2:5) {
  testavg <- sum(Grades[, j]) / nrow(Grades)

  if (testavg < 80) {
    cat("The", colnames(Grades)[j], "test was difficult.\n")
  }
}
```

```
## The Grade2 test was difficult.
```

```r
# 8 d

for (i in 1:nrow(Grades)) {
  studs <- Grades[i, ]
  highscore <- studs$Grade1

   for (j in 2:5) {
    if (studs[[j]] > highscore)
      highscore <- studs[[j]]
    }

 if (highscore > 90) {
    cat(studs$Name, "'s highest grade this semester is", highscore, "\n")
  }
}
```

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