Rworksheet_sayson#4

```
#1.
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

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")
household_data <- data.frame(Shoe_size = shoe_size, Height = height, Gender = gender)

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   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. The dataset contains 28 entries with shoe sizes ranging from 5.0 to 13.0, heights from 59.0 to 77.0
```

```r
#b.
male_data <- subset(household_data, Gender == "M")
female_data <- subset(household_data, Gender == "F")

male_data
```

```
##    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
```

```r
female_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
## 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.
mean(shoe_size)
```

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

```r
mean(height)
```

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

```r
#d. Mostly yes, shoe sizes are shown to correlate according to height; the taller they are the bigger t
```

```r
#2.
months <- c("March","April","January","November","January",
"September","October","September","November","August", "January","November","November","February","May"
"April")
factor_months_vector <- factor(months)
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)
```

```
##    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
#They are both useful as the summary for months shows the length, class, and mode of the data, while th
```

```r
#4.
direct <- c("East", "West", "North")
freq <- c(1,4,3)

factor_data <- factor (direct, levels = c("East","West","North"))
print(factor_data)
```

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

```r
 table_freq <- data.frame(Direction = factor_data, Frequency = freq)
 print(table_freq)
```

```
##   Direction Frequency
## 1      East         1
## 2      West         4
## 3     North         3
```

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

```
##   Students    Sex Strategy.1 Strategy.2 Strategy.3
## 1        1   Male          8         10          8
## 2        2   Male          4          8          6
## 3        3   Male         16          6         12
## 4        4 Female         14          4         15
## 5        5 Female         10          2         12
## 6        6 Female          6          0          9
```

```r
#6.
user_input_str <- readline(prompt = "Please enter a number between 1 and 50: ")
```

```
## Please enter a number between 1 and 50:
```

```r
selected_number <- as.numeric(user_input_str)

if (is.na(selected_number)) {
  cat("Invalid input. Please enter a numerical value.\n")
} else {
  cat("You inputted:", selected_number, "\n")

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

```
## Invalid input. Please enter a numerical value.
```

```r
#7.
calculate_min_bills <- function(price_of_snack) {
  denominations <- c(1000, 500, 200, 100, 50)

  total_bills <- 0

  remaining_amount <- price_of_snack

  for (bill in denominations) {
    num_bills_of_this_type <- remaining_amount %/% bill

    total_bills <- total_bills + num_bills_of_this_type

    remaining_amount <- remaining_amount %% bill


    if (remaining_amount == 0) {
```

```
      break
    }
  }

  return(total_bills)
}

set.seed(as.integer(Sys.time()))
possible_prices <- seq(50, 5000, by = 50)
random_price <- sample(possible_prices, 1)

cat("Snack Price:", random_price, "Pesos\n")
```

```
## Snack Price: 4050 Pesos
```

```
min_count <- calculate_min_bills(random_price)

cat("Minimum number of bills needed:", min_count, "\n")
```

```
## Minimum number of bills needed: 5
```

```
#8.
#a.
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 <- data.frame (
  Name,
  Grade1,
  Grade2,
  Grade3,
  Grade4
)
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
```

```
#b.
Grades$Average <- (Grades$Grade1 + Grades$Grade2 + Grades$Grade3 + Grades$Grade4) / 4
selected <- Grades[Grades$Average > 90, ]
if(nrow(selected) == 0) {
  cat("No students have an average grade over 90.\n")
} else {
  for(i in 1:nrow(selected)) {
    cat(selected$Name[i], "'s average grade this semester is ",
```

```
        selected$Average[i], ".\n", sep = "")
  }
}
```

```
## No students have an average grade over 90.
```

```
#c.
test_avgs <- c(
  (Grades$Grade1[1] + Grades$Grade1[2] + Grades$Grade1[3] + Grades$Grade1[4]) / 4,
  (Grades$Grade2[1] + Grades$Grade2[2] + Grades$Grade2[3] + Grades$Grade2[4]) / 4,
  (Grades$Grade3[1] + Grades$Grade3[2] + Grades$Grade3[3] + Grades$Grade3[4]) / 4,
  (Grades$Grade4[1] + Grades$Grade4[2] + Grades$Grade4[3] + Grades$Grade4[4]) / 4
)

# Identify tests with average < 80 and print message
for(i in 1:4) {
  if(test_avgs[i] < 80) {
    cat("The", i, "th test was difficult.\n")
  }
}
```

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

```
#d.
for(i in 1:nrow(Grades)) {
  g1 <- Grades$Grade1[i]
  g2 <- Grades$Grade2[i]
  g3 <- Grades$Grade3[i]
  g4 <- Grades$Grade4[i]

  highest <- g1
  if(g2 > highest) highest <- g2
  if(g3 > highest) highest <- g3
  if(g4 > highest) highest <- g4

  if(highest > 90) {
    cat(Grades$Name[i], "'s highest grade this semester is ", highest, ".\n", sep = "")
  }
}
```

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