

# RWorksheet\_Redosendo#4a

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#1. Create a data frame.

```
shoe_data <- data.frame(  
  
ShoeSize = c(6.5, 9.0, 8.5, 8.5, 10.5, 7.0, 9.5, 7.0, 7.5, 7.5, 8.5, 10.5,  
13.0, 11.5, 8.5, 5.0, 10.0, 6.5, 7.5, 10.5, 8.0, 11.0, 9.0, 13.0),  
Height = c(66.0, 68.0, 64.5, 65.0, 70.0, 70.0, 71.0, 72.0, 64.0, 64.0, 67.0, 71.0,  
77.0, 72.0, 59.0, 60.0, 72.0, 66.0, 64.0, 69.0, 67.0, 70.0, 69.0, 70.0),  
Gender = c('F', 'F', 'F', 'F', 'M', 'F', 'F', 'F', 'F', 'F', 'M',  
'M', 'M', 'F', 'F', 'M', 'F', 'F', 'M', 'M', 'M', 'M')  
)  
shoe_data
```

```
##      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    70.0     M  
## 6       7.0    70.0     F  
## 7       9.5    71.0     F  
## 8       7.0    72.0     F  
## 9       7.5    64.0     F  
## 10      7.5    64.0     F  
## 11      8.5    67.0     F  
## 12      10.5   71.0     M  
## 13      13.0   77.0     M  
## 14      11.5   72.0     M  
## 15      8.5    59.0     F  
## 16      5.0    60.0     F  
## 17     10.0    72.0     M  
## 18      6.5    66.0     F  
## 19      7.5    64.0     F  
## 20      10.5   69.0     M  
## 21      8.0    67.0     F  
## 22     11.0    70.0     M  
## 23      9.0    69.0     M  
## 24     13.0    70.0     M
```

#a. Describe the data.

```
summary(shoe_data)
```

```
##      ShoeSize           Height          Gender  
##  Min.   : 5.000   Min.   :59.00   Length:24
```

```

## 1st Qu.: 7.500 1st Qu.:64.88 Class :character
## Median : 8.500 Median :68.50 Mode :character
## Mean : 8.917 Mean :67.81
## 3rd Qu.:10.500 3rd Qu.:70.25
## Max. :13.000 Max. :77.00

#b. Create a subset by males and females with their corresponding shoe size and height.What its result?

#females
female_data <- subset(shoe_data, Gender == "F", select = c(ShoeSize, Height))
female_data

## 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   70.0
## 7       9.5   71.0
## 8       7.0   72.0
## 9       7.5   64.0
## 10      7.5   64.0
## 11      8.5   67.0
## 15      8.5   59.0
## 16      5.0   60.0
## 18      6.5   66.0
## 19      7.5   64.0
## 21      8.0   67.0

#males
male_data <- subset(shoe_data, Gender == "M", select = c(ShoeSize, Height))
male_data

## ShoeSize Height
## 5       10.5    70
## 12      10.5    71
## 13      13.0    77
## 14      11.5    72
## 17      10.0    72
## 20      10.5    69
## 22      11.0    70
## 23      9.0     69
## 24      13.0    70

#c. Find the mean of shoe size and height of the respondents. Write the R scripts and its result.
# Mean of respondents
mean_shoe <- mean(shoe_data$ShoeSize)
mean_height <- mean(shoe_data$Height)

mean_shoe

## [1] 8.916667
mean_height

## [1] 67.8125

```

```

#d. Is there a relationship between shoe size and height? Why?
# Correlation test
correlation <- cor(shoe_data$ShoeSize, shoe_data$Height)
correlation

## [1] 0.6723337

#2. Construct character vector months to a factor with factor() and assign the result to factor_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")

# Convert to factor
factor_months_vector <- factor(months_vector)

# Print the factor 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

#3. Then check the summary() of the months_vector and factor_months_vector. / Interpret the results of both

# Summary of character vector
summary(months_vector)

##      Length   Class    Mode
##      24 character character

# Summary of factor vector
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

#4. Create a vector and factor for the table below.
direction <- c("East", "West", "North")
frequency <- c(1, 4, 3)

# Create factor with specific order
factor_data <- factor(direction, levels = c("East", "West", "North"))

# Print the ordered factor
print(factor_data)

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

# Combine into a data frame
table_data <- data.frame(Direction = factor_data, Frequency = frequency)

```

```

print(table_data)

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

#5. Enter the data below in Excel with file name = import_march.csv
#data <- read.table("import_march.csv", header = TRUE, sep = ", ")
#data

#6.Full Search
if (interactive()) {
mode <- tolower(trimws(readline("Enter mode ('r' for random, 'm' for manual): ")))
} else {
mode <- "r"
}

if (mode == "r") {
chosen <- sample(1:50, 1)
cat("Randomly chosen number:", chosen, "\n")
} else if (mode == "m") {
if (interactive()) {
input <- readline("Enter an integer: ")
chosen_num <- suppressWarnings(as.integer(input))
if (is.na(chosen_num)) stop("Invalid input: please enter an integer.")
chosen <- chosen_num
} else {
chosen <- 20
cat("Default number selected for knitting:", chosen, "\n")
}
} else {
stop("Invalid mode. Use 'r' or 'm'.")
}

## Randomly chosen number: 25
if (chosen < 1 || chosen > 50) {
cat("The number selected is beyond the range of 1 to 50\n")
} else if (chosen == 20) {
cat("TRUE\n")
} else {
cat("Selected number:", chosen, "\n")
}

## Selected number: 25
#7. Change
min_bills <- function(price) {
bills <- c(1000, 500, 200, 100, 50)
count <- 0

remaining <- price

for (b in bills) {
if (remaining >= b) {

```

```

n <- remaining %/% b
count <- count + n
remaining <- remaining - n*b
}
}

return(count)
}

# RUN PROGRAM

# generate random price divisible by 50
price <- sample(seq(50, 5000, by = 50), 1)
cat("Price of snack:", price, "\n")

## Price of snack: 4450
cat("Minimum bills needed:", min_bills(price), "\n")

## Minimum bills needed: 7

#8. The following is each student's math score for one semester. Based on this, answer the following questions.

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)

df <- data.frame(Name, Grade1, Grade2, Grade3, Grade4)
df

##      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

cat("\n--- b. average > 90 ---\n")

## --- b. average > 90 ---
# b. without rowMeans
avg <- (df$Grade1 + df$Grade2 + df$Grade3 + df$Grade4) / 4

for(i in 1:nrow(df)){
  if(avg[i] > 90){
    cat(df>Name[i], "'s average grade this semester is ", avg[i], ".\n", sep="")
  }
}

cat("\n--- c. test average < 80 ---\n")

## --- c. test average < 80 ---

```

```

# c. without mean()
testAvg <- c(
  sum(df$Grade1)/4,
  sum(df$Grade2)/4,
  sum(df$Grade3)/4,
  sum(df$Grade4)/4
)

for(i in 1:4){
  if(testAvg[i] < 80){
    cat("The", i, "th test was difficult.\n")
  }
}

## The 2 th test was difficult.

cat("\n--- d. highest > 90 ---\n")

## --- d. highest > 90 ---

# d. without max()
for(i in 1:nrow(df)){
  highest <- sort(c(df$Grade1[i], df$Grade2[i], df$Grade3[i], df$Grade4[i]))[4]
  if(highest > 90){
    cat(df>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.

```