

Rworksheet_Garcia#4a

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```
#1
# Create 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', 'M', 'F', 'F', 'F', 'F', 'F', 'M',
            'M', 'M', 'F', 'M', 'F', 'F', 'M', 'F', '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 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
```

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## 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
# Subset for 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

# Subset for 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
# Mean of all respondents
mean_shoe <- mean(shoe_data$ShoeSize)
mean_height <- mean(shoe_data$Height)

mean_shoe

## [1] 8.916667

mean_height

## [1] 67.8125

# D
# Correlation test
correlation <- cor(shoe_data$ShoeSize, shoe_data$Height)

```

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correlation

## [1] 0.6723337

#2
# Character vector of months (copied exactly)
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
# 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 vector
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
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## 1      East      1
## 2      West      4
## 3    North      3

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

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

#6
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: 2
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: 2
#7
min_bills <- function(price) {
  bills <- c(1000, 500, 200, 100, 50)
  count <- 0
}

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remaining <- price

for (b in bills) {
  if (remaining >= b) {
    n <- remaining %/% b      # how many of that bill
    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: 3900
cat("Minimum bills needed:", min_bills(price), "\n")

## Minimum bills needed: 6
#8
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")

```

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##  

## --- 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.

```