

RWorksheet_Layson#4a

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#1. #a.

```
ShoeSize <- c(6.5, 9, 8.5, 8.5, 10.5, 7, 9.5, 9, 13, 7.5, 10.5, 8.5, 12, 10.5, 13, 11.5, 8.5, 5, 10, 6.5)
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, 70.0, 65.0)
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")
```

```
House_Hold <- data.frame(ShoeSize, Height, Gender)
House_Hold
```

##	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	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

#b.

```
male <- subset(House_Hold, Gender == "M")
male
```

```
##      ShoeSize 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
```

```
female <- subset(House_Hold, Gender == "F")
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
## 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
```

#c.

```
mean(ShoeSize)
```

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

```
mean(Height)
```

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

#d. #Shoe size and height are both characteristics of a person, they are independent of each other. There's no direct connection between how big someone's feet are and how tall they are.

#2.

```
months <- c("March", "April", "January", "November", "January", "September", "October", "September", "November")
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
```

#3.

```
summary(months)
```

```
##      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
```

#4.

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

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

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

```
f_data <- data.frame(Direction = factor_data, Frequency = freq)
f_data
```

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

#5.

```
import_march <- read.table("C:\\Users\\User\\OneDrive\\Desktop\\Rworksheet\\Worksheet_4\\import_march.csv")
import_march
```

```
## 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
```

#6.

```
num <- as.numeric(readline(prompt = "select number from 1 to 50: "))
```

```
## select number from 1 to 50:
```

```
if (is.na(num)) {
  print("Please enter a valid number.")
} else if (num < 1 || num > 50) {
  print("The number selected is beyond the range of 1 to 50.")
} else if (num == 20) {
  print("TRUE")
} else {
  print(paste("The selected number is", num))
}
```

```
## [1] "Please enter a valid number."
```

#7.

```
pay_bills <- c(1000, 500, 200, 100, 50)
count <- 0
min_bills <- function(item_price){

  for(bill in pay_bills){
    if(item_price >= bill){
      count <- count + item_price %% bill
      item_price <- item_price %% bill
    }
  }

  cat("The minimum cash required to buy a snack:", count, "\n")
}

min_bills(1550)
```

```
## The minimum cash required to buy a snack: 600
```

#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

```

#b.

```

ave_grades <- apply(grades[, 2:5], 1, function(x) sum(x) / length(x))

highest_avg_index <- which.max(ave_grades)
highest_avg_student <- grades$Name[highest_avg_index]
highest_avg_grade <- ave_grades[highest_avg_index]

cat("The student with the highest average grade is", highest_avg_student, "with an average of", highest_avg_grade, "\n")

```

```

## The student with the highest average grade is Hanna with an average of 90 .

```

#8c

```

for (j in 2:5) {
  test_scores <- grades[, j]
  test_average <- mean(test_scores)
  if (test_average < 80) {
    cat("The ", names(grades)[j], " test was difficult.\n", sep = "")
  }
}

```

```

## The Grade2 test was difficult.

```

#8d

```

for (i in 1:nrow(grades)) {
  student_grades <- grades[i, 2:5]
  highest_grade <- max(student_grades)
  if (highest_grade > 90) {
    cat(grades$Name[i], "'s highest grade this semester is ", highest_grade, ".\n", sep = "")
  }
}

```

```

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

```