

## RWorksheet 4a

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1.

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

```
#A. The vector "sHOE" has a column name shoe_size and height
# and you can see the inputted values.
```

```
sHOE <- data.frame(
  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, 8.5),
  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, 70.0, 65.0)
)
```

##	Shoe_size	Height
## 1	6.5	66.0
## 2	9.0	68.0
## 3	8.5	64.5
## 4	8.5	65.0
## 5	10.5	70.0
## 6	7.0	64.0
## 7	9.5	70.0
## 8	9.0	71.0
## 9	13.0	72.0
## 10	7.5	64.0
## 11	10.5	74.5
## 12	8.5	67.0
## 13	12.0	71.0
## 14	10.5	71.0
## 15	13.0	77.0
## 16	11.5	72.0
## 17	8.5	59.0
## 18	5.0	62.0
## 19	10.0	72.0
## 20	6.5	66.0
## 21	7.5	64.0
## 22	8.5	67.0
## 23	10.5	73.0
## 24	8.5	69.0
## 25	10.5	72.0
## 26	11.0	70.0
## 27	9.0	69.0
## 28	13.0	70.0

*#B.*

```
Gender <- c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F", "M", "F", "F", "M")
SHOE <- cbind(SHOE, Gender)
SHOE
```

```
##      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
```

*#C.*

```
mean(SHOE$Shoe_size)
```

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

```
mean(SHOE$Height)
```

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

*#D. There is a relation because you can determine the gender  
# based on their shoe size and height alone.*

*2.*

```
## [1] 2
```

```
factor_months_vector <- factor(c("March", "April", "January", "November", "January", "September", "October", "November", "January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", "December"))
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.

```
## [1] 3
```

```
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.

```
## [1] 4
```

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

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

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

5.

```
## [1] 5
```

```
df <- read.table(file='/cloud/project/Worksheet#4/import_march.csv', header=TRUE, sep=',')
df
```

```
##   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.

```
## [1] 6
```

```
Input_Number <- readline(prompt = "Enter a number between 1-50: ")
```

```
## Enter a number between 1-50:
```

```
if (Input_Number == 20 ){
  print("TRUE")
} else if (Input_Number < 1 && Input_Number > 50){
  print("The number selected is beyond the range of 1 to 50")
} else {
  paste(Input_Number)
}
```

```
## [1] ""
```

#7.

```
calculate_min_bills <- function(price_of_snack) {
  bill_denominations <- c(1000, 500, 200, 100, 50)
```

```

total_bills <- 0

for (bill in bill_denominations) {
  num_bills_needed <- price_of_snack %/% bill
  price_of_snack <- price_of_snack %% bill
  total_bills <- total_bills + num_bills_needed
}

cat("Minimum number of bills needed to purchase the snack:", total_bills, "\n")
}

price_of_snack <- 1350
calculate_min_bills(price_of_snack)

```

```
## Minimum number of bills needed to purchase the snack: 4
```

```
8.
```

```
## [1] 8
```

```

#a.
students <- 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)
)
students

```

```

##      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.
```

```

students$Average <- (students$Grade1 + students$Grade2 + students$Grade3 + students$Grade4) / 4

for (i in 1:nrow(students)) {
  if (students$Average[i] > 90) {
    cat(students$Name[i], "'s average grade this semester is", students$Average[i], "\n")
  }
}

```

```
#c
```

```

test1_average <- sum(students$Grade1) / nrow(students)
test2_average <- sum(students$Grade2) / nrow(students)
test3_average <- sum(students$Grade3) / nrow(students)
test4_average <- sum(students$Grade4) / nrow(students)

if (test1_average < 80) {
  cat("The 1st test was difficult.\n")
}
if (test2_average < 80) {
  cat("The 2nd test was difficult.\n")
}

```

```

}

## The 2nd test was difficult.
if (test3_average < 80) {
  cat("The 3rd test was difficult.\n")
}
if (test4_average < 80) {
  cat("The 4th test was difficult.\n")
}

#d.
for (i in 1:nrow(students)) {
  highest_grade <- students$Grade1[i]
  if (students$Grade2[i] > highest_grade) {
    highest_grade <- students$Grade2[i]
  }
  if (students$Grade3[i] > highest_grade) {
    highest_grade <- students$Grade3[i]
  }
  if (students$Grade4[i] > highest_grade) {
    highest_grade <- students$Grade4[i]
  }
  if (highest_grade > 90) {
    cat(students$Name[i], "'s highest grade this semester is", highest_grade, "\n")
  }
}

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

```