

# RWorksheet\_Langreo#4a

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```
#1
shoesize1 <- 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)
height1 <- c(66.0, 68.0, 64.5, 65.0, 70.0, 64.0, 70.0, 71.0, 72.0, 64.0, 74.0, 67.0, 71.0, 71.0)
gender1 <- c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M")

shoesize2 <- c(13.0, 11.5, 8.5, 5.0, 10.0, 6.5, 7.5, 8.5, 10.5, 8.5, 10.5, 11.0, 9.0, 13.0)
height2 <- c(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)
gender2 <- c("M", "M", "F", "F", "M", "F", "F", "M", "M", "F", "M", "M", "M", "M")

df <- data.frame(ShoeSize = c(shoesize1, shoesize2), Height = c(height1, height2), Gender = c(gender1, gender2))
df
```

##	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	74.0	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

```
#1a.
#The data is consists of the different shoe size with corresponding height and gender of the user.
```

```
#1b.
male_data <- subset(df, Gender == "M")
female_data <- subset(df, Gender == "F")
```

```
male_data
```

```
##      ShoeSize Height Gender
## 5         10.5     70      M
## 9         13.0     72      M
## 11        10.5     74      M
## 13        12.0     71      M
## 14        10.5     71      M
## 15        13.0     77      M
## 16        11.5     72      M
## 19        10.0     72      M
## 22         8.5     67      M
## 23        10.5     73      M
## 25        10.5     72      M
## 26        11.0     70      M
## 27         9.0     69      M
## 28        13.0     70      M
```

```
female_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
## 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
```

```
#1c.
shoesize <- 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)
height <- c(66.0, 68.0, 64.5, 65.0, 70.0, 64.0, 70.0, 71.0, 72.0, 64.0, 74.0, 67.0, 71.0, 71.0)
mean_shoesize <- mean(shoesize)
mean_height <- mean(height)
mean_shoesize
```

```
## [1] 9.321429
```

```
mean_height
```

```
## [1] 68.39286
```

```

#1d.
correlation <- cor(df$ShoeSize, df$Height, use = "complete.obs")
print(paste("Correlation between shoe size and height:", correlation))

## [1] "Correlation between shoe size and height: 0.779186612606297"

#2
monthsvec <- c("March", "April", "Januay", "November", "January", "September", "October", "September",
factor_monthsvec <- factor(monthsvec)

factor_monthsvec

## [1] March      April      Januay     November   January    September  October
## [8] September  November   August     January    November   February   May
## [15] August     july       December   August     August     September  November
## [22] February   April
## 12 Levels: April August December February January Januay july March ... September
levels(factor_monthsvec)

## [1] "April"      "August"      "December"    "February"    "January"     "Januay"
## [7] "july"       "March"       "May"         "November"    "October"     "September"

#3.
summary(monthsvec)

##      Length      Class      Mode
##      23 character character

summary(factor_monthsvec)

##      April      August    December    February    January     Januay      july      March
##          2          4          1          2          2          1          1          1
##      May    November    October    September
##          1          4          1          3

#4
direction <- c("East", "West", "North")
frequency <- c(1,4,3)
factor_data <- factor(direction, levels = c("East", "West", "North"))
factor_data

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

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

#5
write.csv("import_march.csv", row.names = FALSE)

## "x"
## "import_march.csv"

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

##      mpg cyl  disp  hp drat   wt  qsec vs am gear carb
## 1  21.0   6 160.0 110 3.90 2.620 16.46  0  1   4    4
## 2  21.0   6 160.0 110 3.90 2.875 17.02  0  1   4    4
## 3  22.8   4 108.0  93 3.85 2.320 18.61  1  1   4    1

```

```
## 4 21.4 6 258.0 110 3.08 3.215 19.44 1 0 3 1
## 5 18.7 8 360.0 175 3.15 3.440 17.02 0 0 3 2
## 6 18.1 6 225.0 105 2.76 3.460 20.22 1 0 3 1
## 7 14.3 8 360.0 245 3.21 3.570 15.84 0 0 3 4
## 8 24.4 4 146.7 62 3.69 3.190 20.00 1 0 4 2
## 9 22.8 4 140.8 95 3.92 3.150 22.90 1 0 4 2
## 10 19.2 6 167.6 123 3.92 3.440 18.30 1 0 4 4
## 11 17.8 6 167.6 123 3.92 3.440 18.90 1 0 4 4
## 12 16.4 8 275.8 180 3.07 4.070 17.40 0 0 3 3
## 13 17.3 8 275.8 180 3.07 3.730 17.60 0 0 3 3
## 14 15.2 8 275.8 180 3.07 3.780 18.00 0 0 3 3
## 15 10.4 8 472.0 205 2.93 5.250 17.98 0 0 3 4
## 16 10.4 8 460.0 215 3.00 5.424 17.82 0 0 3 4
## 17 14.7 8 440.0 230 3.23 5.345 17.42 0 0 3 4
## 18 32.4 4 78.7 66 4.08 2.200 19.47 1 1 4 1
## 19 30.4 4 75.7 52 4.93 1.615 18.52 1 1 4 2
## 20 33.9 4 71.1 65 4.22 1.835 19.90 1 1 4 1
## 21 21.5 4 120.1 97 3.70 2.465 20.01 1 0 3 1
## 22 15.5 8 318.0 150 2.76 3.520 16.87 0 0 3 2
## 23 15.2 8 304.0 150 3.15 3.435 17.30 0 0 3 2
## 24 13.3 8 350.0 245 3.73 3.840 15.41 0 0 3 4
## 25 19.2 8 400.0 175 3.08 3.845 17.05 0 0 3 2
## 26 27.3 4 79.0 66 4.08 1.935 18.90 1 1 4 1
## 27 26.0 4 120.3 91 4.43 2.140 16.70 0 1 5 2
## 28 30.4 4 95.1 113 3.77 1.513 16.90 1 1 5 2
## 29 15.8 8 351.0 264 4.22 3.170 14.50 0 1 5 4
## 30 19.7 6 145.0 175 3.62 2.770 15.50 0 1 5 6
## 31 15.0 8 301.0 335 3.54 3.570 14.60 0 1 5 8
## 32 21.4 4 121.0 109 4.11 2.780 18.60 1 1 4 2
```

```
#6
exhaustive_search <- function() {
  chosen_number <- sample(1:50, 1)
  if (chosen_number < 1 || chosen_number > 50) {
    print("The number chosen is beyond the range of 1 to 50")
  } else if (chosen_number == 20) {
    print(TRUE)
  } else {
    print(chosen_number)
  }
}

exhaustive_search()
```

```
## [1] 46
```

```
#7
price_input <- as.numeric(readline(prompt = "Enter the price of the snack (divisible by 50): "))

## Enter the price of the snack (divisible by 50):
## Enter the price of the snack (divisible by 50):
calculate_minimum_bills <- function(price) {
  if (is.na(price)) {
    cat("Please enter a valid number.\n")
    return()
  }
}
```

```

}
if (price %% 50 != 0) {
cat("Price must be a number divisible by 50.\n")
} else {
denominations <- c(1000, 500, 200, 100, 50)
bill_count <- 0
for (denom in denominations) {
if (price >= denom) {
count <- price %% denom
bill_count <- bill_count + count
price <- price - (count * denom)
}
}
if (bill_count > 0) {
cat("Minimum number of bills needed:", bill_count, "\n")
} else {
cat("No bills needed.\n")
}
}
}
calculate_minimum_bills(price_input)

```

## Please enter a valid number.

## NULL

#8

```

students <- data.frame(
  Names = 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

```

```

##   Names 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

```

#8b.

```

for (i in 1:nrow(students)) { avg_score <- (students$Grade1[i] + students$Grade2[i] + students$Grade3[i])
if (avg_score > 90) { cat(students$Name[i], "'s average grade this semester is", avg_score, "\n")
} else { cat(students$Name[i], "'s average grade is below 90.\n") }
}

```

## Annie 's average grade is below 90.

## Thea 's average grade is below 90.

## Steve 's average grade is below 90.

## Hanna 's average grade is below 90.

#8.c

```

for(test in 2:5){
  total_score <- 0
  num_students <- nrow(students)

```

```

for(i in 1:num_students) {
  total_score <- total_score + students[i, test] }
  average_score <- total_score / num_students
if (average_score < 80) { cat("The", test - 1, "test was difficult.\n")
} else { cat("The", test - 1, "test was not difficult.\n") }
}

```

```

## The 1 test was not difficult.
## The 2 test was difficult.
## The 3 test was not difficult.
## The 4 test was not difficult.

```

```

#8d.
for(i in 1:nrow(students)) {
  highest_score <- 0
  student_name <- students$Name[i]
  for (j in 2:5) {
    if (students[i, j] > highest_score) {
      highest_score <- students[i, j]
    }
  }
  if (highest_score > 90) {
    cat(student_name, "'s highest grade this semester is", highest_score, ".\n") }
  }
}

```

```

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

```