RWorksheet_Liza#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
```

```
write.csv(df, "sample_data.csv", row.names = FALSE)
# 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
mean_shoesize <- mean(df$ShoeSize)
mean_height <- mean(df$Height)

mean_shoesize
```

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

```
mean_height
```

```
## [1] 68.55357
```

```
# 1d
correlation <- cor(df$ShoeSize, df$Height, use = "complete.obs")
```

```r
print(paste("Correlation between Shoe Size and Height:", correlation))
```

```
## [1] "Correlation between Shoe Size and Height: 0.779186612606297"
```

```r
# 2
monthsvec <- c("March","April","January","November","January",
"September","October","September","November","August", "January","November","November","February","May"
"July","December","August","August","September","November","February", "April")

factor_monthsvec <- factor(monthsvec)

factor_monthsvec
```

```
##  [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
```

```r
levels(factor_monthsvec)
```

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

```r
# 3
summary(monthsvec)
```

```
##    Length     Class      Mode
##        24 character character
```

```r
summary(factor_monthsvec)
```

```
##     April    August  December  February   January      July     March       May
##         2         4         1         2         3         1         1         1
##  November   October September
##         5         1         3
```

```r
# 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
```

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

new_order_data
```

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

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

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

```r
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
```

```r
# 6
# 6
rand <- 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)
}
}
rand()
```

```
## [1] 17
```

```r
rand()
```

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

```r
# 7
min_bills <- function(price){
4
bills <- c(50, 100, 200, 500, 1000)
count <- 0
for (bill in bills){
count <- count + price %/% bill
price <- price %% bill
}
return(count)
}
snackPrice <- as.integer(readline(prompt = "Enter the price of the snack:"))
```

```
## Enter the price of the snack:
```

```r
print(paste("Minimum number of bills needed: ", min_bills(snackPrice)))
```

```
## [1] "Minimum number of bills needed:  NA"
```

```r
# 8a
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
```

```r
for (i in 1:nrow(grades)) {
  highest <- grades[i, 2]
  for (j in 3:5) {
    if (grades[i, j] > highest) {
      highest <- grades[i, j]
    }
  }
  if (highest > 90) {
    cat(grades$Name[i], "'s highest grade this semester is", highest, "\n")
  }
}
```

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