

RWorksheet_Gallenero#4a

2023-10-25

#1. Create a data frame

```
df_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, 5.0, 10.0, 6.5,  
             7.5, 8.5, 10.5, 8.5,10.5, 11.0, 9.0, 13.0),  
  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, 72.0,66.0, 64.0,  
          67.0,73.0, 69.0, 72.0, 70.0,69.0, 70.0),  
  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",  
            "F", "M", "M", "M","M"))  
df_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 |

#a.

This data set includes information about each person's # height, shoe size, and gender.

```
#b.
female_subset <- df_shoe[df_shoe$Gender == "F", c("Gender", "Shoe_Size", "Height")]
female_subset
```

```
##      Gender Shoe_Size Height
## 1      F      6.5    66.0
## 2      F      9.0    68.0
## 3      F      8.5    64.5
## 4      F      8.5    65.0
## 6      F      7.0    64.0
## 7      F      9.5    70.0
## 8      F      9.0    71.0
## 10     F      7.5    64.0
## 12     F      8.5    67.0
## 17     F      8.5    59.0
## 18     F      5.0    62.0
## 20     F      6.5    66.0
## 21     F      7.5    64.0
## 24     F      8.5    69.0
```

```
male_subset <- df_shoe[df_shoe$Gender == "M", c("Gender", "Shoe_Size", "Height")]
male_subset
```

```
##      Gender Shoe_Size Height
## 5      M     10.5    70.0
## 9      M     13.0    72.0
## 11     M     10.5    74.5
## 13     M     12.0    71.0
## 14     M     10.5    71.0
## 15     M     13.0    77.0
## 16     M     11.5    72.0
## 19     M     10.0    72.0
## 22     M      8.5    67.0
## 23     M     10.5    73.0
## 25     M     10.5    72.0
## 26     M     11.0    70.0
## 27     M      9.0    69.0
## 28     M     13.0    70.0
```

```
# c.
mean_shoesize <- mean(df_shoe$Shoe_Size)
mean_shoesize
```

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

```
mean_height <- mean(df_shoe$Height)
mean_height
```

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

```
# d.
```

The relationship between the two is that height and shoe size are directly proportional. A short height

#2. Constructing the character vector months

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

```
# Converting the character vector months to a factor
```

```
factor_months_vector <- factor(months_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(months_vector)
```

```
##      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
```

```
Direction <- c("East", "West", "North")
```

```
Direction
```

```
## [1] "East" "West" "North"
```

```
Frequency <- c(1,4,3)
```

```
Frequency
```

```
## [1] 1 4 3
```

```
factor_data <- factor(c(Direction, Frequency))
```

```
factor_data
```

```
## [1] East West North 1 4 3
```

```
## Levels: 1 3 4 East North West
```

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

```
print(new_order_data)
```

```
## [1] East West North <NA> <NA> <NA>
```

```
## Levels: East West North
```

```
#5
```

```
import_table <- read.table(file = "/cloud/project/worksheet#4/import_march.csv", header = TRUE, sep =
```

```
import_table
```

```
##      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
random_num <- readline(prompt = "Enter number from 1 to 50: ")
```

```
## Enter number from 1 to 50:
#cant knit if there is as.numeric
#random_num <- as.numeric(random_num)

paste("The number you have chosen is", random_num)
```

```
## [1] "The number you have chosen is "
if (random_num > 50) {
  paste("The number selected is beyond the range of 1 to 50")
} else if (random_num == 20) {
  paste("TRUE")
} else {
  paste(random_num)
}
```

```
## [1] ""

#7
minimumBills <- function(price) {

  minBills <- price %/% 50
  paste("The minimum no. of bills:", minBills)
}

minimumBills(90)
```

```
## [1] "The minimum no. of bills: 1"

#8

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)

grade <- data.frame(
  Name = names,
  Grade1 = grade1,
  Grade2 = grade2,
  Grade3 = grade3,
  Grade4 = grade4
)
grade
```

```
##      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
```

```
# 8.b

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

highScorers <- grade[grade$Average > 90,]
highScorers

## [1] Name      Grade1 Grade2 Grade3 Grade4 Average
## <0 rows> (or 0-length row.names)

if (nrow(highScorers) > 0) {
  paste(highScorers$Name, "'s average grade this semester is", highScorers$Average)
} else {
  paste("No students have an average math score over 90.")
}

## [1] "No students have an average math score over 90."
```

```
# 8.c

first_test <- sum(grade$Grade1) / nrow(grade)
first_test

## [1] 80

second_test <- sum(grade$Grade2) / nrow(grade)
second_test
```

```
## [1] 67.5

third_test <- sum(grade$Grade3) / nrow(grade)
third_test
```

```
## [1] 88.75

fourth_test <- sum(grade$Grade4) / nrow(grade)
fourth_test
```

```
## [1] 91.25

if (first_test < 80) {
  paste("The 1st test was difficult.")
} else if (second_test < 80) {
  paste("The 2nd test was difficult.")
} else if (third_test < 80) {
  paste("The 3rd test was difficult.")
} else if (fourth_test < 80) {
  paste("The 4th test was difficult.")
} else {
  paste("No test had an average score less than 80.")
}
```

```
## [1] "The 2nd test was difficult."
```

```
# Annie

if (grade[1,2] > grade[1,3] && grade[1,2] > grade[1,4] && grade[1,2] > grade[1,5]) {
  annieHighest <- grade[1,2]
} else if (grade[1,3] > grade[1,4] && grade[1,3] > grade[1,5]) {
  annieHighest <- grade[1,3]
```

```

} else if (grade[1,4] > grade[1,5] && grade[1,2] > grade[1,5]) {
  annieHighest <- grade[1,4]
} else {
  annieHighest <- grade[1,5]
}

# Thea
if (grade[2,2] > grade[2,3] && grade[2,2] > grade[2,4] && grade[2,2] > grade[2,5]) {
  theaHighest <- grade[2,2]
} else if (grade[2,3] > grade[2,4] && grade[2,3] > grade[2,5]) {
  theaHighest <- grade[2,3]
} else if (grade[2,4] > grade[2,5] && grade[2,2] > grade[2,5]) {
  theaHighest <- grade[2,4]
} else {
  theaHighest <- grade[2,5]
}

# Steve
if (grade[3,2] > grade[3,3] && grade[3,2] > grade[3,4] && grade[3,2] > grade[3,5]) {
  steveHighest <- grade[3,2]
} else if (grade[3,3] > grade[3,4] && grade[3,3] > grade[3,5]) {
  steveHighest <- grade[3,3]
} else if (grade[3,4] > grade[3,5] && grade[3,2] > grade[3,5]) {
  steveHighest <- grade[3,4]
} else {
  steveHighest <- grade[3,5]
}

# Hanna
if (grade[4,2] > grade[4,3] && grade[4,2] > grade[4,4] && grade[4,2] > grade[4,5]) {
  hannaHighest <- grade[4,2]
} else if (grade[4,3] > grade[4,4] && grade[4,3] > grade[4,5]) {
  hannaHighest <- grade[4,3]
} else if (grade[4,4] > grade[4,5] && grade[4,2] > grade[4,5]) {
  hannaHighest <- grade[4,4]
} else {
  hannaHighest <- grade[4,5]
}

grade$HighestGrades <- c(annieHighest, theaHighest, steveHighest, hannaHighest)

above90 <- grade[grade$HighestGrades > 90,]
above90

##      Name Grade1 Grade2 Grade3 Grade4 Average HighestGrades
## 1 Annie      85      65      85     100  83.75          100
## 4 Hanna      95      75     100      90  90.00          100

if (nrow(above90) > 0) {
  paste(above90$Name, "'s highest grade this semester is", above90$HighestGrade)
} else {
  paste("No students have an average math score over 90.")
}

```

```
## [1] "Annie 's highest grade this semester is 100"  
## [2] "Hanna 's highest grade this semester is 100"
```