

RWorksheet_Olivo#4a

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```
# 1  
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, 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, 72.0, 59.0, 62.0)  
gender <- c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F", "F")  
  
householdData <- data.frame(  
  ShoeSize = shoeSize,  
  Height = height,  
  Gender = gender  
)  
  
householdData
```

##	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
```

```
# 1.a
```

```
# In the data, there are three variables which are the shoe size, height, and gender. There are 28 observations.
```

```
# 1.b
```

```
males <- householdData[householdData$Gender == "M",]
males
```

```
##      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
```

```
females <- householdData[householdData$Gender == "F",]
females
```

```
##      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
```

```
# 1.c
```

```
meanOfShoeSize <- mean(householdData$ShoeSize)
meanOfShoeSize
```

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

```
meanOfHeight <- mean(householdData$Height)
meanOfHeight
```

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

```

# 1.d
# The relationship of the two is that the shoe size is directly proportional to the height. If the height is 1.8m, the shoe size is 42.

#-----

# 2
months_vector <- c("March", "April", "January", "November", "January", "September", "October", "September", "November")

months_vector

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

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

# In the summary of months_vector, it shows the number of observations, class, and mode of the vector.

# In the summary of factor_months_vector, it shows the frequency of each months.

# Both are useful in different cases where the no. of observations, class, mode, or the frequency is needed.

# -----

# 4

factor_data <- c("East", "West", "North")
factor_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
imported_table <- read.table(file = "/cloud/project/worksheet#4/import_march.csv", header = TRUE, sep = ";")
imported_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

randomNum <- readline(prompt = "Enter number from 1 to 50: ")

## Enter number from 1 to 50:
#randomNum <- as.numeric(randomNum)

paste("The number you have chosen is", randomNum)

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

## [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.a

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)

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

# 8.b

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

highscorers <- mathScore[mathScore$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

firstTest <- sum(mathScore$Grade1) / nrow(mathScore)
firstTest

## [1] 80

secondTest <- sum(mathScore$Grade2) / nrow(mathScore)
secondTest

## [1] 67.5

thirdTest <- sum(mathScore$Grade3) / nrow(mathScore)
thirdTest

## [1] 88.75

fourthTest <- sum(mathScore$Grade4) / nrow(mathScore)
fourthTest

## [1] 91.25

```

```

if (firstTest < 80) {
  paste("The 1st test was difficult.")
} else if(secondTest < 80) {
  paste("The 2nd test was difficult.")
} else if(thirdTest < 80) {
  paste("The 3rd test was difficult.")
} else if(fourthTest < 80) {
  paste("The 4th test was difficult.")
} else {
  paste("No test had an average score less than 80.")
}

```

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

```
# 8.d
```

```
# annie scores
```

```

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

```

```
# thea scores
```

```

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

```

```
# steve scores
```

```

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

```

```
# hanna scores
```

```

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

```

```

} else if (mathScore[4,4] > mathScore[4,5] && mathScore[4,2] > mathScore[4,5]) {
  hannaHighest <- mathScore[4,4]
} else {
  hannaHighest <- mathScore[4,5]
}

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

above90 <- mathScore[mathScore$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"

```