

# RWorksheet#4\_Obas

2023-10-25

```
household_data <- 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, 72.0,  
Gender= c( "F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F", "M"  
  
household_data
```

```
##      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
```

```
write.csv(household_data, file = "Household_Data.csv")
```

*#1.a*

*#This data frame shows the Gender, Height and Shoe Size of each person.*

#1.b

```
females_subset <- household_data[household_data$Gender == "F", c("Gender", "Shoe_Size", "Height")]
females_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
```

```
males_subset <- household_data[household_data$Gender == "M", c("Gender", "Shoe_Size", "Height")]
males_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
```

#1.c

```
mean_shoe_size <- mean(household_data$Shoe_Size)
mean_height <- mean(household_data$Height)
```

```
mean_shoe_size
```

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

```
mean_height
```

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

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

```
factor_months_vector <- factor(months)
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)
```

```
##      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

```
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:
```

```

#cant knit if there is as.numeric
#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"

```