

# rworksheet

2023-10-28

```
#RWorksheet_4a
```

```
#1. #1a 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, 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", "M", "F", "F", "M", "F", "F", "M", "M", "F", "M", "M", "M", "M", "M")
```

```
householdData <- data.frame( shoeSize = shoeSize, Height = Height, Gender = Gender ) householdData
```

```
#1b. males<- householdData[householdData$Gender == "M", c("Gender", "shoeSize", "Height")] males
```

```
fem <- householdData[householdData$Gender == "F", c("Gender", "shoeSize", "Height")] fem
```

```
#1c. shoe_mean <- mean(householdData$shoeSize) shoe_mean
```

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

```
#1d. #Yes, the higher the height, the bigger the shoe size.
```

```
#2.
```

```
nameofMonths <- c("March", "April", "January", "November", "January", "September", "October", "September", "November", "August", "January", "November", "November", "February", "May", "August", "July", "December", "August", "August", "September", "November")
```

```
factor_months_vector <- factor(nameofMonths) factor_months_vector
```

```
#3. summary(nameofMonths) summary(factor_months_vector) #The summary of factor is more useful than the first summary which is the summary of the vector.
```

```
#4. direction <- c("East", "West", "North") freq <- c(1,4,3)
```

```
factordirect <- factor(direction) factorFreq <- factor(freq)
```

```
new_data <- factor(factordirect, levels = c("East", "West", "North")) print(new_data)
```

```
new_data2 <- factor(factorFreq, levels = c(1,4,3)) print(new_data2)
```

```
#5. #5a. excel_data <- read.csv("import_march.csv") excel_data
```

```
#6. numinp <- as.numeric(readline(prompt = "Enter number:"))
```

```
if (numinp > 50) { print("The number you entered is beyond the range of 1 to 50") } else { if (numinp == 20) { print("TRUE") } else { print(numinp) } }
```

```
#7.
```

```
calculateMinBills <- function() {
```

```
bills <- c(1000, 500, 200, 100, 50)
```

```
amount <- as.numeric(readline("Enter the price of the snack (a multiple of 50 pesos):"))
```

```
if (is.na(amount) || amount %% 50 != 0) { cat("Invalid input. Price must be a multiple of 50 pesos")
```

```

}
snackprice <- amount
bill1000 <- 0 bill500 <- 0 bill200 <- 0 bill100 <- 0 bill50 <- 0

if (snackprice >= 1000) { bill1000 <- snackprice %/% 1000 snackprice <- snackprice %% 1000 } if (snackprice
>= 500) { bill500 <- snackprice %/% 500 snackprice <- snackprice %% 500 } if (snackprice >= 200) { bill200
<- snackprice %/% 200 snackprice <- snackprice %% 200 } if (snackprice >= 100) { bill100 <- snackprice
%/% 100 snackprice <- snackprice %% 100 } if (snackprice >= 50) { bill50 <- snackprice %/% 50 }

cat("Price:", amount, "pesos") cat("Minimum number of bills needed:") cat("1000 pesos:", bill1000, "bills")
cat("500 pesos:", bill500, "bills") cat("200 pesos:", bill200, "bills") cat("100 pesos:", bill100, "bills") cat("50
pesos:", bill50, "bills") }

```

```
calculateMinBills()
```

```

studgrades <- 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)
)
studgrades

```

```

##      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

```

```
studgrades$Average <- (studgrades$Grade1 + studgrades$Grade2 + studgrades$Grade3 + studgrades$Grade4) /
```

```
HighGrades <- studgrades[studgrades$Average > 90, ]
```

```

if(nrow(HighGrades)>0){
  print(HighGrades$Name, 's average grade this semester is:', HighGrades)
}else{
  print("there is no student that got 90 average grades")
}

```

```
## [1] "there is no student that got 90 average grades"
```

*#8c Without using the mean function, output as follows for the tests in which the average score was less than 80*

```
AverageScores <- colMeans(studgrades[, -1])
```

```

if (AverageScores[1] < 80) {
  print("The 1st test was difficult.\n")
}else if (AverageScores[2] < 80) {
  print("The 2nd test was difficult.\n")
}else if (AverageScores[3] < 80) {
  print("The 3rd test was difficult.\n")
}else if (AverageScores[4] < 80) {
  print("The 4th test was difficult.\n")
}else{

```

```

    print("No test that students find it difficult")
}

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

#8d Without using the max function, output as follows for students whose highest score for a semester

#Annie Scores

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

# Thea Scores
if (studgrades[2,2] > studgrades[2,3] && studgrades[2,2] > studgrades[2,4] && studgrades[2,2] > studgrades[2,5]) {
  TheaScores <- studgrades[2,2]
} else if (studgrades[2,3] > studgrades[2,4] && studgrades[2,3] > studgrades[2,5]) {
  theaScores <- studgrades[2,3]
} else if (studgrades[2,4] > studgrades[2,5] && studgrades[2,2] > studgrades[2,5]) {
  TheaScores <- studgrades[2,4]
} else {
  TheaScores <- studgrades[2,5]
}

# Steve Scores
if (studgrades[3,2] > studgrades[3,3] && studgrades[3,2] > studgrades[3,4] && studgrades[3,2] > studgrades[3,5]) {
  SteveScores <- studgrades[3,2]
} else if (studgrades[3,3] > studgrades[3,4] && studgrades[3,3] > studgrades[3,5]) {
  SteveScores <- studgrades[3,3]
} else if (studgrades[3,4] > studgrades[3,5] && studgrades[3,2] > studgrades[3,5]) {
  SteveScores <- studgrades[3,4]
} else {
  SteveScores <- studgrades[3,5]
}

# Hanna Scores
if (studgrades[4,2] > studgrades[4,3] && studgrades[4,2] > studgrades[4,4] && studgrades[4,2] > studgrades[4,5]) {
  HannaScores <- studgrades[4,2]
} else if (studgrades[4,3] > studgrades[4,4] && studgrades[4,3] > studgrades[4,5]) {
  HannaScores <- studgrades[4,3]
} else if (studgrades[4,4] > studgrades[4,5] && studgrades[4,2] > studgrades[4,5]) {
  HannaScores <- studgrades[4,4]
} else {
  HannaScores <- studgrades[4,5]
}

studgrades$HighestGrades <- c(AnnieScores, TheaScores, SteveScores, HannaScores)

```

```

NinetyHighest <- studgrades[studgrades$HighestGrades > 90,]
NinetyHighest

##      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(NinetyHighest) > 0) {
  paste(NinetyHighest$Name, "'s highest grade this semester is", NinetyHighest$HighestGrades)
} 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"

```