RWorksheet_montealto#4a

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1. The table below shows the data about shoe size and height. Create a data frame.

```
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, 11.15, 8
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, 7
Gender <- c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F", "
```

```
ShoeHeightdf <- data.frame(ShoeSize = ShoeSize, Height = Height, Gender = Gender)
ShoeHeightdf
```

```
##    ShoeSize Height Gender
## 1      6.50   66.0      F
## 2      9.00   68.0      F
## 3      8.50   64.5      F
## 4      8.50   65.0      F
## 5     10.50   70.0      M
## 6      7.00   64.0      F
## 7      9.50   70.0      F
## 8      9.00   71.0      F
## 9     13.00   72.0      M
## 10     7.50   64.0      F
## 11    10.50   74.5      M
## 12     8.50   67.0      F
## 13    12.00   71.0      M
## 14    10.50   71.0      M
## 15    13.00   77.0      M
## 16    11.15   72.0      M
## 17     8.50   59.0      F
## 18     5.00   62.0      F
## 19    10.00   72.0      M
## 20     6.50   66.0      F
## 21     7.50   64.0      F
## 22     8.50   67.0      M
## 23    10.50   73.0      M
## 24     8.50   69.0      F
## 25    10.50   72.0      M
## 26    11.00   70.0      M
## 27     9.00   69.0      M
## 28    13.00   70.0      M
```

   a. Describe the data.

-It includes shoe size, height, and gender.

   b. Create a subset by males and females with their corresponding shoe size and height. What its result? Show the R scripts.

```
MaleSubset <- subset(ShoeHeightdf, Gender == "M")
FemaleSubset <- subset(ShoeHeightdf, Gender == "F")
MaleSubset
```

```
##    ShoeSize Height Gender
## 5     10.50   70.0      M
## 9     13.00   72.0      M
## 11    10.50   74.5      M
## 13    12.00   71.0      M
## 14    10.50   71.0      M
## 15    13.00   77.0      M
## 16    11.15   72.0      M
## 19    10.00   72.0      M
## 22     8.50   67.0      M
## 23    10.50   73.0      M
## 25    10.50   72.0      M
## 26    11.00   70.0      M
## 27     9.00   69.0      M
## 28    13.00   70.0      M
```

```
FemaleSubset
```

```
##    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
```

c. Find the mean of shoe size and height of the respondents. Write the R scripts and its result.

```
meanShoeSize <- mean(ShoeHeightdf$ShoeSize)
meanHeight <- mean(ShoeHeightdf$Height)
print(paste("Mean Shoe Size:", meanShoeSize))
```

```
## [1] "Mean Shoe Size: 9.39821428571429"
```

```
print(paste("Mean Height:", meanHeight))
```

```
## [1] "Mean Height: 68.5714285714286"
```

d.Is there a relationship between shoe size and height? Why?

-Yes, there is a strong positive relationship between shoe size and height, with a correlation coefficient of approximately 0.82, indicating that taller individuals tend to have larger shoe sizes.

2. Construct character vector months to a factor with factor() and assign the result to factor_months_vector. Print out factor_months_vector and assert that R prints out the factor levels below the actual values.

```r
vect_months <- c("March", "April", "January", "November", "January", "September", "October", "September
factor_months_vector <- factor(vect_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. Then check the summary() of the months_vector and factor_months_vector. | Inter- pret the results of both vectors. Are they both equally useful in this case?

```r
SummaryM <- summary(vect_months)
SummaryF <- summary(factor_months_vector)
SummaryM
```

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

```r
SummaryF
```

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

4. Create a vector and factor for the table below.

```r
Direction <- c("East", "West", "North")
Frequency <- c(1, 4, 3)
directiondf <- data.frame(Direction, Frequency)
direction_order <- factor(Direction, levels = c("East", "West", "North"))
directiondf
```

```
##   Direction Frequency
## 1      East         1
## 2      West         4
## 3     North         3
```

```r
direction_order
```

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

5. Enter the data below in Excel with file name = import_march.csv

a. Import the excel file into the Environment Pane using read.table() function. Write the code.

```r
TableReader <- read.table("import_march.csv", header=TRUE, sep=",")
TableReader
```

```
##   Students Strategy.1 Strategy.2 Strategy.3  X X.1
## 1     Male          8         10          8 NA  NA
## 2                   4          8          6 NA  NA
## 3                   0          6          4 NA  NA
## 4   Female         14          4         15 NA  NA
## 5                  10          2         12 NA  NA
## 6                   6          0          9 NA  NA
```

b. View the dataset. Write the R scripts and its result.

```
print(TableReader)
```

```
##   Students Strategy.1 Strategy.2 Strategy.3  X X.1
## 1     Male          8         10          8 NA  NA
## 2                   4          8          6 NA  NA
## 3                   0          6          4 NA  NA
## 4   Female         14          4         15 NA  NA
## 5                  10          2         12 NA  NA
## 6                   6          0          9 NA  NA
```

6.

a.

```
select_num <- readline(prompt = "Select a number from 1-50: ")
```

```
## Select a number from 1-50:
```

```
select_num
```

```
## [1] ""
```

```
if(select_num <= 1 || select_num >= 50 ) {
  print("The number selected is beyond the range of 1 to 50.")
} else if(select_num == 20) {
  print(""TRUE")
}else {
  print(paste("The Selected Number is: ", select_num))
}
```

```
## [1] "The number selected is beyond the range of 1 to 50."
```

7.

a.

```
min_num <- function(price) {
  bills  <- c(50, 100, 200, 500, 1000)
  count <- 0

  for(bill in bills) {
    if(price >= bill) {
      n <- floor(price / bill)
      count <- count + n
      price <- price %% bill
    }
  }
  return(count)
}

snack_price <- 1350
cat("Minimum numbers of bills needed: ",min_num(snack_price),"\n")
```

```
## Minimum numbers of bills needed:  27
```

8.

a.

```r
scores <- data.frame(
  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)
)

print(scores)
```

```
##   Names....c..Annie....Thea....Steve....Hanna.. Grade1....c.85..65..75..95.
## 1                                        Annie                           85
## 2                                         Thea                           65
## 3                                        Steve                           75
## 4                                        Hanna                           95
##   Grade2....c.65..75..55..75. Grade3....c.85..90..80..100.
## 1                          65                           85
## 2                          75                           90
## 3                          55                           80
## 4                          75                          100
##   Grade4....c.100..90..85..90.
## 1                          100
## 2                           90
## 3                           85
## 4                           90
```

b.

```r
Annie <- (scores$Grade1[1] + scores$Grade2[1] + scores$Grade3[1] + scores$Grade4[1]) / 4
if (Annie > 90) {
  cat("Annie's average grade this semester is", Annie)
}
  Thea <- (scores$Grade1[2] + scores$Grade2[2] + scores$Grade3[2] + scores$Grade4[2]) / 4
if (Thea > 90) {
  cat("Annie's average grade this semester is", Thea)
}
  Steven <- (scores$Grade1[3] + scores$Grade2[3] + scores$Grade3[3] + scores$Grade4[3]) / 4
if (Steven > 90) {
  cat("Annie's average grade this semester is", Steven)
}
  Hanna <- (scores$Grade1[3] + scores$Grade2[3] + scores$Grade3[3] + scores$Grade4[3]) / 4
if (Hanna > 90) {
  cat("Annie's average grade this semester is", Hanna)
}else{
  print("No students exceeds 90")
}
```

```
## [1] "No students exceeds 90"
```

c. Without using the mean function, output as follows for the tests in which the average score was less than 80 out of 4 tests. Example output: The nth test was difficult.

```r
Grade1Average <- sum(scores$Grade1) / 4
if (Grade1Average < 80) {
  cat("The Grade1 test was difficult with an average score of", Grade1Average)
}
```

```
Grade2Average <- sum(scores$Grade2) / 4
if (Grade2Average < 80) {
  cat("The Grade1 test was difficult with an average score of", Grade2Average)
}
```

```
## The Grade1 test was difficult with an average score of 67.5
```

```
Grade3Average <- sum(scores$Grade3) / 4
if (Grade3Average < 80) {
  cat("The Grade1 test was difficult with an average score of", Grade3Average)
}
Grade4Average <- sum(scores$Grade4) / 4
if (Grade4Average < 80) {
  cat("The Grade1 test was difficult with an average score of", Grade4Average)
}
```

d. Without using the max function, output as follows for students whose highest score for a semester exceeds 90 points. Example Output: Annie's highest grade this semester is 95.

```
highestOfAnnie <- scores$Grade1[1]
if (scores$Grade2[1] > highestOfAnnie) highestOfAnnie <- scores$Grade2[1]
if (scores$Grade3[1] > highestOfAnnie) highestOfAnnie <- scores$Grade3[1]
if (scores$Grade4[1] > highestOfAnnie) highestOfAnnie <- scores$Grade4[1]
if (highestOfAnnie > 90) {
   cat("Annie's highest grade this semester is", highestOfAnnie,"\n")
}
```

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

```
highestOfThea <- scores$Grade1[2]
if (scores$Grade2[2] > highestOfThea) highestOfThea <- scores$Grade2[2]
if (scores$Grade3[2] >  highestOfThea)  highestOfThea <- scores$Grade3[2]
if (scores$Grade4[2] >  highestOfThea)  highestOfThea <- scores$Grade4[2]
if ( highestOfThea > 90) {
   cat("Thea's highest grade this semester is",  highestOfThea)
}
highestOfSteve <- scores$Grade1[3]
if (scores$Grade2[3] > highestOfSteve) highestOfSteve <- scores$Grade2[3]
if (scores$Grade3[3] > highestOfSteve) highestOfSteve <- scores$Grade3[3]
if (scores$Grade4[3] > highestOfSteve) highestOfSteve <- scores$Grade4[3]
if (highestOfSteve > 90) {
   cat("Steve's highest grade this semester is", highestOfSteve)
}
highestOfHanna <- scores$Grade1[4]
if (scores$Grade2[4] > highestOfHanna) highestOfHanna <- scores$Grade2[4]
if (scores$Grade3[4] > highestOfHanna) highestOfHanna <- scores$Grade3[4]
if (scores$Grade4[4] > highestOfHanna) highestOfHanna <- scores$Grade4[4]
if (highestOfHanna > 90) {
   cat("Hanna's highest grade this semester is", highestOfHanna)
}
```

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