RWorksheet_Animas#4a

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2024-10-14

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

ShoeSize <- c(6.5,9.0,8.5,8.5,10.5,7.0,9.5,9.0,13.0,7.5,10.5,8.5,12.0,10.5,13.0,11.5,8.5,5.0,10.0,6.5,7
Height <- c(66.0,68.0,64.5,65.0,70.0,64.0,70.0,71.0,72.0,64.0,74.5,67.0,71.0,71.0,77.0,72.0,59.0,62.0,7
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"
Household<-data.frame(ShoeSize,Height,Gender)
names(Household) <-c("Shoe size","Height","Gender")
Household
```

```
##    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. Describe the data.
#The table contains data on shoe sizes, heights, and genders for a group of individuals
```

```
#b.
Males <- subset(Household, Gender == "M", select = c("Shoe size", "Height","Gender"))
Males
```

```
##    Shoe size 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 <- subset(Household, Gender == "F", select = c("Shoe size", "Height","Gender"))
Females
```

```
##    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
## 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
MeanShoe <-mean(ShoeSize)
MeanShoe
```

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

```
MeanHeight <-mean(Height)
MeanHeight
```

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

```
#d
#Yes, there is likely a relationship between shoe size and height.Taller individuals tend to have large
```

```
#2 Construct character vector months to a factor with factor() and assign the result to factor_months_v

months_vector<- c("March","April","January","November","January","September","October","September","Nov
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 Then check the summary() of the months_vector and factor_months_vector. | Inter-pret the results of

SumMonths<-summary(months_vector)
SumMonths
```

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

```
SumFactor<-summary(factor_months_vector)
SumFactor
```

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

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

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

```
DirectFreq <- data.frame(Direction = direction, Frequency = frequency)
DirectFreq
```

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

```
#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.

data <- read.table("import_march.csv", header = TRUE, sep = ",", stringsAsFactors = FALSE)
```

```
#b View the dataset. Write the R scripts and its result.
data <- read.table("import_march.csv", header = TRUE, sep = ",", stringsAsFactors = FALSE)
data
```

```
##   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
#a Create an R Program that allows the User to randomly select numbers from 1 to 50. Then display the c

 SelectedNum <- is.na(as.integer(readline(prompt = "Enter a number between 1 and 50: ")))
```

```
## Enter a number between 1 and 50:
```

```
  if (SelectedNum < 1 || SelectedNum > 50) {
    cat("The number selected is beyond the range of 1 to 50\n")
  } else if (SelectedNum == 20) {
    cat("TRUE\n")
  } else {
    cat("The chosen number is:", SelectedNum, "\n")
  }
```

```
## The chosen number is: TRUE
```

```
#7

#a Write a function that prints the minimum number of bills that must be paid, given the price of the s
minimum_bills <- function(price){
  bills <- c(1000, 500, 200, 100, 50)
  count <- 0

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

  cat("Minimum number of bills needed to purchase a snack:", count, "\n")
}

minimum_bills(2500)
```

```
## Minimum number of bills needed to purchase a snack: 3
```

```
#8
#a. Create a dataframe from the above table. Write the R codes and its output.
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)

Student_grades <- data.frame(Name, Grade1, Grade2, Grade3, Grade4)
Student_grades
```

```
##    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
```

```
#b. Without using the rowMean function, output the average score of students whose average math score o

ave_grades <- apply(Student_grades[,2:5], 1, function(x) sum(x) / length(x) )
ave_grades
```

```
## [1] 83.75 80.00 73.75 90.00
```

```
high_achievers <- Student_grades$Name[ave_grades > 90]
high_achiever_averages <- ave_grades[ave_grades > 90]


for (i in 1:length(ave_grades)) {
  if (ave_grades[i] > 90) {
    cat(Student_grades$Name[i], "'s average grade this semester is ", ave_grades[i], ".\n", sep = "")
  }
}
```

```
#c Without using the mean function, output as follows for the tests in which the average score was less
for (j in 2:5) {
  average_score <- sum(Student_grades[, j]) / nrow(Student_grades)
  if (average_score < 80) {
    cat("The ", names(Student_grades)[j], " test was difficult.\n", sep = "")
  }
}
```

```
## The Grade2 test was difficult.
```

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

for (i in 1:nrow(Student_grades)) {

  Highest_Grade <- sort(as.numeric(Student_grades[i, 2:5]), decreasing = TRUE)[1]
  if (Highest_Grade > 90) {
    cat(Student_grades$Name[i], "'s highest grade this semester is ", Highest_Grade, ".\n", sep = "")
  }
}
```

```
## Annie’s highest grade this semester is 100.
## Hanna’s highest grade this semester is 100.
```