RWorksheet_SABIO#4a.Rmd

2023-10-25

Number 1:

```
install.packages("readxl")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

```
library(readxl)
HouseholdData <- read_excel("Household Data.xlsx")
```

```
## New names:
## * `Height` -> `Height...2`
## * `Gender` -> `Gender...3`
## * `Height` -> `Height...5`
## * `Gender` -> `Gender...6`
```

```
# View(HouseholdData)
HouseholdData
```

```
## # A tibble: 14 x 6
##    `Shoe Size` Height...2 Gender...3 `Shoe size` Height...5 Gender...6
##          <dbl>      <dbl> <chr>            <dbl>      <dbl> <chr>
##  1         6.5         66   F                 13           77 M
##  2         9           68   F                 11.5         72 M
##  3         8.5         64.5 F                  8.5         59 F
##  4         8.5         65   F                  5           62 F
##  5        10.5         70   M                 10           72 M
##  6         7           64   F                  6.5         66 F
##  7         9.5         70   F                  7.5         64 F
##  8         9           71   F                  8.5         67 M
##  9        13           72   M                 10.5         73 M
## 10         7.5         64   F                  8.5         69 F
## 11        10.5         74   M                 10.5         72 M
## 12         8.5         67   F                 11           70 M
## 13        12           71   M                  9           69 M
## 14        10.5         71   M                 13           70 M
```

a.

```
#The data shows the gender,height and shoe size.
```

b.

```
# Create a sample data frame
data <- data.frame(
  Gender = c("F","F","F","F","M", "F","F","F", "M", "F","M","F","M","M", "M","M", "F","F","M","F","F","
)
males <- subset(data, Gender == "M")
males
```

```
##    Gender
## 5       M
## 9       M
## 11      M
## 13      M
## 14      M
## 15      M
## 16      M
## 19      M
## 22      M
## 23      M
## 25      M
## 26      M
## 27      M
## 28      M
```

```
females <- subset(data, Gender == "F")
females
```

```
##    Gender
## 1       F
## 2       F
## 3       F
## 4       F
## 6       F
## 7       F
## 8       F
## 10      F
## 12      F
## 17      F
## 18      F
## 20      F
## 21      F
## 24      F
```

c.

```
mean(HouseholdData$`Shoe Size`)
```

```
## [1] 9.321429
```

```
mean(HouseholdData$Height...2)
```

```
## [1] 68.39286
```

d

```
#yes,because a person with a taller height may have a larger shoe size on average.
```

Number 2:

```
months_vector <- c("March","April","January","November","January",
"September","October","September","November","August",
"January","November","November","February","May","August","July","December","August","August","Septembe
"April")
 factor_months_vector <- factor(months_vector)
print( 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
```

Number 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
```

```
# the result of summary of months_vector it provides information on
#the counts of each month in the character vector it is useful when
#understanding the distribution of month names in original data. In
#factor_months_vector gives you the same information but represented
#as counts of factor levels it is useful when you want to work with
#categorical data and perform operation depend on factor levels.
```

Number 4:

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

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

Numebr 5:

```
student_table <- read.table(file = 'import_march.csv', header = TRUE, sep = ',')
student_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
```

Number 6:

```
num <- readline(prompt="Enter a number from 1 to 50: ")
```

```
## Enter a number from 1 to 50:
```

```
if (num >= 1 && num <= 50) {
  if (user_input == 20) {
    print("TRUE")
  } else {
    print(user_input)
  }
```

```
} else {
  print("The number selected is beyond the range of 1 to 50")
}
```

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

Number 7:

```
calcMin_Bills<- function(){
  price<- as.integer(readline(prompt = "Price of snack(a random number divicible by 50):"))

  if (is.na(price)||price %% 50!=0){
    cat("Invalid input.Please enter a valid price divisible by 50.\n")
    return()
  }

  numBills<- 0
  bill<- c(1000,500,200,100,50)

  for(bill in bill){
    numBills<-numBills+(price %% bill)
    price<- price%%bill
  }
  cat("Minimum number of bills needed:",numBills,"\n")
}

calcMin_Bills()
```

```
## Price of snack(a random number divicible by 50):
## Invalid input.Please enter a valid price divisible by 50.
```

```
## NULL
```

Number 8:

```
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(95,75,100,90)
card<- data.frame(name,grade1,grade2,grade3,grade4)
card
```

```
##    name grade1 grade2 grade3 grade4
## 1 Annie     85     65     85     95
## 2  Thea     65     75     90     75
## 3 Steve     75     55     80    100
## 4 Hanna     95     75    100     90
```

b

```
for (i in 1:length(name)) {
  averageScore <- (grade1[i] + grade2[i] + grade3[i] + grade4[i]) / 4
  cat(paste(name[i], "'s average grade this semester is ", round(averageScore, 2), ".\n"))
}
```

```
## Annie 's average grade this semester is  82.5 .
## Thea 's average grade this semester is  76.25 .
```

```
## Steve 's average grade this semester is  77.5 .
## Hanna 's average grade this semester is  90 .
```

c

```
for (testNum in 1:4){
  totalScore<- grade1 + grade2 + grade3 + grade4
  averageScore<- totalScore/4

if (averageScore[testNum]<80){
  cat("The",testNum,"test was difficult.\n")
}
}
```

```
## The 2 test was difficult.
## The 3 test was difficult.
```

d

```
for (i in 1:length(name)){
  highestGrade<- grade1[i]

  if (grade2[i]>highestGrade){
    highestGrade<- grade2[i]
  }
  if (grade3[i]>highestGrade){
    highestGrade<- grade3[i]
  }
  if (grade4[i]>highestGrade){
    highestGrade<- grade4[i]
  }
  if (highestGrade>90){
    cat(paste(name[i],"'s higest grade this semester is", highestGrade, ".\n"))
  }
}
```

```
## Annie 's higest grade this semester is 95 .
## Steve 's higest grade this semester is 100 .
## Hanna 's higest grade this semester is 100 .
```