RWorksheet_Salinas#4a

Reysha Marie S. Salinas

2023-10-25

```
#1. The table below shows the data about shoe size and height. Create a 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
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","M","F","F","M","M"

# Create a data frame
data <- data.frame(ShoeSize = shoe_size, Height = height, Gender = gender)

#a. Describe the data.
summary(data)
```

```
##     ShoeSize         Height         Gender
##  Min.   : 5.000   Min.   :59.00   Length:28
##  1st Qu.: 8.500   1st Qu.:65.75   Class :character
##  Median : 9.000   Median :69.50   Mode  :character
##  Mean   : 9.411   Mean   :68.57
##  3rd Qu.:10.500   3rd Qu.:71.25
##  Max.   :13.000   Max.   :77.00
```

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

males <- data[data$Gender == "M", c("Gender","ShoeSize", "Height")]
females <- data[data$Gender == "F", c("Gender", "ShoeSize", "Height")]

males
```

```
##    Gender ShoeSize 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
```

```
females
```

```
##    Gender ShoeSize 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
```

```
#c. Find the mean of shoe size and height of the respondents. Write the R scripts and it result.
mean_shoe_size <- mean(data$ShoeSize)
mean_height <- mean(data$Height)

mean_shoe_size
```

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

```
mean_height
```

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

```
#d. Is there a relationship between shoe size and height? Why?
#No, Both shoe size and height can change over a person's lifetime.
correlation <- cor(data$ShoeSize, data$Height)
correlation
```

```
## [1] 0.7766089
```

```
#2. Create a character vector of months
months <- c(
  "March", "April", "January", "November", "January",
  "September", "October", "September", "November", "August",
  "January", "November", "November", "February", "May", "August",
  "July", "December", "August", "August", "September", "November", "February", "April"
)

    factor_months_vector <- factor(months)

    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
```

```
   levels(factor_months_vector)
```

```
##  [1] "April"     "August"    "December"  "February"  "January"   "July"
```

```
##  [7] "March"     "May"       "November"  "October"   "September"
```

```
#3 summary

    # character vector
    #for numerical analysis
    summary(months)
```

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

```
    # the factor
    # for categorical analysis
    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 Create a vector and factor

    direction_vector <- c("north", "east", "west")
    frequency_vector <- c(1, 4, 3)

    factor_data <- factor(direction_vector, levels = c("east", "west", "north"),  c(1, 4, 3))
    print(factor_data)
```

```
## [1] 3 1 4
## Levels: 1 4 3
```

```
#5  A Import the excel

     library(readr)
     import_march <- read_csv("import_march.csv")
```

```
## Rows: 6 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (1): Students
## dbl (3): Strategy 1, Strategy 2, Strategy 3
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
#5  B.View the dataset
     head(import_march)
```

```
## # A tibble: 6 x 4
##   Students `Strategy 1` `Strategy 2` `Strategy 3`
##   <chr>           <dbl>        <dbl>        <dbl>
## 1 Male                8           10            8
## 2 <NA>                4            8            6
## 3 <NA>                0            6            4
## 4 Female             14            4           15
## 5 <NA>               10            2           12
## 6 <NA>                6            0            9
```

```r
#6 Full Search
   num <- readline(prompt= "Enter number from 1 to 50:")
```

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

```r
    paste("Your entered number is ", num)
```

```
## [1] "Your entered number is  "
```

```r
    if(num == 50) {
      paste("The number you selected is beyond the range of 1 to 50")
    } else if (num <= 50){
      paste("TRUE")
    } else {
      paste(num)
    }
```

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

```r
#7 Change
     minimum <- function (price) {

    bill <- price%/% 50
    paste("The  minimum number of bills:", bill)
    }
     snackprice <- 250
     minimum(snackprice)
```

```
## [1] "The  minimum number of bills: 5"
```

```r
#8 A. Create a dataframe

     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)

     mathgrades <- data.frame(name, grade1, grade2, grade3, grade4)
     print(mathgrades)
```

```
##    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
```

```r
#8 B. the average score of students whose average math score over 90 points during the semester.

     mathgrades <- 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)
     )
```

```
    print(mathgrades)
```

```
##    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
```

```
    mathgrades$average <- (mathgrades$grade1 + mathgrades$grade2 + mathgrades$grade3 + mathgrades$grad

    top <- mathgrades[mathgrades$average >= 90,]
    top
```

```
##    name grade1 grade2 grade3 grade4 average
## 4 Hanna     95     75    100     90      90
```

```
    if (nrow(top) > 0) {
      paste(top$name, "'s average grade this semester is", top$average)
    } else {
      paste("No students have an average math score over 90.")
    }
```

```
## [1] "Hanna 's average grade this semester is 90"
```

```
#8 C. the average score was less than 80 out of 4 tests.

    test1 <- sum(mathgrades$grade1) / nrow(mathgrades)
    test1
```

```
## [1] 80
```

```
    test2 <- sum(mathgrades$grade2) / nrow(mathgrades)
    test2
```

```
## [1] 67.5
```

```
    test3 <- sum(mathgrades$grade3) / nrow(mathgrades)
    test3
```

```
## [1] 88.75
```

```
    test4 <- sum(mathgrades$grade4) / nrow(mathgrades)
    test4
```

```
## [1] 91.25
```

```
     if (test1 < 80) {
      paste("The 1st test was difficult")
    } else if (test2 < 80) {
      paste("The 2nd test was difficult")
    } else if (test3 < 80) {
      paste("The 3rd test was difficult")
    } else if (test4 < 80) {
      paste("The 4th test was difficult")
    } else {
      paste("No test had an average grade less than 80")
    }
```

```
## [1] "The 2nd test was difficult"
```

```r
#8 D.students whose highest score for a semester exceeds 90 points.
     # annie scores
if (mathgrades[1,2] > mathgrades[1,3] && mathgrades[1,2] > mathgrades[1,4] && mathgrades[1,2] > mathgrad
  annie <- mathgrades[1,2]
} else if (mathgrades[1,3] > mathgrades[1,4] && mathgrades[1,3] > mathgrades[1,5]) {
  annie <- mathgrades[1,3]
} else if (mathgrades[1,4] > mathgrades[1,5] && mathgrades[1,2] > mathgrades[1,5]) {
  annie <- mathgrades[1,4]
} else {
  annie <- mathgrades[1,5]
}


# thea scores
if (mathgrades[2,2] > mathgrades[2,3] && mathgrades[2,2] > mathgrades[2,4] && mathgrades[2,2] > mathgrad
  thea <- mathgrades[2,2]
} else if (mathgrades[2,3] > mathgrades[2,4] && mathgrades[2,3] > mathgrades[2,5]) {
  thea <- mathgrades[2,3]
} else if (mathgrades[2,4] > mathgrades[2,5] && mathgrades[2,2] > mathgrades[2,5]) {
  thea <- mathgrades[2,4]
} else {
  thea <- mathgrades[2,5]
}

# steve scores
if (mathgrades[3,2] > mathgrades[3,3] && mathgrades[3,2] > mathgrades[3,4] && mathgrades[3,2] > mathgrad
  steve <- mathgrades[3,2]
} else if (mathgrades[3,3] > mathgrades[3,4] && mathgrades[3,3] > mathgrades[3,5]) {
  steve <- mathgrades[3,3]
} else if (mathgrades[3,4] > mathgrades[3,5] && mathgrades[3,2] > mathgrades[3,5]) {
  steve <- mathgrades[3,4]
} else {
  steve <- mathgrades[3,5]
}

# hanna scores
if (mathgrades[4,2] > mathgrades[4,3] && mathgrades[4,2] > mathgrades[4,4] && mathgrades[4,2] > mathgrad
  hanna <- mathgrades[4,2]
} else if (mathgrades[4,3] > mathgrades[4,4] && mathgrades[4,3] > mathgrades[4,5]) {
  hanna <- mathgrades[4,3]
} else if (mathgrades[4,4] > mathgrades[4,5] && mathgrades[4,2] > mathgrades[4,5]) {
  hanna <- mathgrades[4,4]
} else {
  hanna <- mathgrades[4,5]
}

mathgrades$highest <- c(annie, thea, steve, hanna)


abovegradeof90 <- mathgrades[mathgrades$highest >= 90,]


if (nrow(abovegradeof90) > 0) {
```

```
  paste(abovegradeof90$name, "'s highest grade this semester is", abovegradeof90$highest)
} else {
  paste("No students have an average math score over 90.")
}
```

```
## [1] "Annie 's highest grade this semester is 100"
## [2] "Thea 's highest grade this semester is 90"
## [3] "Hanna 's highest grade this semester is 100"
```