RWorksheet_lauron#4a.Rmd

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2025-11-03

```
# Create the data frame
Shoes_height <- 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,
                8.5, 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)
)
Shoes_height
```

```
##    Shoe_size Height
## 1        6.5   66.0
## 2        9.0   68.0
## 3        8.5   64.5
## 4        8.5   65.0
## 5       10.5   70.0
## 6        7.0   64.0
## 7        9.5   70.0
## 8        9.0   71.0
## 9       13.0   72.0
## 10       7.5   64.0
## 11      10.5   74.5
## 12       8.5   67.0
## 13      12.0   71.0
## 14      10.5   71.0
## 15      13.0   77.0
## 16      11.5   72.0
## 17       8.5   59.0
## 18       5.0   62.0
## 19      10.0   72.0
## 20       6.5   66.0
## 21       7.5   64.0
## 22       8.5   67.0
## 23      10.5   73.0
## 24       8.5   69.0
## 25      10.5   72.0
## 26      11.0   70.0
## 27       9.0   69.0
## 28      13.0   70.0
```

```r
#output
#Shoe_size Height
#1         6.5   66.0
#2         9.0   68.0
#3         8.5   64.5
#4         8.5   65.0
#5        10.5   70.0
#6         7.0   64.0
#7         9.5   70.0
#8         9.0   71.0
#9        13.0   72.0
#10        7.5   64.0
#11       10.5   74.5
#12        8.5   67.0
#13       12.0   71.0
#14       10.5   71.0
#15       13.0   77.0
#16       11.5   72.0
#17        8.5   59.0
#18        5.0   62.0
#19       10.0   72.0
#20        6.5   66.0
#21        7.5   64.0
#22        8.5   67.0
#23       10.5   73.0
#24        8.5   69.0
#25       10.5   72.0
#26       11.0   70.0
#27        9.0   69.0
#28       13.0   70.0
#decribe the data: The data frame with a vector name Shoes_height has two variables shoe_size and heigh

#1b Create subsets for male and female
Shoes_height$Gender <- c(rep("M", 14), rep("F", 14))
male_subset <- Shoes_height[Shoes_height$Gender == "M", ]
female_subset <- Shoes_height[Shoes_height$Gender == "F", ]

# Display results
male_subset
```

```
##    Shoe_size Height Gender
## 1        6.5   66.0      M
## 2        9.0   68.0      M
## 3        8.5   64.5      M
## 4        8.5   65.0      M
## 5       10.5   70.0      M
## 6        7.0   64.0      M
## 7        9.5   70.0      M
## 8        9.0   71.0      M
## 9       13.0   72.0      M
## 10       7.5   64.0      M
## 11      10.5   74.5      M
## 12       8.5   67.0      M
## 13      12.0   71.0      M
```

```
## 14      10.5   71.0      M
```

```
female_subset
```

```
##    Shoe_size Height Gender
## 15      13.0     77      F
## 16      11.5     72      F
## 17       8.5     59      F
## 18       5.0     62      F
## 19      10.0     72      F
## 20       6.5     66      F
## 21       7.5     64      F
## 22       8.5     67      F
## 23      10.5     73      F
## 24       8.5     69      F
## 25      10.5     72      F
## 26      11.0     70      F
## 27       9.0     69      F
## 28      13.0     70      F
```

```
#male_subset
#Shoe_size Height Gender
#1        6.5   66.0      M
#2        9.0   68.0      M
#3        8.5   64.5      M
#4        8.5   65.0      M
#5       10.5   70.0      M
#6        7.0   64.0      M
#7        9.5   70.0      M
#8        9.0   71.0      M
#9       13.0   72.0      M
#10       7.5   64.0      M
#11      10.5   74.5      M
#12       8.5   67.0      M
#13      12.0   71.0      M
#14      10.5   71.0      M
# female_subset
#Shoe_size Height Gender
#15      13.0     77      F
#16      11.5     72      F
#17       8.5     59      F
#18       5.0     62      F
#19      10.0     72      F
#20       6.5     66      F
#21       7.5     64      F
#22       8.5     67      F
#23      10.5     73      F
#24       8.5     69      F
#25      10.5     72      F
#26      11.0     70      F
#27       9.0     69      F
#28      13.0     70      F

#1c mean of shoe size and height
mean(Shoes_height$Shoe_size)
```

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

```
mean(Shoes_height$Height)
```

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

```
#output
#[1] 9.410714 - shoe_size
#[1] 68.57143 - height

#1d is there a relationship between shoe size and height
#Yes there is, because the data shows that mostly the taller their height the longer shoe size but some

#2
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)
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
```

```
#output
#[1] March     April     January   November  January   September October   September
#[9] November  August    January   November  November  February  May       August
#[17] July      December  August    August    September November  February  April
#11 Levels: April August December February January July March May November ... September

#3 Check summary of months and factor_months_vector
summary(months)
```

```
##    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
```

```
#summary(months)
#  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

#interpretation: months vector only gives the length, class and the mode while the factor_months_vector
```

```r
#4
direction <- c("East", "West", "North")
factor_direction <- factor(direction)
factor_direction
```

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

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

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

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

#5
import_march <- read.table("/cloud/project/import_march.csv", header = TRUE, sep = ",")
print(import_march)
```

```
##   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
```

```r
#result
#   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
num <- as.numeric(readline(prompt = "Select a number from 1 to 50: "))
```

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

```r
if (is.na(num)) {
  cat("Invalid input. Please enter a number.\n")
} else if (num < 1 || num > 50) {
  cat("The number selected is beyond the range of 1 to 50\n")
} else if (num == 20) {
  cat("TRUE\n")
} else {
  cat("You selected number:", num, "\n")
}
```

```
## Invalid input. Please enter a number.
```

```
#output
#Select a number from 1 to 50: 23
#You selected number: 23

#7
min_bills <- function(price) {

  if (price %% 50 != 0) {
    cat("The price must be divisible by 50.\n")
    return(NULL)
  }

  bills <- c(50,100,200,500,1000)
  count <- 0

  remaining <- price

  for (bill in bills) {
    num_bills <- remaining %/% bill
    remaining <- remaining %% bill
    count <- count + num_bills
  }

  cat("The minimum number of bills needed to purchase:", count, "\n")
}


price <- sample(seq(50, 5000, 50), 1)
cat("Price of snack:", price, "\n")
```

```
## Price of snack: 4450
```

```
min_bills(price)
```

```
## The minimum number of bills needed to purchase: 89
```

```
#output
#Price of snack: 600
#The minimum number of bills needed is: 12

#8
#8a
students <- 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(students)
```

```
##    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
```

```
#output
#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


#8b
for (i in 1:nrow(students)) {
  avg <- (students$Grade1[i] + students$Grade2[i] + students$Grade3[i] + students$Grade4[i]) / 4
  cat(students$Name[i], "'s average grade this semester is", avg, "\n")
}
```

```
## Annie 's average grade this semester is 83.75
## Thea 's average grade this semester is 80
## Steve 's average grade this semester is 73.75
## Hanna 's average grade this semester is 90
```

```
#output
#Annie 's average grade this semester is 83.75
#Thea 's average grade this semester is 80
#Steve 's average grade this semester is 73.75
#Hanna 's average grade this semester is 90

#8c
grades_only <- students[, 2:5]

for (i in 1:ncol(grades_only)) {
  test_avg <- sum(grades_only[, i]) / nrow(grades_only)
  if (test_avg < 80) {
    cat("The", i, "th test was difficult.\n")
  }
}
```

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

```
#output
#The 2th test was difficult.

#8d
for (i in 1:nrow(students)) {
  highest <- students[i, 2]
  for (j in 3:5) {
    if (students[i, j] > highest) {
      highest <- students[i, j]
    }
  }
  if (highest > 90) {
    cat(students$Name[i], "'s highest grade this semester is", highest, "\n")
  }
}
```

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

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

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