Untitled

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#1a

```
# The dataset contains shoe size, height, and gender of respondents.
```

#1b

```
df <- 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,
               13.0,11.5,8.5,5.0,10.0,6.5,7.5,8.5,10.5,11.0,9.0,13.0),
  Height = c(66.0,68.0,64.5,65.0,70.0,64.0,70.5,71.0,72.0,64.0,74.5,67.0,71.0,71.0,
             77.0,72.0,59.0,62.0,72.0,66.0,64.0,67.0,73.0,72.0,69.0,70.0),
  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","F","M","M")
)


male_df <- subset(df, Gender == "M")
female_df <- subset(df, Gender == "F")

male_df
```

```
##    ShoeSize 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      9.0   69.0      M
## 26     13.0   70.0      M
```

```
female_df
```

```
##    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   70.5      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     11.0   72.0      F
```

#1c

```
mean_shoe <- mean(df$ShoeSize)
mean_height <- mean(df$Height)

mean_shoe
```

```
## [1] 9.403846
```

```
mean_height
```

```
## [1] 68.51923
```

#1d

```
# Yes. There appears to be a positive relationship between shoe size and height.

cor(df$ShoeSize, df$Height)
```

```
## [1] 0.7835595
```

#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
```

#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
```

```
#The character vector's summary shows only its type and length, giving little insight. The factor's sum
```

#4

```
direction_data <- c("East", "West", "North")

frequency_data <- c(1, 4, 3)

factor_data <- factor(direction_data,
                      levels = c("East", "West", "North"))

print(direction_data)
```

```
## [1] "East"  "West"  "North"
```

```
print(frequency_data)
```

```
## [1] 1 4 3
```

```
print(factor_data)
```

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

#5a&b

```
import_march <- read.csv("import_march.csv")

head(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
```

#6a

```
if (interactive()) {
  mode <- tolower(trimws(readline("Enter mode ('r' for random, 'm' for manual): ")))
} else {
  mode <- "r"
}

if (mode == "r") {
  chosen <- sample(1:50, 1)
  cat("Randomly chosen number:", chosen, "\n")
} else if (mode == "m") {
  if (interactive()) {
    input <- readline("Enter an integer: ")
    chosen_num <- suppressWarnings(as.integer(input))
    if (is.na(chosen_num)) stop("Invalid input: please enter an integer.")
    chosen <- chosen_num
  } else {
    chosen <- 20
```

```
    cat("Default number selected for knitting:", chosen, "\n")
  }
} else {
  stop("Invalid mode. Use 'r' or 'm'.")
}
```

```
## Randomly chosen number: 34
```

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

```
## Selected number: 34
```

#7

```
min_bills <- function(price) {

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

  count <- 0
  remaining <- price

  for (b in bills) {
    num <- remaining %/% b
    count <- count + num
    remaining <- remaining %% b
  }

  cat("Minimum number of bills needed:", count, "\n")
}

min_bills(700)
```

```
## Minimum number of bills needed: 2
```

#8a

```
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)

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

```
##    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

```r
for (i in 1:nrow(df)) {
  total <- df$Grade1[i] + df$Grade2[i] + df$Grade3[i] + df$Grade4[i]
  avg <- total / 4

  if (avg > 90) {
    cat(df$Name[i], "'s average grade this semester is ", avg, ".\n", sep="")
  }
}
```

#8c

```r
grades <- df[, 2:5]

for (j in 1:ncol(grades)) {
  total <- 0
  for (i in 1:nrow(grades)) {
    total <- total + grades[i, j]
  }
  avg <- total / nrow(grades)

  if (avg < 80) {
    cat("The", j, "th test was difficult.\n")
  }
}
```

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

#8d

```r
for (i in 1:nrow(df)) {
  highest <- df$Grade1[i]

  if (df$Grade2[i] > highest) highest <- df$Grade2[i]
  if (df$Grade3[i] > highest) highest <- df$Grade3[i]
  if (df$Grade4[i] > highest) highest <- df$Grade4[i]

  if (highest > 90) {
    cat(df$Name[i], "'s highest grade this semester is ", highest, ".\n", sep="")
  }
}
```

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