```r
#1. A.
Gender <- c("M","F","F","M","M","F")
ShoeSize <- c(8,6,7,9,10,6)
Height <- c(170,160,165,175,180,158)

df <- data.frame(Gender, ShoeSize, Height)
df
```

```
##   Gender ShoeSize Height
## 1      M        8    170
## 2      F        6    160
## 3      F        7    165
## 4      M        9    175
## 5      M       10    180
## 6      F        6    158
```

```r
#1. B.
males <- subset(df, Gender == "M")
females <- subset(df, Gender == "F")

males
```

```
##   Gender ShoeSize Height
## 1      M        8    170
## 4      M        9    175
## 5      M       10    180
```

```r
females
```

```
##   Gender ShoeSize Height
## 2      F        6    160
## 3      F        7    165
## 6      F        6    158
```

```r
#1. C.
mean(df$ShoeSize)
```

```
## [1] 7.666667
```

```r
mean(df$Height)
```

```
## [1] 168
```

```r
#2.
months_vector <- 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_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.
```
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
```

#4.
```
factor_data <- c("East","West","West","West","West","North","North","North")

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

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

#6.
```
search_number <- function(n) {
  if (n < 1 || n > 50) {
    print("The number selected is beyond the range of 1 to 50")
  } else if (n == 20) {
    print(TRUE)
  } else {
    print(n)
  }
}

search_number(sample(1:60, 1))
```

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

```
#7.
min_bills <- function(price) {
  bills <- c(1000, 500, 200, 100, 50)
  count <- 0

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

  count
}

min_bills(1350)
```

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

```
#8. A.
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)
)

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
```

```
#8. B.
for (i in 1:nrow(students)) {
  avg <- (students[i,2] + students[i,3] + students[i,4] + students[i,5]) / 4
  if (avg > 90) {
    cat(students$Name[i], "average grade this semester is", avg, "\n")
  }
}
```

```
#8. C.
for (j in 2:5) {
  avg <- (students[1,j] + students[2,j] + students[3,j] + students[4,j]) / 4
  if (avg < 80) {
    cat("The", j-1, "th test was difficult\n")
  }
}
```

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

```
#8. D.
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], "highest grade this semester is", highest, "\n")
  }
}
```

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