Worksheet-3b in R

Michael T. Simpron

2025-10-13

##1.

```
##a)
df <- data.frame(
  Respondents = 1:20,
  Sex = c(2,2,1,2,2,2,2,2,2,2,1,2,2,2,2,2,2,2,1,2),
  Fathers_Occupation = c(1,3,3,3,1,2,3,1,1,1,3,2,1,3,3,1,3,1,2,1),
  Persons_at_Home = c(5,7,3,8,5,9,6,7,8,4,7,5,4,7,8,8,3,11,7,6),
  Siblings_at_School = c(6,4,4,1,2,1,5,3,1,2,3,2,5,5,2,1,2,5,3,2),
  Types_of_Houses = c(1,2,3,1,1,3,3,1,2,3,2,3,2,2,3,3,3,3,3,2)
)

print(df)
```

```
##    Respondents Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 1            1   2                  1               5                  6
## 2            2   2                  3               7                  4
## 3            3   1                  3               3                  4
## 4            4   2                  3               8                  1
## 5            5   2                  1               5                  2
## 6            6   2                  2               9                  1
## 7            7   2                  3               6                  5
## 8            8   2                  1               7                  3
## 9            9   2                  1               8                  1
## 10          10   2                  1               4                  2
## 11          11   1                  3               7                  3
## 12          12   2                  2               5                  2
## 13          13   2                  1               4                  5
## 14          14   2                  3               7                  5
## 15          15   2                  3               8                  2
## 16          16   2                  1               8                  1
## 17          17   2                  3               3                  2
## 18          18   2                  1              11                  5
## 19          19   1                  2               7                  3
## 20          20   2                  1               6                  2
##    Types_of_Houses
## 1                1
## 2                2
## 3                3
## 4                1
## 5                1
```

```
## 6                3
## 7                3
## 8                1
## 9                2
## 10               3
## 11               2
## 12               3
## 13               2
## 14               2
## 15               3
## 16               3
## 17               3
## 18               3
## 19               3
## 20               2
```

```
##b)
str(df)
```

```
## 'data.frame':    20 obs. of  6 variables:
##  $ Respondents       : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Sex               : num  2 2 1 2 2 2 2 2 2 2 ...
##  $ Fathers_Occupation: num  1 3 3 3 1 2 3 1 1 1 ...
##  $ Persons_at_Home   : num  5 7 3 8 5 9 6 7 8 4 ...
##  $ Siblings_at_School: num  6 4 4 1 2 1 5 3 1 2 ...
##  $ Types_of_Houses   : num  1 2 3 1 1 3 3 1 2 3 ...
```

```
summary(df)
```

```
##   Respondents          Sex       Fathers_Occupation Persons_at_Home
##  Min.   : 1.00   Min.   :1.00   Min.   :1.00       Min.   : 3.0
##  1st Qu.: 5.75   1st Qu.:2.00   1st Qu.:1.00       1st Qu.: 5.0
##  Median :10.50   Median :2.00   Median :2.00       Median : 7.0
##  Mean   :10.50   Mean   :1.85   Mean   :1.95       Mean   : 6.4
##  3rd Qu.:15.25   3rd Qu.:2.00   3rd Qu.:3.00       3rd Qu.: 8.0
##  Max.   :20.00   Max.   :2.00   Max.   :3.00       Max.   :11.0
##  Siblings_at_School Types_of_Houses
##  Min.   :1.00       Min.   :1.0
##  1st Qu.:2.00       1st Qu.:2.0
##  Median :2.50       Median :2.5
##  Mean   :2.95       Mean   :2.3
##  3rd Qu.:4.25       3rd Qu.:3.0
##  Max.   :6.00       Max.   :3.0
```

```
##c)
mean_siblings <- mean(df$Siblings_at_School)

mean_siblings
```

```
## [1] 2.95
```

```r
mean_siblings == 5
```

```
## [1] FALSE
```

```r
##d)
df[1:2, ]
```

```
##   Respondents Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 1           1   2                  1               5                  6
## 2           2   2                  3               7                  4
##   Types_of_Houses
## 1               1
## 2               2
```

```r
##e)
df[c(3,5), c(2,4)]
```

```
##   Sex Persons_at_Home
## 3   1               3
## 5   2               5
```

```r
##f)
types_houses <- df$Types_of_Houses
types_houses
```

```
##  [1] 1 2 3 1 1 3 3 1 2 3 2 3 2 2 3 3 3 3 3 2
```

```r
##g)
subset(df, Sex == 1 & Fathers_Occupation == 1)
```

```
## [1] Respondents        Sex                Fathers_Occupation Persons_at_Home
## [5] Siblings_at_School Types_of_Houses
## <0 rows> (or 0-length row.names)
```

```r
##h)
subset(df, Sex == 2 & Siblings_at_School >= 5)
```

```
##    Respondents Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 1            1   2                  1               5                  6
## 7            7   2                  3               6                  5
## 13          13   2                  1               4                  5
## 14          14   2                  3               7                  5
## 18          18   2                  1              11                  5
##    Types_of_Houses
## 1                1
## 7                3
## 13               2
## 14               2
## 18               3
```

##2.

```r
df = data.frame(Ints=integer(),

Doubles=double(), Characters=character(),
Logicals=logical(),
Factors=factor(),
stringsAsFactors=FALSE)

print("Structure of the empty dataframe:")
```

```
## [1] "Structure of the empty dataframe:"
```

```r
print(str(df))
```

```
## 'data.frame':    0 obs. of  5 variables:
##  $ Ints      : int
##  $ Doubles   : num
##  $ Characters: chr
##  $ Logicals  : logi
##  $ Factors   : Factor w/ 0 levels:
## NULL
```

```r
##a)
#The data frame is defined but empty - it has 0 rows and 5 columns with various data types.
#This kind of structure is useful when you want to initialize a data frame first and then add rows to i
```

##3.

```r
HouseholdData <- data.frame(
  Respondents = 1:10,
  Sex = c("Male", "Female", "Female", "Male", "Male", "Female", "Female", "Male", "Female", "Male"),
  Fathers_Occupation = c(1, 2, 3, 3, 1, 2, 2, 1, 1, 3),
  Persons_at_Home = c(5, 7, 3, 8, 6, 4, 4, 2, 11, 6),
  Siblings_at_School = c(2, 3, 0, 5, 2, 3, 1, 2, 6, 2),
  Types_of_Houses = c("Wood", "Concrete", "Concrete", "Wood", "Semi-concrete",
                      "Semi-concrete", "Wood", "Semi-concrete", "Semi-concrete", "Concrete")
)

print(HouseholdData)
```

```
##    Respondents    Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 1            1   Male                 1              5                 2
## 2            2 Female                 2              7                 3
## 3            3 Female                 3              3                 0
## 4            4   Male                 3              8                 5
## 5            5   Male                 1              6                 2
## 6            6 Female                 2              4                 3
## 7            7 Female                 2              4                 1
## 8            8   Male                 1              2                 2
## 9            9 Female                 1             11                 6
## 10          10   Male                 3              6                 2
##    Types_of_Houses
```

```
## 1             Wood
## 2         Concrete
## 3         Concrete
## 4             Wood
## 5    Semi-concrete
## 6    Semi-concrete
## 7             Wood
## 8    Semi-concrete
## 9    Semi-concrete
## 10        Concrete
```

```r
write.csv(HouseholdData, file = "HouseholdData.csv", row.names = FALSE)
```

```r
##a)
data <- read.csv("HouseholdData.csv")

print(data)
```

```
##    Respondents    Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 1            1   Male                  1               5                  2
## 2            2 Female                  2               7                  3
## 3            3 Female                  3               3                  0
## 4            4   Male                  3               8                  5
## 5            5   Male                  1               6                  2
## 6            6 Female                  2               4                  3
## 7            7 Female                  2               4                  1
## 8            8   Male                  1               2                  2
## 9            9 Female                  1              11                  6
## 10          10   Male                  3               6                  2
##    Types_of_Houses
## 1             Wood
## 2         Concrete
## 3         Concrete
## 4             Wood
## 5    Semi-concrete
## 6    Semi-concrete
## 7             Wood
## 8    Semi-concrete
## 9    Semi-concrete
## 10        Concrete
```

```r
##b)
data$Sex <- factor(data$Sex, levels = c("Male", "Female"), labels = c(1, 2))
data$Sex <- as.integer(as.character(data$Sex))
print(data$Sex)
```

```
##  [1] 1 2 2 1 1 2 2 1 2 1
```

```r
##c)
colnames(data)[colnames(data) == "Types_of_Houses"] <- "Types_of_Houses"
data$Types_of_Houses <- factor(data$Types_of_Houses,
                               levels = c("Wood", "Concrete", "Semi-concrete"),
```

```
                                  labels = c(1, 2, 3))
data$Types_of_Houses <- as.integer(as.character(data$Types_of_Houses))
print(data$Types_of_Houses)
```

```
##  [1] 1 2 2 1 3 3 1 3 3 2
```

```
##d)
data$Fathers_Occupation <- factor(data$Fathers_Occupation,
                                  levels = c(1, 2, 3),
                                  labels = c(1, 2, 3))
data$Fathers_Occupation <- as.integer(as.character(data$Fathers_Occupation))
print(data$Fathers_Occupation)
```

```
##  [1] 1 2 3 3 1 2 2 1 1 3
```

```
##e)
female_driver <- subset(data, Sex == 2 & Fathers_Occupation == 2)
print(female_driver)
```

```
##   Respondents Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 2           2   2                  2              7                  3
## 6           6   2                  2              4                  3
## 7           7   2                  2              4                  1
##   Types_of_Houses
## 2               2
## 6               3
## 7               1
```

```
##f)
siblings_5_or_more <- subset(data, Siblings_at_School >= 5)
print(siblings_5_or_more)
```

```
##   Respondents Sex Fathers_Occupation Persons_at_Home Siblings_at_School
## 4           4   1                  3              8                  5
## 9           9   2                  1             11                  6
##   Types_of_Houses
## 4               1
## 9               3
```

##4.

```
#The bar chart illustrates the daily distribution of tweet sentiments Negative, Neutral, and Positive a
```