

Weixuan__Chen_hw2

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Question 1

1

```
my_mean <- function(x){  
  sum <- 0  
  size <- length(x)  
  for(value in x){  
    sum <- sum + value  
  }  
  
  return(sum/size)  
}
```

2

```
is_greater <- function(x){  
  if (length(x) == 4){  
    if (x[1] + x[2] > x[3] + x[4]){  
      return(x)  
    }  
    else{  
      return(0)  
    }  
  }  
  else{  
    return(0)  
  }  
}
```

3

```
my_fibonacci <- function(n){  
  if(n == 1){  
    return(c(1))  
  }  
}
```

```

else if(n == 2){
  return(c(1,1))
}
else{
  fib <- c(1,1)
  size <- 2
  while (size < n) {
    fib[size + 1] <- fib[size - 1] + fib[size]
    size <- size + 1
  }

  return(fib)
}
}

```

4

```

m <- matrix(data = 1:16, nrow = 4, ncol = 4, byrow = TRUE)
m

```

```

##      [,1] [,2] [,3] [,4]
## [1,]    1    2    3    4
## [2,]    5    6    7    8
## [3,]    9   10   11   12
## [4,]   13   14   15   16

```

```

apply_m <- apply(m, 1, my_mean)
apply_m

```

```

## [1]  2.5  6.5 10.5 14.5

```

Question 2

1

```

max_wind_ozone <- aggregate(cbind(Wind, Ozone) ~ Month, data = airquality, "max")
max_wind_ozone

```

```

##   Month Wind Ozone
## 1     5 20.1  115
## 2     6 20.7   71
## 3     7 14.9  135
## 4     8 15.5  168
## 5     9 16.6   96

```

2

```

authors <- data.frame(surname = c("Tukey", "Venables", "Tierney", "Ripley", "McNeil"),
  nationality = c("US", "Australia", "US", "UK", "Australia"), stringsAsFactors = FALSE)

books <- data.frame(name = c("Tukey", "Venables", "Tierney", "Ripley", "Ripley",
  "McNeil", "R Core"), title = c("Exploratory Data Analysis", "Modern Applied Statistics ...",
  "LISP-STAT", "Spatial Statistics", "Stochastic Simulation", "Interactive Data Analysis",
  "An Introduction to R"), stringsAsFactors = FALSE)

merge.data.frame(authors, books, by.x = "surname", by.y = "name")

```

```

##      surname nationality          title
## 1   McNeil   Australia Interactive Data Analysis
## 2   Ripley      UK      Spatial Statistics
## 3   Ripley      UK      Stochastic Simulation
## 4 Tierney      US      LISP-STAT
## 5    Tukey      US  Exploratory Data Analysis
## 6 Venables  Australia Modern Applied Statistics ...

```

3

```

my_sentence <- "To be, or not to be -- that is the question: Whether 'tis nobler in the mind to suffer
gsub("[T|t]o", 2, my_sentence)

```

```
## [1] "2 be, or not 2 be -- that is the question: Whether 'tis nobler in the mind 2 suffer The slings
```

Question 3

1

```

#data(iris)
head(iris)

```

```

##      Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5         1.4         0.2  setosa
## 2          4.9         3.0         1.4         0.2  setosa
## 3          4.7         3.2         1.3         0.2  setosa
## 4          4.6         3.1         1.5         0.2  setosa
## 5          5.0         3.6         1.4         0.2  setosa
## 6          5.4         3.9         1.7         0.4  setosa

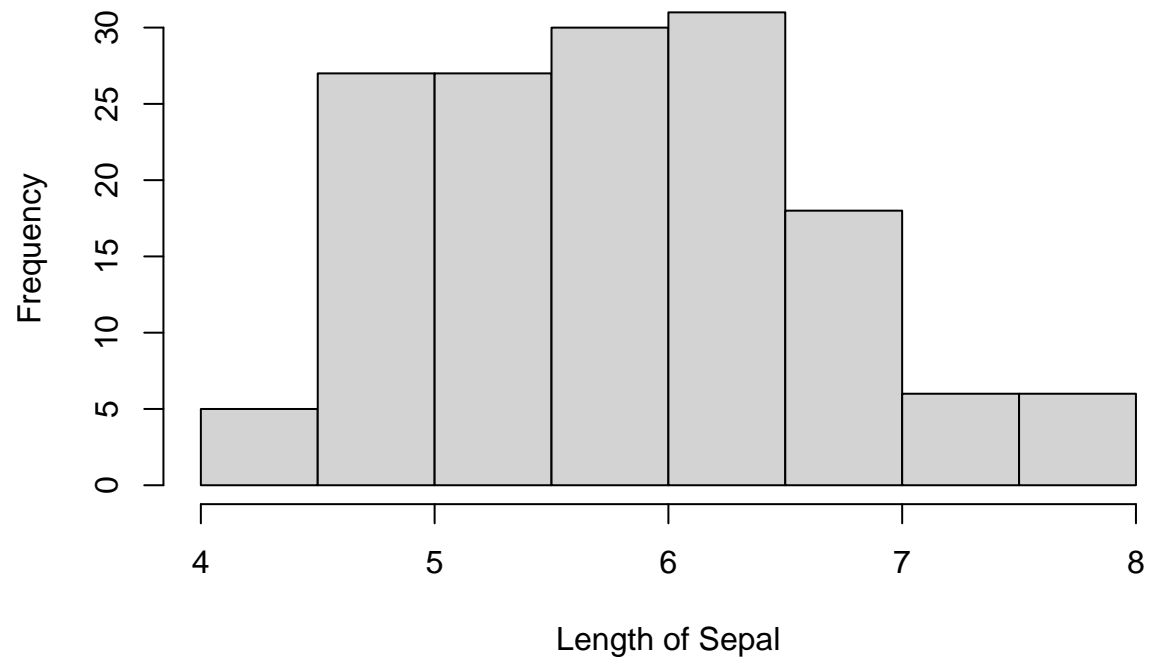
```

```

hist(iris$Sepal.Length, main = "Frequencies of sepal length in each numerical interval", xlab = "Length

```

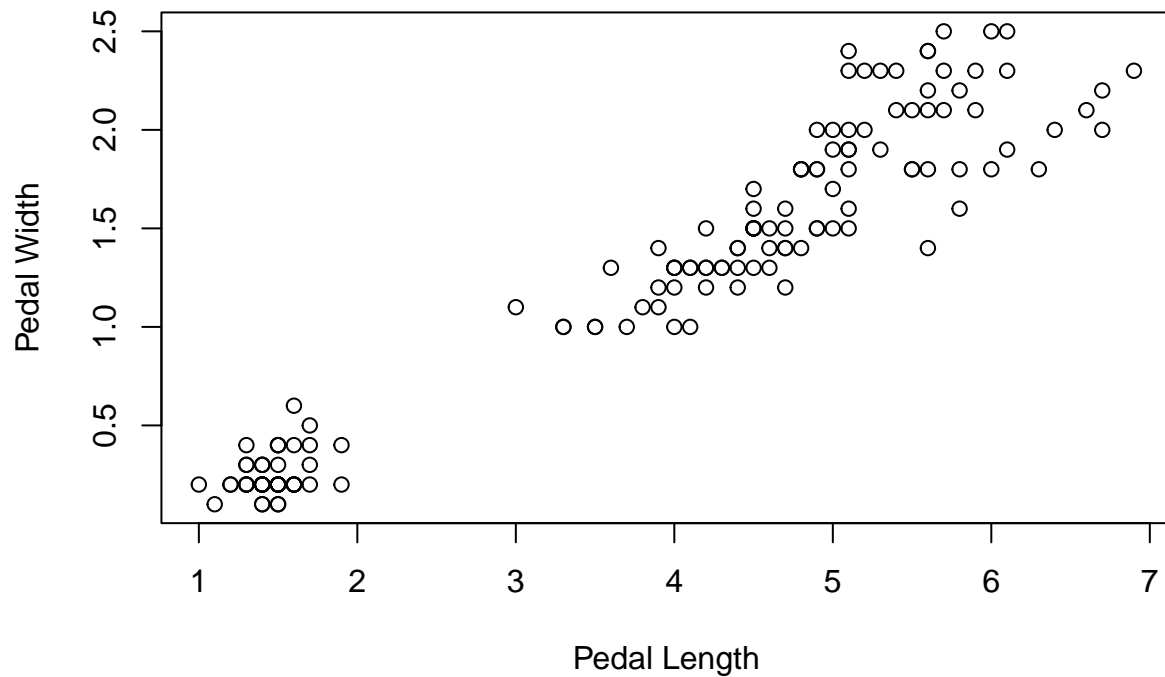
Frequencies of sepal length in each numerical interval



2

```
plot(iris$Petal.Length, y = iris$Petal.Width, main = "Distribution of iris by the feature pedal", xlab = "Petal Length",  
     ylab = "Pedal Width")
```

Distribution of iris by the feature pedal



3

```
library(tidyverse)
```

```
## -- Attaching packages ----- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5      v purrr  0.3.4
## v tibble  3.1.4      v dplyr  1.0.7
## v tidyr   1.1.3      v stringr 1.4.0
## v readr   2.0.1      v forcats 0.5.1
```

```
## -- Conflicts ----- tidyverse_conflicts() --
```

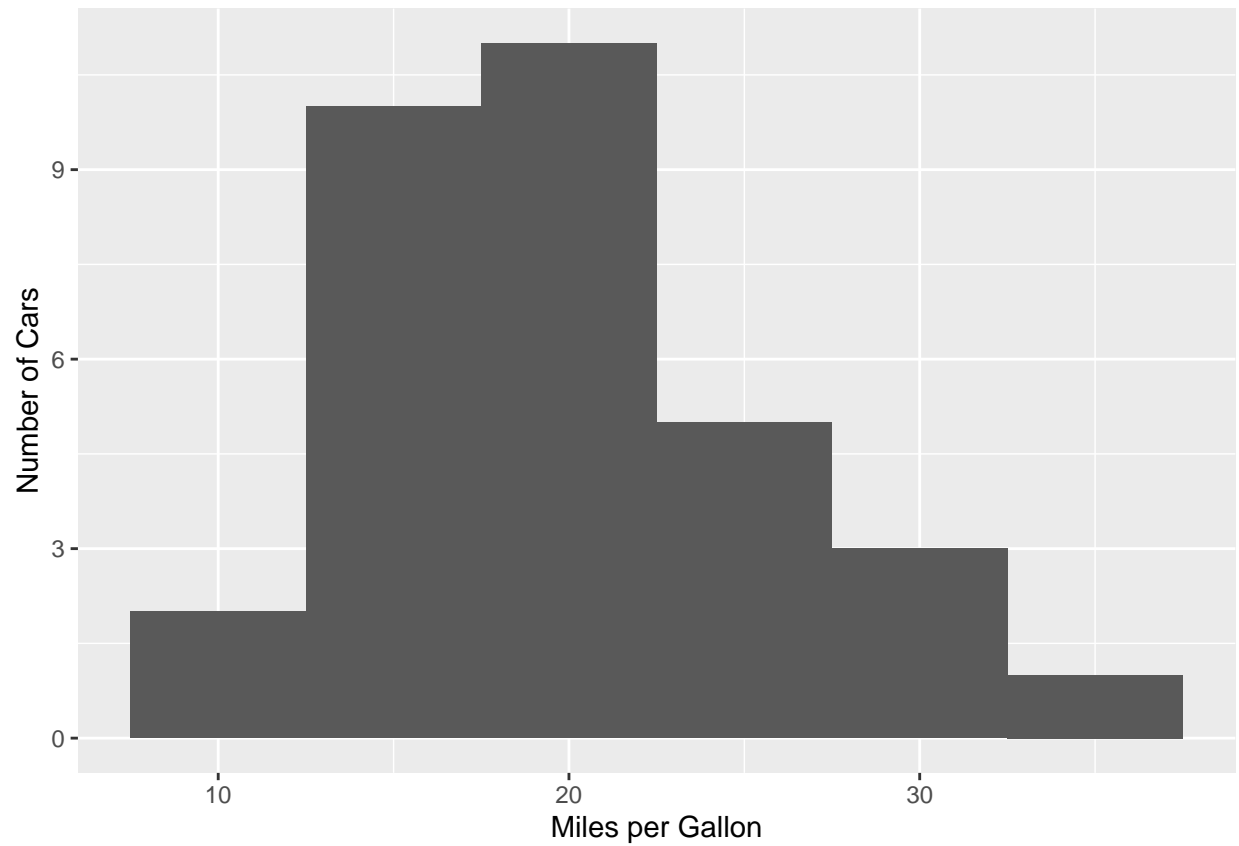
```
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
mtc <- mutate(mtcars, cyl=factor(cyl, ordered=TRUE, levels=c(4,6,8)))
head(mtcars, n=6)
```

```
##           mpg  cyl  disp  hp drat   wt  qsec vs am gear carb
## Mazda RX4    21.0    6  160 110 3.90 2.620 16.46 0  1    4    4
## Mazda RX4 Wag 21.0    6  160 110 3.90 2.875 17.02 0  1    4    4
## Datsun 710    22.8    4  108  93 3.85 2.320 18.61 1  1    4    1
```

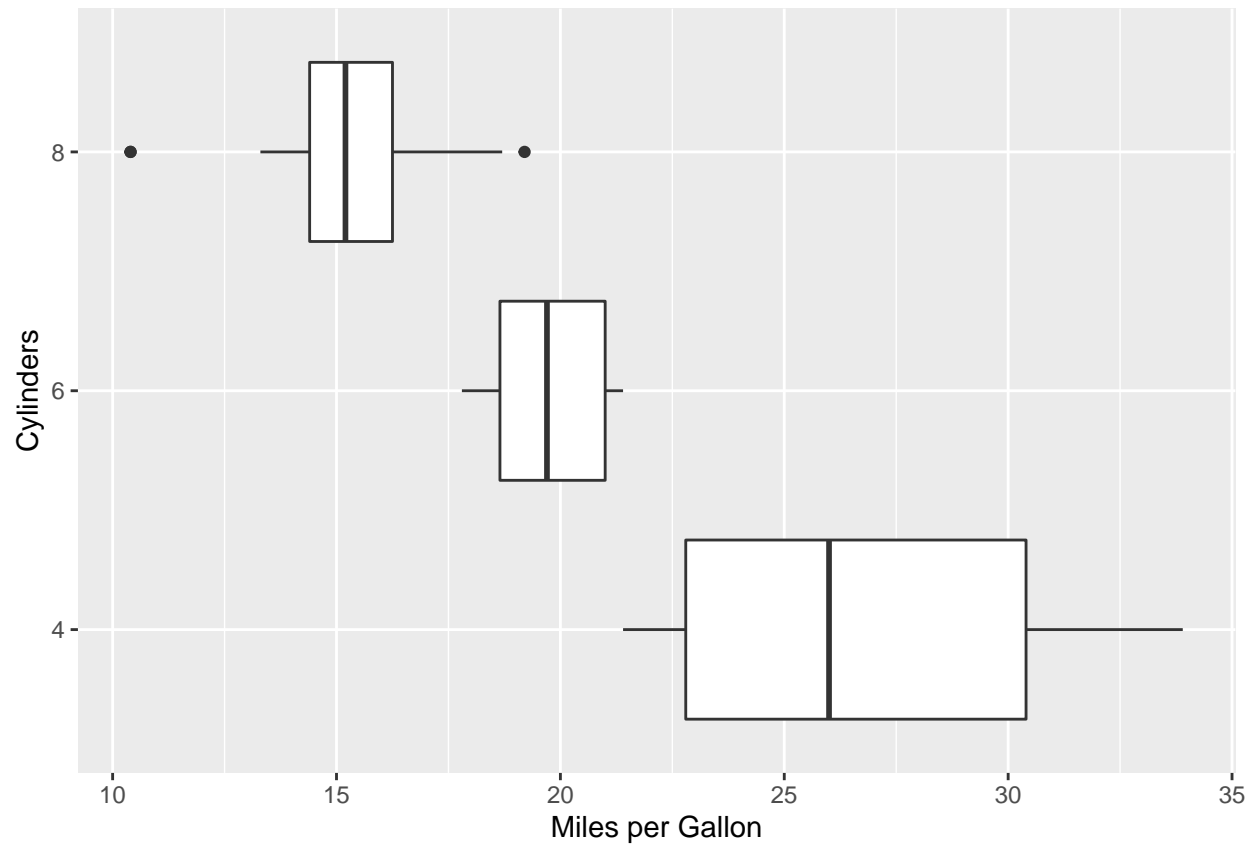
```
## Hornet 4 Drive      21.4   6  258 110 3.08 3.215 19.44  1  0   3   1
## Hornet Sportabout  18.7   8  360 175 3.15 3.440 17.02  0  0   3   2
## Valiant             18.1   6  225 105 2.76 3.460 20.22  1  0   3   1
```

```
ggplot(mtc,aes(x=mpg)) + geom_histogram(binwidth=5) + xlab('Miles per Gallon')+ylab('Number of Cars')
```



```
## 4
```

```
ggplot(mtc,aes(x=cyl,y=mpg)) + geom_boxplot() + xlab('Cylinders') + ylab('Miles per Gallon') + coord_fl
```



```
## 5
```

```
ggplot(mtc,aes(x=wt,y=mpg)) + geom_point() + xlab('Weight (x 1000lbs)') + ylab('Miles per Gallon') + ge
```

```
## 'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```

