

STAT 527 HW 7

Satoshi Ido (ID: 34788706)

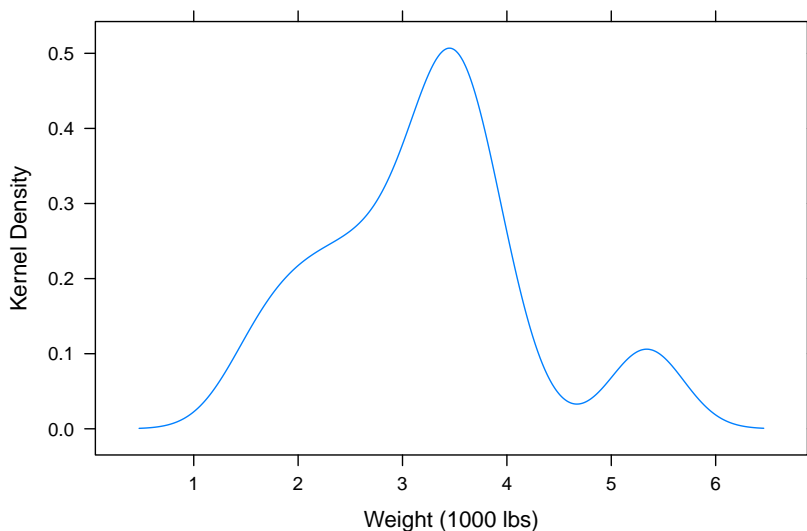
27 March 2023

```
# data prep
library("lattice")
library("dplyr")
data(mtcars)
head(mtcars)
```

```
##           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
```

Q1. Plot the density plot of the Weight (1000 lbs) of the cars with the function `densityplot()`.

```
# the density plot of Weight
attach(mtcars)
densityplot( ~ wt,
            xlab = "Weight (1000 lbs)",
            ylab = "Kernel Density",
            plot.points = FALSE
          )
```



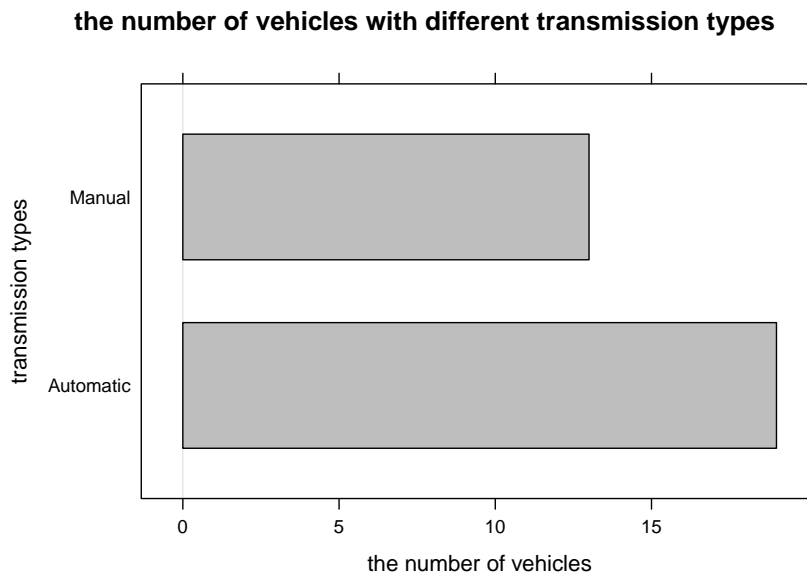
Q2. Add a new column transmission to the data frame mtcars. The new column should be a factor vector, each element labeled Automatic or Manual according to the Transmission type (already given in one of the data columns).

```
mtcars <- transform(  
  mtcars,  
  transmission = ifelse(  
    am == 0, "Automatic", "Manual"  
  )  
)  
  
# change the data type from the character into the factor  
mtcars$transmission <- as.factor(mtcars$transmission)  
head(mtcars$transmission)  
  
## [1] Manual    Manual    Manual    Automatic Automatic Automatic  
## Levels: Automatic Manual  
  
class(mtcars$transmission)
```

```
## [1] "factor"
```

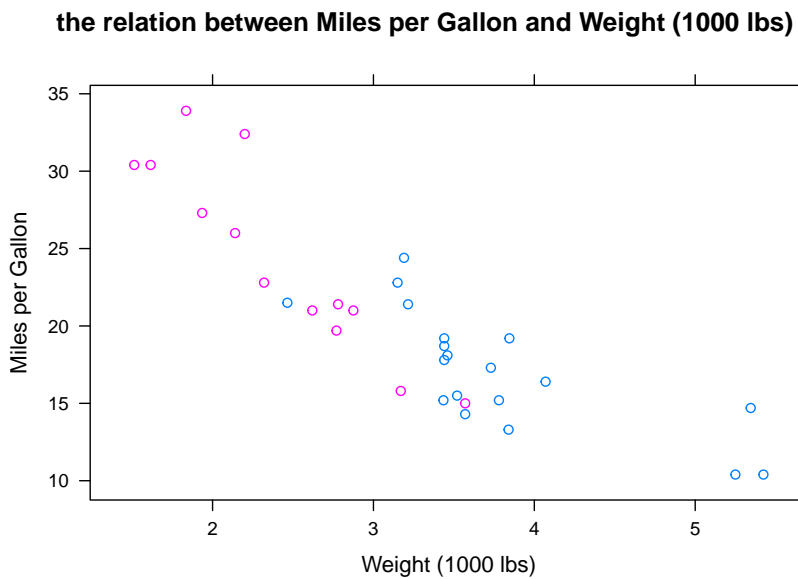
Q3. Use barchart() to compare the number of vehicles with the two different transmission types.

```
barchart(  
  mtcars$transmission,  
  horiz = TRUE,  
  main = "the number of vehicles with different transmission types",  
  xlab = "the number of vehicles",  
  ylab = "transmission types",  
  col = "grey"  
)
```



Q4. Use xyplot() to explore the relation between Miles per Gallon and Weight (1000 lbs), grouped by transmission.

```
xyplot(
  mpg ~ wt,
  data = mtcars,
  groups = transmission,
  xlab = "Weight (1000 lbs)",
  ylab = "Miles per Gallon",
  main = "the relation between Miles per Gallon and Weight (1000 lbs)"
)
```



Q5. Use `bwplot()` to explore the distribution of Miles per Gallon, grouped by transmission

```
attach(mtcars)
bwplot(mpg,
  by = transmission,
  xlab = "Miles per Gallon",
  main = "the distribution of Miles per Gallon grouped by transmission"
)
```

the distribution of Miles per Gallon grouped by transmission

