STAT 527 HW 7

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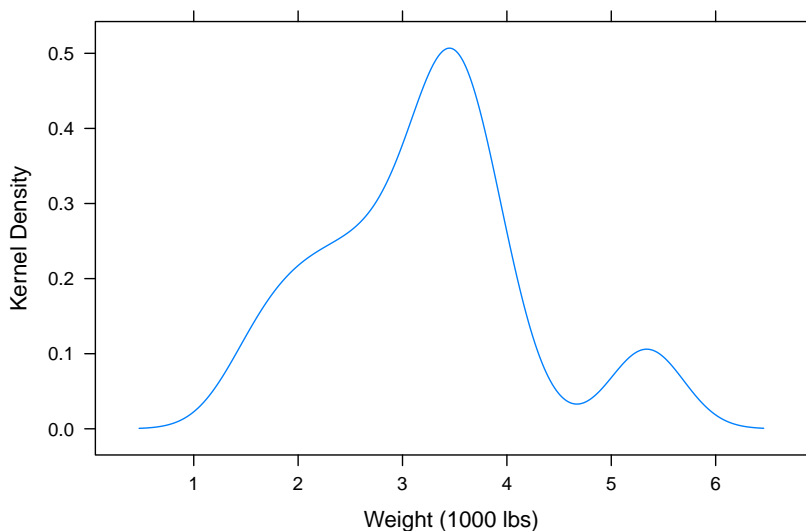
Q2. Add a new column transmission to the data frame mtcars. The new column should be a factor vector, each element labeled Automatic or Manual according to the Transmission type (already given in one of the data columns).

```
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"
    )
```

the number of vehicles with different transmission types
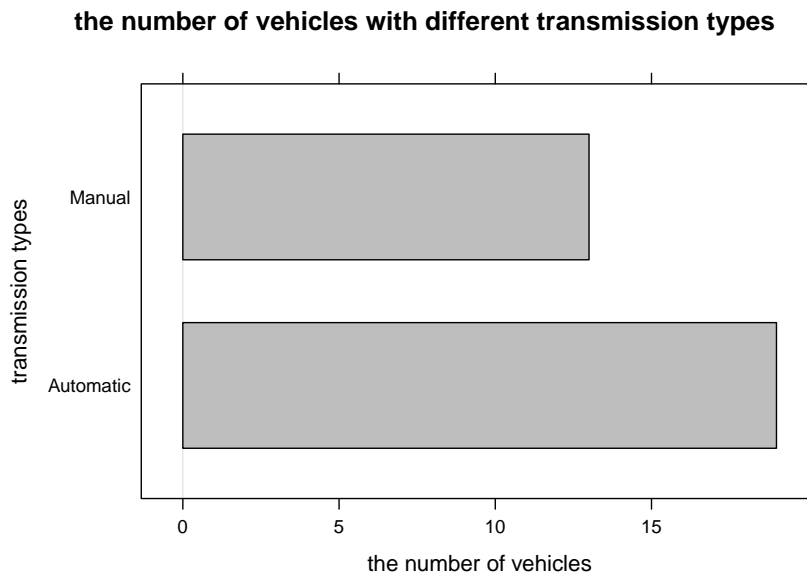
Q4. Use xyplot() to explore the relation between Miles per Gallon and Weight (1000 lbs), grouped by transmission.

```
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)"
    )
```

the relation between Miles per Gallon and Weight (1000 lbs)
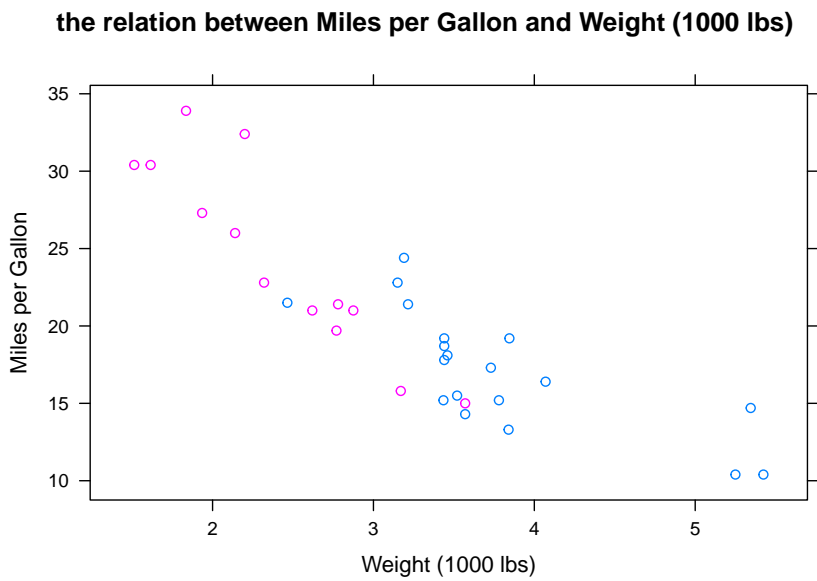
Q5. Use bwplot() to explore the distribution of Miles per Gallon, grouped by transmission

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

the distribution of Miles per Gallon grouped by transmission

Miles per Gallon