STAT40830 Homework 1

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Import data

The data I chose to usefor this submission was the `mtcars` dataset.

The mtcars dataset contains data on 32 different cars. The dataset features the following 11 variables:

- **mpg**: Miles/(US) gallon
- **cyl**: Number of cylinders
- **disp**: Displacement *(cu.in.)*
- **hp**: Gross horsepower
- **drat**: Rear axle ratio
- **wt**: Weight (1000 lbs)
- **qsec**: 1/4 mile time
- **vs**: Engine *(0 = V-shaped, 1 = straight)*
- **am**: Transmission *(0 = automatic, 1 = manual)*
- **gear**: Number of forward gears
- **carb**: Number of carburetors

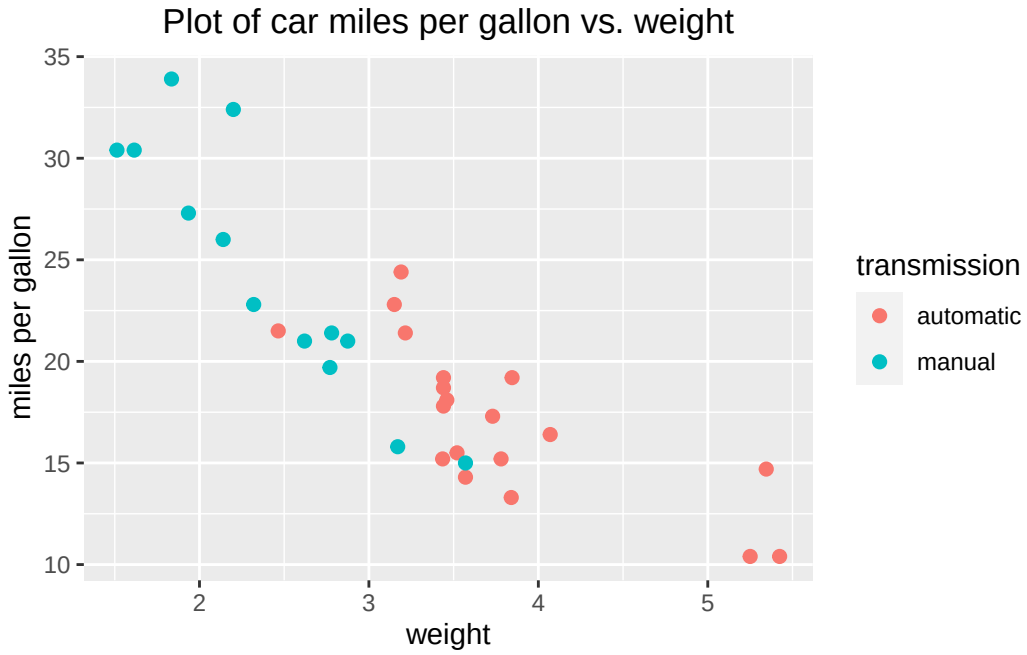
The following are summary statistics listed for the `mtcars` dataset:

```
      mpg             cyl             disp             hp       
 Min.   :10.40   Min.   :4.000   Min.   : 71.1   Min.   : 52.0  
 1st Qu.:15.43   1st Qu.:4.000   1st Qu.:120.8   1st Qu.: 96.5  
 Median :19.20   Median :6.000   Median :196.3   Median :123.0  
 Mean   :20.09   Mean   :6.188   Mean   :230.7   Mean   :146.7  
 3rd Qu.:22.80   3rd Qu.:8.000   3rd Qu.:326.0   3rd Qu.:180.0  
 Max.   :33.90   Max.   :8.000   Max.   :472.0   Max.   :335.0  
      drat             wt             qsec             vs             am       
 Min.   :2.760   Min.   :1.513   Min.   :14.50   v-shaped:18   automatic:19  
 1st Qu.:3.080   1st Qu.:2.581   1st Qu.:16.89   straight:14   manual   :13  
```

```
Median :3.695   Median :3.325   Median :17.71
Mean   :3.597   Mean   :3.217   Mean   :17.85
3rd Qu.:3.920   3rd Qu.:3.610   3rd Qu.:18.90
Max.   :4.930   Max.   :5.424   Max.   :22.90
     gear            carb
Min.   :3.000   Min.   :1.000
1st Qu.:3.000   1st Qu.:2.000
Median :4.000   Median :2.000
Mean   :3.688   Mean   :2.812
3rd Qu.:4.000   3rd Qu.:4.000
Max.   :5.000   Max.   :8.000
```

Plot

To demonstrate the data, I chose to plot the weight of the car relative to the miles per gallon. The categories are separated by the type of transmission.



The above plot indicates the following:

- The relationship between weight and miles per gallon generally decreases. As the weight of a car increases, the miles per gallon is likely to decrease, and vice-versa.

- Generally, an automatic car tends to have a higher weight than a manual car. As the previous point would imply, this also indicates that an automatic car is likely to have a lower miles-per-gallon than a manual car.