

# STAT40830 Homework 1

David Whymys

Jun 24, 2024

## Import data

The data I chose to use for 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

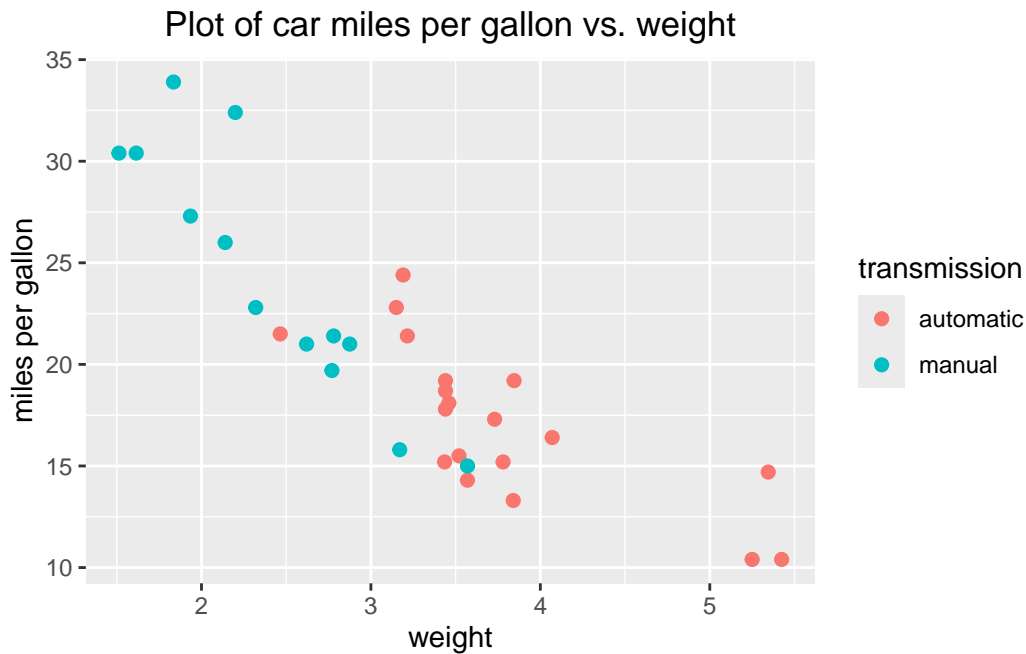
The following are summary statistics listed for the `mtcars` dataset:

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.