# Motor Tread Cars

In this exploratory analysis, we will explore if there exists a relationship between the weight of a car and it's mileage

```
library(tidyverse)
library(ggplot2)
library(GGally)
library(magrittr)
data(mtcars)
```

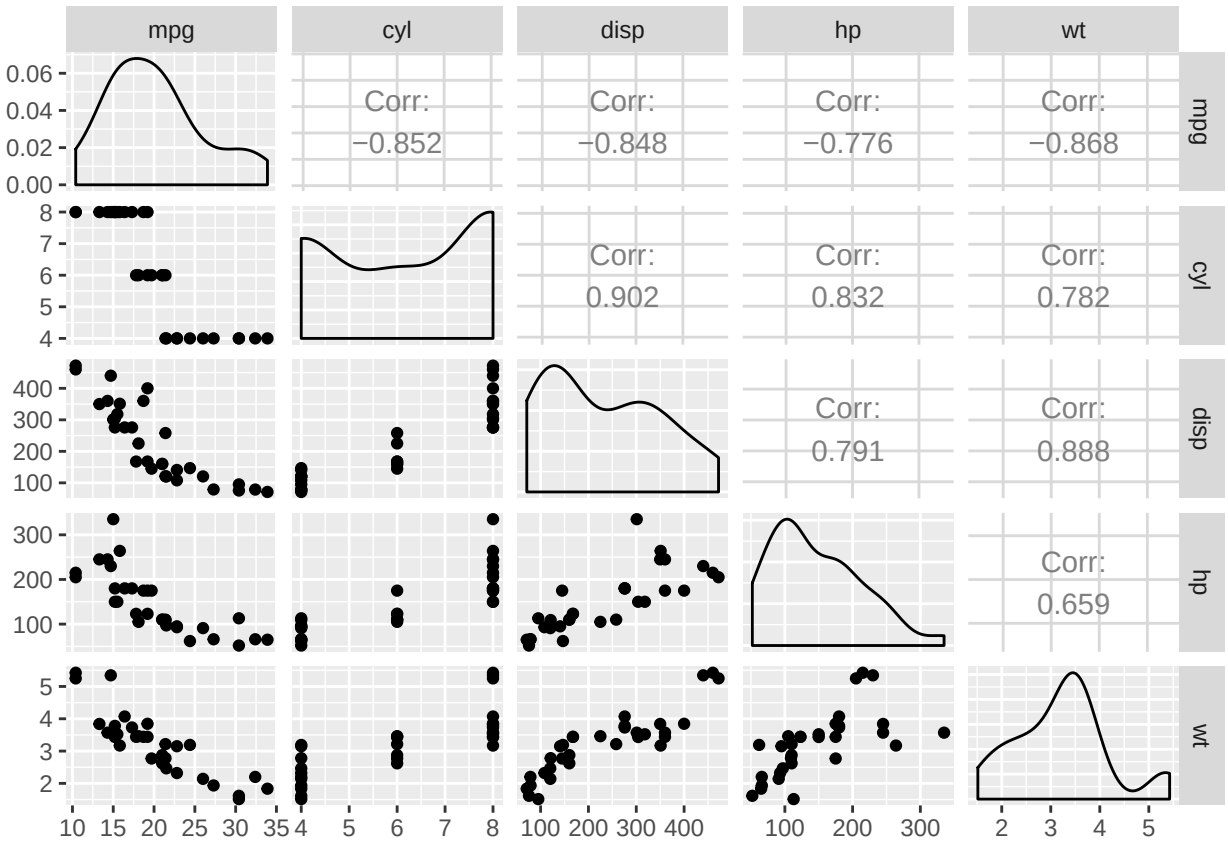
Let's look at part of the dataset to check how it looks

```
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
```

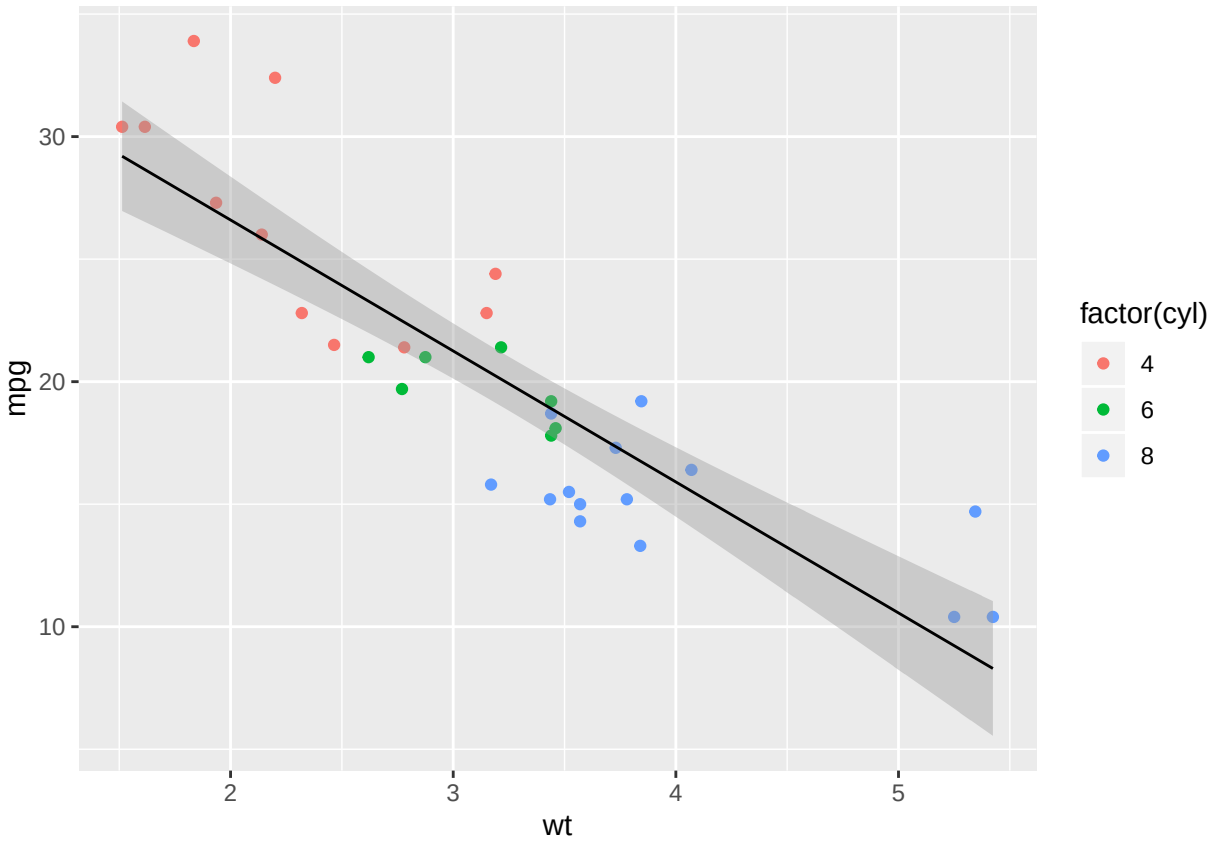
Checking the relationship of the varibales, it's correlations and their distributions

```
GGally::ggpairs(data=mtcars, columns = c(1,2,3,4,6))
```




Plotting the mileage of the car and checking it's relation with weight coloring by how many cylinder-engine it has.

```
ggplot(mtcars, aes(x=wt, y=mpg)) +
  geom_point(aes(color = factor(cyl))) +
  geom_smooth(method='lm', color = 'black', size = 0.5)
```




```
linear_model_mpg_pred <- lm(mpg ~ cyl + wt, data = mtcars)
```

Making a prediciton on a new weight based on the linear model

```
new_data <- data.frame(wt = c(3.5), cyl = c(factor(4)))

predict(linear_model_mpg_pred, new_data, se.fit = TRUE)
```

```
## $fit
##        1
## 27.01006
##
## $se.fit
## [1] 2.366422
##
## $df
## [1] 29
##
## $residual.scale
## [1] 2.567516
```