Exploring the Effect of Horsepower and Vehicle Weight on Quarter Mile Time
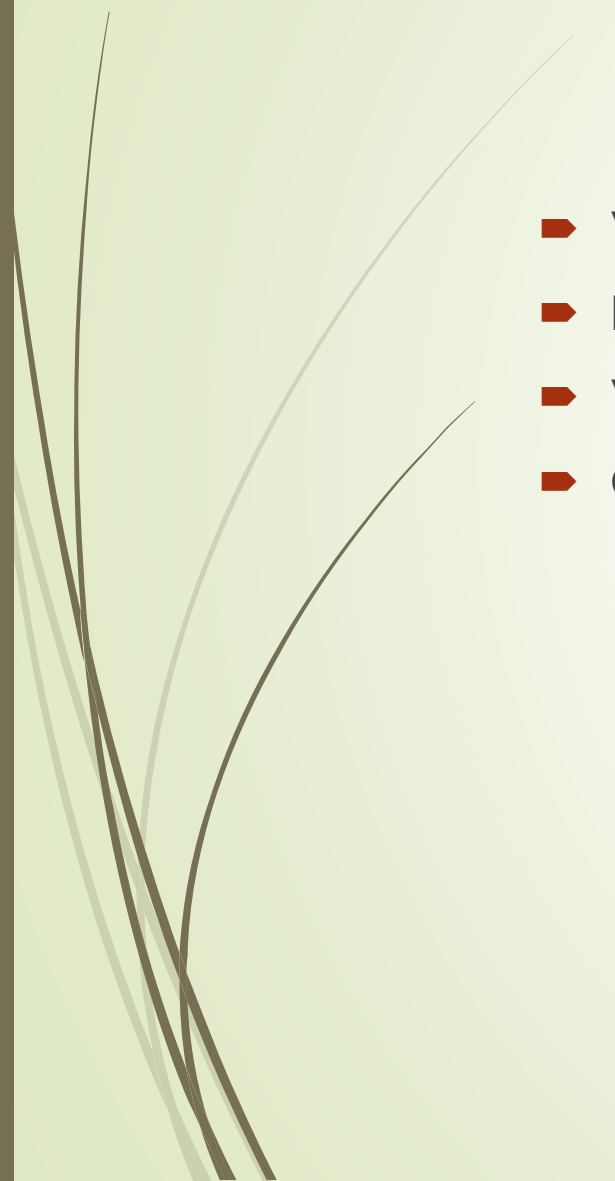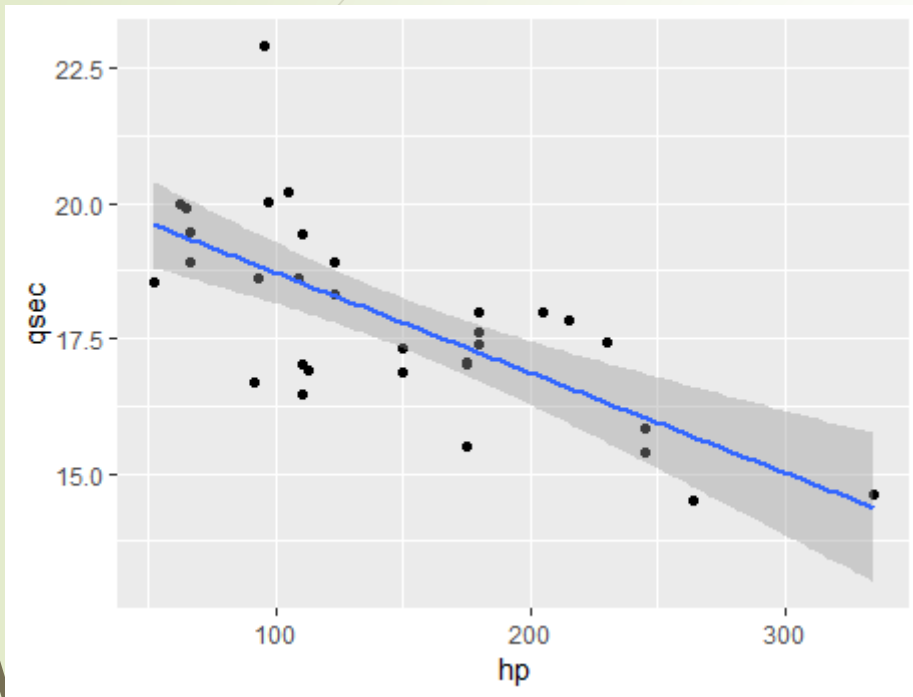
Overview

- View the dataset
- Horsepower
- Vehicle Weight
- Conclusions

Effect of Horsepower on Quarter Mile Time

Negative Correlation

Horsepower explains 49% of the variance in Quarter Mile Time

```
> regression <- lm(qsec~hp, mtcars)
> summary(regression)

Call:
lm(formula = qsec ~ hp, data = mtcars)

Residuals:
    Min      1Q  Median      3Q     Max
-2.1766 -0.6975  0.0348  0.6520  4.0972

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 20.556354   0.542424  37.897  < 2e-16 ***
hp          -0.018458   0.003359  -5.495 5.77e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.282 on 30 degrees of freedom
Multiple R-squared:  0.5016,    Adjusted R-squared:  0.485
F-statistic: 30.19 on 1 and 30 DF,  p-value: 5.766e-06
```
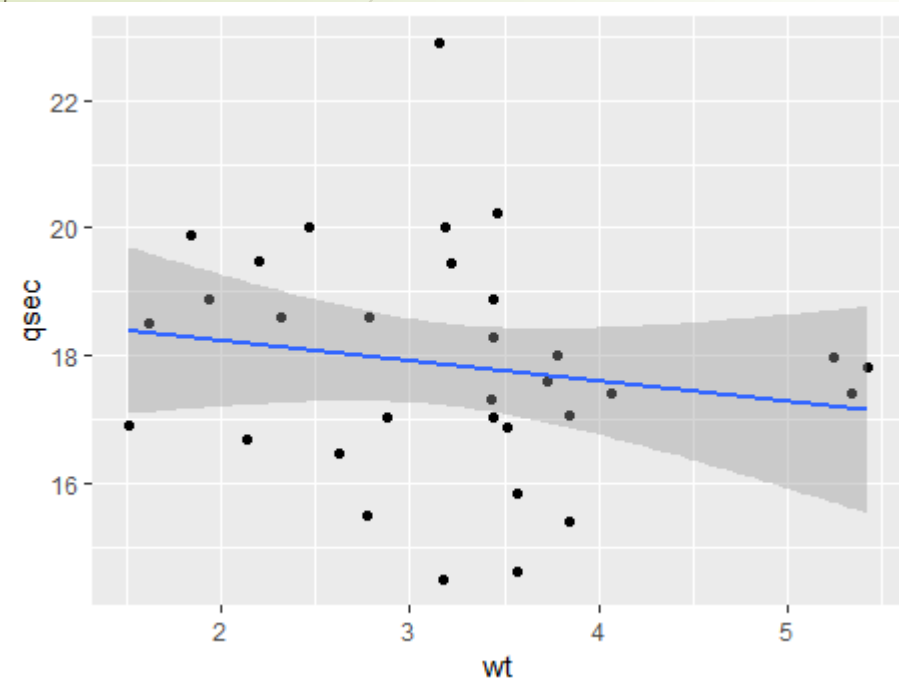
```
library("ggplot2")
ggplot(data=mtcars, aes(x = hp, y = qsec)) + geom_point() + geom_smooth(method='lm', se = TRUE)
```

Effect of Vehicle Weight on Quarter Mile Time

Vehicle Weight explains 0% of the variance in Quarter Mile Time

Uncorrelated

```
> regression2 <- lm(qsec~wt, mtcars)
> summary(regression2)

Call:
lm(formula = qsec ~ wt, data = mtcars)

Residuals:
    Min      1Q  Median      3Q     Max
-3.3638 -1.0766  0.2051  0.8655  5.0298

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  18.8753     1.1025  17.120   <2e-16 ***
wt           -0.3191     0.3283  -0.972    0.339
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.789 on 30 degrees of freedom
Multiple R-squared:  0.03053,    Adjusted R-squared:  -0.00179
F-statistic: 0.9446 on 1 and 30 DF,  p-value: 0.3389
```

```
library("ggplot2")
ggplot(data=mtcars, aes(x = wt, y = qsec)) + geom_point() + geom_smooth(method='lm', se = TRUE)
```

Summary and Conclusions

- Horsepower, but not vehicle weight, influence quarter mile start times.

- If you want to do well at the start of a race, invest in a car with higher horsepower and don't worry about the weight of the vehicle.