Regression Models: Course Project

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Executive Summary

The goal of this assignment is to find a relationship between a set of variables and miles per gallon (MPG) from the `mtcars` dataset. I particular, I am looking at the following two questions:

- Is an automatic or manual transmission better for MPG?
- What is the MPG difference between automatic and manual transmissions?

Data Processing

I begin the analysis by loading libraries and setting a few global parameters:

Exploratory Data Analysis

We begin by loading the data:

Model Fitting

My strategy for model selection is to

```
##
## Call:
## lm(formula = mpg ~ am, data = mtcars)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -9.3923 -3.0923 -0.2974  3.2439  9.5077
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   17.147      1.125  15.247 1.13e-15 ***
## am             7.245      1.764   4.106 0.000285 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 4.902 on 30 degrees of freedom
## Multiple R-squared:  0.3598, Adjusted R-squared:  0.3385
## F-statistic: 16.86 on 1 and 30 DF,  p-value: 0.000285
```

A review of the model summary (see appendices) reveals that it is statistically significant ($p =$).

```
## (Intercept)          wt        qsec          am
##    9.617781   -3.916504    1.225886    2.935837
```

Model 2

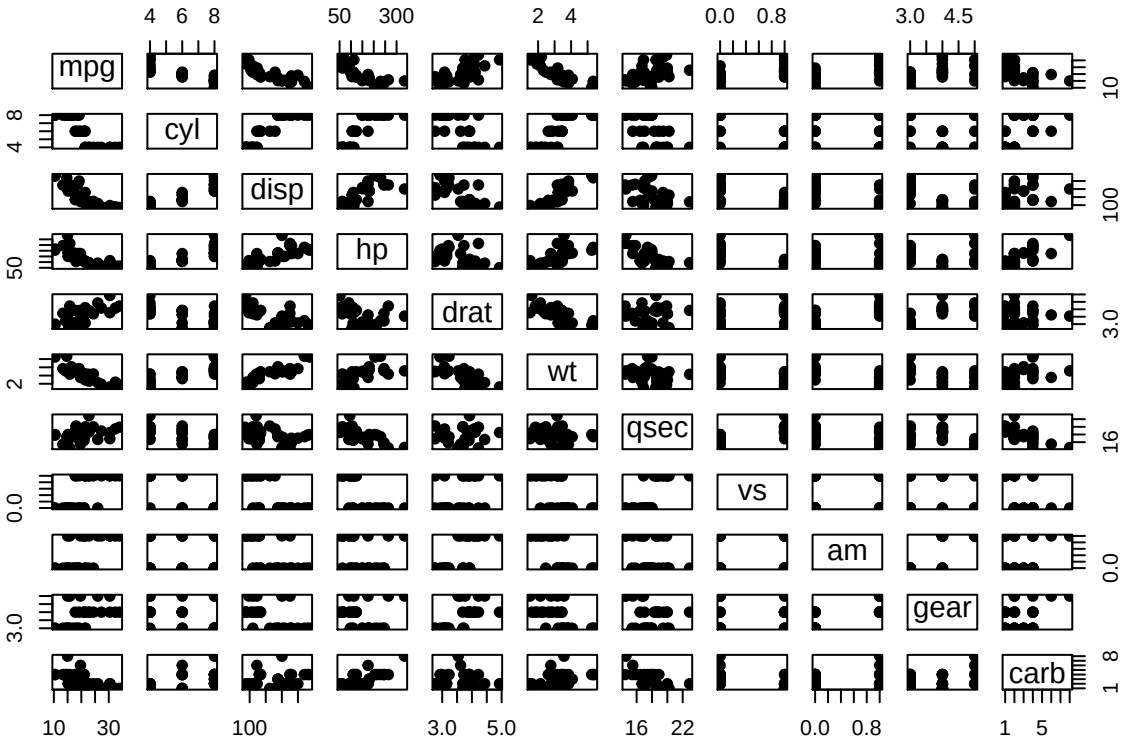
Coefficient Interpretation

Findings

Uncertainty in the models can be quantified with the confidence intervals.

Appendices

Appendix A: Exploratory Charts



Appendix A: Model Diagnostic Plots