Motor Trend

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Regression Model Course Project

Executive Summary

This project explores the relationship between a set of variables and miles per gallon (MPG) in mtcars data set. In particular, this project determins whether an automatic or manual transmission is better for MPG, and quantifies the difference. In my simple model, the mean MPG difference is 7.245 MPG; the average MPG for cars with automatic transmissions is 17.147 MPG; the average MPG for cars with manual transmissions is 24.392 MPG. The result shows that manual transmission is bettern in terms of MPG.

Exploratory analysis is located in the Appendix.

Analysis

```
##              Estimate Std. Error   t value      Pr(>|t|)
## (Intercept) 17.147368   1.124603 15.247492 1.133983e-15
## am           7.244939   1.764422  4.106127 2.850207e-04
```

The intercept means the mean MPG for automatic transmissions. The slope means the increase in MPG from cars with manual transmission (am=1). The sum (intercept+slope) is the mean MPG for manual transmissions.
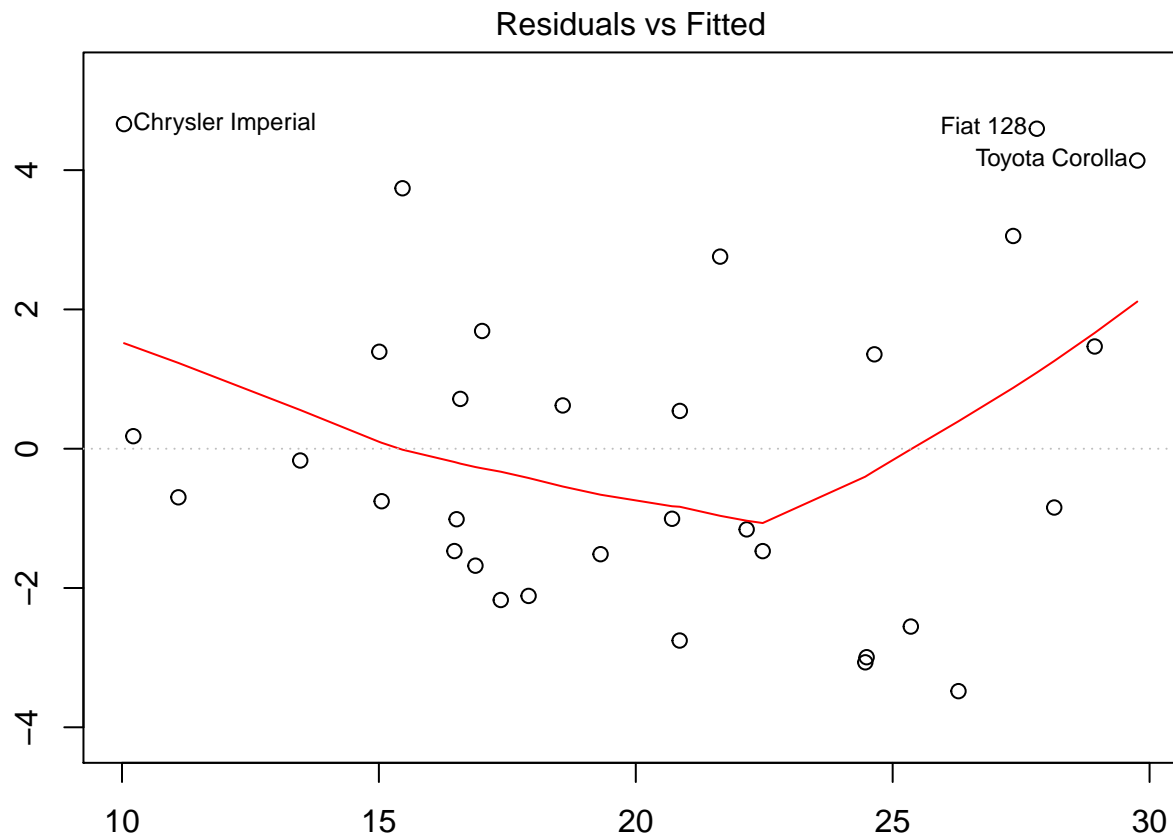
Now we calculate the 95% confidence interval for the MPG difference:

```
## [1]  3.64151 10.84837
```

The p-value for the MPG difference is small and the interval does not include zero, so we can reject null hypothesis.

Appendix

Residual Plot

Residuals vs Fitted

Histogram

```
## stat_bin: binwidth defaulted to range/30. Use 'binwidth = x' to adjust this.
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