1 MTH225-8 IC1: Multiple regression

Names: (signatures only please, printed names will not be counted)

1.) 4.)

2.) 5.)

3.) 6.)

1.1 Overview

The EPA gas mileage estimates resulted in the phrase "Your actual mileage will vary" being added to the vernacular.

In this exercise we will use a regression model and the 2009 EPA gas mileage data to estimate the effect of vehicle weight on gas mileage.

We will use the posterior draw (the stanfit data structure) to construct a 95% confidence interval for the **predicted** gas mileage of a vehicle with a specific weight, horsepower, and axle ratio.

1.2 Instructions

As usual, start by brining your copy of the MTH225_Fall2016 up to date using git: Open a command prompt or terminal window and use the `cd` command to change to the `MTH225_Fall2016` subdirectory. Once there, type the following command:

```
git pull origin master
```

- Open the file `MTH225-8_multiple_regression_example1.Rnw`
- Click on the "Compile PDF" icon and see if this program will run as is.
- Add code to process the posterior draw and compute 95% confidence intervals for the predicted mileage of a vehicles weighing 4200 pounds with a 300 horsepower engine and an axle ratio of 2.69.
- With the modified Rnw file, click on "Compile PDF"
- Use the output to answer the questions.

1) How would you interpret the coefficients of weight, horsepower, and axle ratio in this problem?

2) How would you interpret the intercept?

3) What are the 95% confidence limits for the predicted mpg for a vehicle weighing 4200 pounds with a 300 horsepower engine and an axle ratio of 2.69?