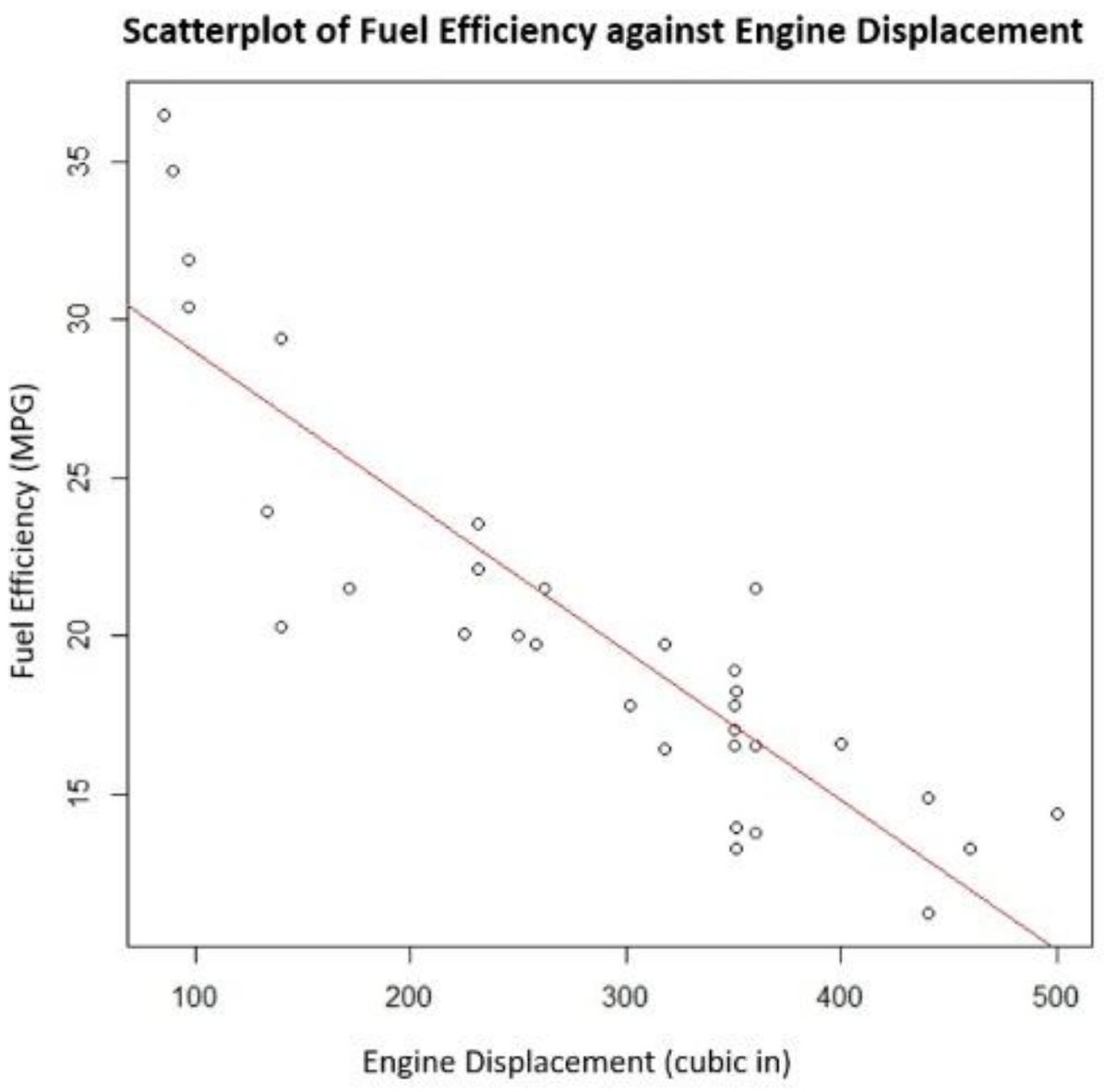
Topic 1.1: Introduction to the Lesson

Linear regression models are widely used to explore the relationship between variables. In this module, we introduce the simple linear regression model. The term "simple" implies we consider one predictor variable and one response variable. Regression models always have one response variable. In module 4, you will learn about the multiple linear regression model, which is used when we have more than one predictor variable. We start with simple linear regression as it is much easier to visualize concepts in regression models when there is only one predictor variable.

The most common way of visualizing the relationship between one predictor variable and one response variable is with a scatter plot. You have seen these before. For example, this scatterplot shows the fuel efficiency of vehicles and their engine displacement among 32 automobiles.



Typical questions that we have include the following: Are engine displacement and fuel efficiency related to one another? How strong is this relationship? Could we use these data to make a prediction for the fuel efficiency of a vehicle that is not on this graph? How confident are we of the prediction?

A lot of these questions can be answered using simple linear regression.

Refer to these files to see the notation used in linear regression.

mod1_notation.pdf
Notation in Simple Linear Regression