The following is a “real-world” consulting project taken from an old M.S. exam at the University of Wisconsin-Madison).

The data (available on the course Web page) were collected by researchers in the Mechanical Engineering Department to study the relationship between the ignition delay in a diesel engine and four experimental variables. These variables are:

1. speed of the engine
2. load on the engine
3. percentage of alcohol in the fuel
4. injection timing

Their goal is to find a model that will adequately predict the ignition delay as a function of these four variables. They’re seeking your outside help to assist in developing this model.

Your task is to prepare for an initial face-to-face meeting with the researchers. They’ve provided you the data so you can perform some preliminary investigations.

For this homework:

1. Create up to four ‘key graphs” that you plan to use in the initial meeting. For each graph, provide a one- or two-sentence explanation of why you plan to use it.

2. List five key questions you plan to ask the researchers at this meeting. These questions can be related to your graphs or completely separate. Order them in the order you plan to ask them.

We will discuss the key graphs and questions in class on Jan 18th. Please make two copies of your homework (one to hand in at the beginning of class for me to grade and one for reference during class).