DSC 423: Data Analysis and Regression Assignment 10

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Problem 1

To execute a fair enough experimental design for the survey, we should follow the rules of reducing noise and enhancing the signal.

The first bias that could enter the above study is selection bias. Even if it is a random method to just place an ad on the radio to conduct a simple survey, the researcher may still have control over the survey, which may result in a selection bias in which research samples occasionally misrepresent what is necessary for the research study.

The observation bias is the second bias that could enter the preceding investigation. Observation bias can occur when the person who will call is aware of the study being conducted, which is the effect of rising gas prices on drivers. What the respondents will do is they can either change the answers they will give to the researchers whether they are aware or not.

The third bias that could enter the above study is the confirmation bias. Confirmation bias can occur during the evaluation of obtained data when researchers are unconsciously looking for patterns or information in their data to simply support the beliefs that they already know.

Problem 2

Yvette's experience does not give sufficient data to support the premise that cell phone use causes brain tumors. First and foremost, the data is from a subset of the population; it does not represent the entire population of cell phone users. Second, because we can observe that two of her friends (number of friends not given) had a brain tumor, which is a small fraction, we cannot conclude that cell phone use causes brain tumors.

Problem 3

1. The experiment unit is the sealed package’s liner.
2. Temperature and three liners.
3. They have 12 combinations of temperature and type of liners.
4. The peel strength of each seal.
5. Peal strength of each seal = B0 + B1x1 + B2x2 + B3x3 + B4x4

B0 is intercept

B1 is the slope at the condition of 250 F in the x1

B2 is the slope at the condition of 275 F in the x2

B3 is the slope at the condition of 300 F in the x3

B4 is the slope at the condition of 325 F in the x4

1. Yes, it is a Randomized Block Design. Because a randomized block design is an experiment in which samples with common characteristics are grouped to form blocks and then specific treatments are randomly assigned within each block. We can see that 6 pairs of package liners are organized into three different types of the liner (A, B, C) and that they seal five pairs at each of 250 °F, 275 °F, 300 °F, and 325 °F as treatments.