**Problem Set 1**

On Moodle, there is an excel file titled, “Problem Set 1.xlsx”. This file contains two data sets: one for each of the two problems described below.

For each problem, write a 1-2 page summary of the analysis you performed to answer the specified question. Make sure to include any appropriate graphs and summary statistics. Describe how you decided which statistical technique to use. Be sure to include a discussion on the assumptions necessary to apply the technique and whether the data met those assumptions. Make sure you clearly state your conclusion and include appropriate calculations that quantify the uncertainty in your conclusion. Also make sure you address any appropriate inferences and assessments of causality.

1. A county recreation department is interested in comparing a new fertilizer to one that has been used in the past on each of 20 different soccer fields. Each field was divided in half, with the new fertilizer randomly assigned to one half of the field and the old fertilizer to the other half. The same amount of fertilizer per acre was then applied to the fields. The effect of the fertilizer on the grass grown at each field was measured by the weight (in pounds) of grass clippings produced by mowing the grass at the fields over a specified period of time. Evaluate whether the new fertilizer tends to produce more grass than the old fertilizer. The data are given in the tab labeled “Problem 1”.
2. In a study on pain relief for arthritis patients, an experiment was conducted to compare the effectiveness of three new pain relievers: PR1, PR2, and PR3. A clinic evaluated a group of patients and identified 45 patients with a moderate level of pain. Fifteen of the 45 persons were then randomly assigned to receive of the three pain relievers. The percentage reduction in pain level was assessed for each patient. Evaluate whether the reduction in pain is the same for all three pain relievers. The data are recorded in the tab labeled “Problem 2”.