STATISTICS 402 - Assignment 2
Due February 3, 2014

1. Chapter 1: Review Exercises (pgs. 34-37) # 3, 4, 5, and 8.
2. For each of the following descriptions, answer the following questions using complete sentences. Also comment if the experiment is fine as described or flawed. If flawed, explain how to fix the experiment.
   - What is the response?
   - What are the conditions of the study (i.e. treatments)?
   - What is the experimental material? What are the experimental units?
   - What are the outside variables that are controlled? Is there a control group? If so, explain what the control group is.
   - Are treatments randomly assigned to the experimental units? Is experimental material randomly selected from a larger population?
   - Is there replication within the experiment? Is the experiment repeated?
   - Is the experiment fine as described or is it flawed. If flawed, how can it be fixed?

   a) A study was done with 644 cancer patients receiving chemotherapy at one of several cancer treatment centers across the United States. All the patients had suffered nausea in a previous round of chemotherapy even though they were given standard anti-nausea medicines. Patients were given one of three doses of ginger (the equivalent of ½ gram, 1 gram or 1 ½ grams of ginger per day) or dummy capsules that contained no ginger. The amount of ginger each patient received was determined at random so that 161 patients got each amount of ginger. All patients were given standard anti-nausea medicines in addition to the ginger or no ginger. Patients took the medicines and ginger/no ginger for six consecutive days, beginning three days before chemotherapy. Each day participants reported the amount of nausea they were experiencing on a scale from 0 (no nausea) to 10 (extreme nausea).

   b) Much of the salmon sold in grocery store fish markets is “farm raised.” Salmon “farming” involves hatching salmon from eggs in fresh water tanks and letting them grow for 12 to 18 months. The young salmon are then transferred to cages suspended in the sea where they are fed for another year or two before harvesting. The salmon are usually fed pellets made from fishmeal. However, using fishmeal in this way raises environmental concerns because natural occurring fish populations are depleted to make the fishmeal. A company proposes to use soybean meal as a partial substitute for fishmeal but salmon farmers are concerned that this might affect the weight of salmon at harvest time. An experiment is proposed to compare pellets made of 100% fishmeal with pellets made of 75% fishmeal and 25% soybean meal and with pellets made of 50% fishmeal and 50% soybean meal. Because it is difficult to keep track of individual salmon, only the final weight of salmon at harvest will be recorded.

   For the experiment, 300 young salmon are selected at random from the hundreds of thousands of young salmon in the fresh water tanks. Those 300 young salmon
are then divided into three groups at random. One group of 100 will be put in a sea cage and fed pellets made of 100% fishmeal. Another group of 100 will be put in another sea cage and fed pellets made of 75% fishmeal and 25% soybean meal. The third group of 100 will put in a third sea cage and fed pellets made of 50% fishmeal and 50% soybean meal. Which type of pellets a group of 100 salmon gets is determined at random. Each sea cage is given the same amount of pellets each time the salmon are fed. Feeding is done at the same time each day for all the sea cages. After one year in the sea cages, the salmon are harvested and weighed.

c) One theory regarding memory states that verbal material is remembered as a function of the degree to which it was processed when it was initially presented. To test this theory an experiment is run with 100 college students selected at random from all those students enrolled in psychology courses at a large university. Each student will use one of five methods to memorize a list of words. The method a student will use is determined by rolling a fair die. The number on the upper most face of the die indicates the method.

1. The Counting method involves reading a list of words and counting the number of letters in each word.
2. The Rhyming method involves reading a list of words and thinking of words that rhyme with each word on the list.
3. The Adjective method involves reading a list of words and thinking of adjectives that modify the words, one adjective for each word.
4. The Imagery method involves reading a list of words and forming vivid images for each word.
5. The Standard method involves reading a list of words and no other instructions are given.
6. Roll the die again.

Once a method has 20 students assigned it can no longer be assigned thus assuring there are 20 students for each method. All students are given the same list of 30 words. All students are given 15 minutes to read the list, employing the method given to them. After 15 minutes the list is taken away and students are asked to write down all the words they can remember. The number of words correctly recalled is noted for each student.