Unit 4: *Summing It Up*

Below are prompts to help you discuss some key ideas from Unit 4. Pick **three** to write about for your *Summing It Up* assignment.

1. **Descriptive vs. Inferential Statistics**: Recall the descriptive statistics is for describing a population (a whole group of people or objects), whereas inferential statistics is for inferring something about a population from a sample; it relies on the theory of probability. Give some real life examples of each type of statistics, and and discuss why it matters to understand the difference.

2. **A Distribution**: "[T]hings that seem hopelessly random and unpredictable when viewed in isolation often turn out to be lawful and predictable when viewed in the aggregate" (Strogatz, 176). Explain what this means in your own words, giving real life examples to illustrate your point.

3. **Notion of "Typical"**: When dealing with a normal distribution, the notion of "typical" is fairly clear, but the notion of "typical" is not always so clear. Explain this by comparing and contrasting the relationships among the mean, median, and modes of the normal distribution (bell curve) and those of the power law distribution ("L-curve") discussed in Joy, Ch 20 (see p178-181).

4. **Data Visualization**: Explain how data visualization can summarize a large amount of data in a way that is easy to understand. Discuss at least one specific form of data visualization (histogram, boxplot, etc.) Also discuss at least one way that data can be displayed in misleading way.

5. **Voting Methods**: State each of the four voting methods we studied, and discuss their advantages and disadvantages.

6. **Fairness**: State each of the four fairness criteria we studied, and explain them in your own words. Discuss Arrow's Impossibility Theorem and its practical implications.

7. **Group Decision Making**: Discuss at least three other criteria (besides "fairness") that a group might consider when considering how to go about making a decision together. Suggest at least three other methods (besides voting) that a group might use in order to make a decision together.

8. **Fairness in the Bible**: Using at least three bible passages (from the list I gave you or elsewhere), discuss what the Bible tells us about fairness. In particular, in what ways does God ask us to behave with "fairness" towards one another? On the other hand, in what ways does God act (and ask us to act) that seem "unfair" from a worldly perspective?

9. **Propose a Key Idea**: If an idea from Unit 4 struck you that is not on this list, you may propose your idea to me (one week before the portfolio is due), and I will let you know if it is suitable as a key idea for Unit 4.