I. Administrative

A. Problem sets – PS#3 will be back to you by Tuesday; PS#4 is due next Friday by 5 pm.

B. Questions?

II. Inductive vs. Deductive Arguments

A. Deductive arguments are:

1. Intended to be evaluated relative to the standard of validity, according to which the conclusion must be true if the premises are

2. A deductive argument will be good only if it is valid—this is the primary logical standard. (Soundness it the more important standard here, but it turns on extra-logical matters.)

B. All other arguments are inductive, or non-deductive

1. These will be evaluated for strength, which will depend on the degree to which their conclusions are made likely by their premises

2. They should not be evaluated relative to the standard of validity, since they are not valid and not intended to be valid

3. They come in a variety of forms, including: statistical generalizations, statistical applications, inference to the best explanation, arguments from analogy, and causal reasoning

C. Differences between deductive and inductive arguments:

1. Deductive arguments are monotonic, while inductive arguments are not; this implies that inductive arguments are defeasible, while deductive arguments are not
2. Inductive strength comes in degrees, while deductive validity does not

3. Remember that much depends on intention

4. Rules of Thumb:
   a. **Inductive**: the conclusion is guarded (e.g., ‘likely’, ‘most’); the conclusion is derived on the basis of the content of the premises (i.e., evidence) and not the structure of the premises (i.e., their form)
   
   b. **Deductive**: the conclusion is universal and exceptionless (although be careful – it could just be a bad inductive argument); the argument appears to turn on the logical structure of the steps, with the conclusion being derived out of the structural relationships among the sentences

5. **Not:**
   a. Deductive arguments move from general to particular and inductive from particular to general
   
   b. Inductive arguments have a different structure from deductive arguments

D. **Examples** (11.1, 11.2)

III. **Statistical Generalizations**

A. In these arguments, “statistical features of a sample are used to make statistical claims about the population as a whole” (220). (These are traditionally referred to as “inductive” arguments.)

B. Consider an example: I’ve been to Espresso Royale a bunch of times to get coffee and they have had a line every time; thus, Espresso Royale always has a line

C. **Evaluating statistical generalizations:**

   1. Do we have reason to believe that the premises are true?
   
   2. What is the nature of the sample?
      
      a. Is it large enough? (Avoid *hasty generalizations.*)
b. Is it biased? (Avoid biased sampling.)

3. Are there other sorts of bias involved? (Avoid leading questions; avoid implicit bias.)

D. Examples: By asking the evaluative questions, specify what, if anything, is wrong with the following statistical generalizations:

1. This philosophy class is about logic, so most philosophy classes are probably about logic.

2. Most college students like to ski, because I asked a lot of students at several colleges in the Rocky Mountains, and most of them like to ski.

IV. Statistical Applications

A. In these arguments, “from information concerning a population, we draw a conclusion concerning a member or subset of that population” (225).

B. These are of the form:

\[ X \text{ percent of } F \text{s have the feature } G \]

\[ \text{a is an } F \]

\[ \text{a has the feature } G \]

1. Here \( F \) is the reference class – we make reference to it when we make the statistical application

2. Reference classes can be more or less relevant to the feature in question

3. It could be that \( a \) belongs to different relevant reference classes, which could lead to conflicting applications

C. Evaluating statistical applications:

1. Have we selected an adequate reference class?

2. Are we operating in a framework broad enough to help us separate significant from insignificant features?

3. Avoid stereotyping
D. **Examples:** For each of the following statistical applications, identify the reference class, and then evaluate the strength of the argument in terms of the percentages or proportions cited and the relevance of the reference class.

1. Less than 1 percent of the people in the world voted for Romney. Michelle is a person in the world. Therefore, Michelle did not vote for Romney.

2. Very few teams repeat as Super Bowl champions. Denver was the last Super Bowl champion. Thus, Denver will not repeat as Super Bowl champion.