Instructions: Do the reading, then go through the questions, think about them, referring back to the reading when necessary, and write short answers (ranging between 1-2 sentences and couple paragraphs) for each. (If you feel you addressed one question in an answer to another, feel free just to refer to that.) Turn in your answers on the day the reading is due. You may discuss these questions with others but all answers should be written in your words (though you may use occasional quotes).

To be turned in:

1. What are your overall thoughts?
2. Do you think Voulgaris is lucky, or skilled, or both (or neither)? Why?
3. Is a calculation of expected profit, as in Figure 8-1, the main thing you should consider for placing a bet? If not, can you think of another measure to decide when you should make a bet?
4. The mathematical formulation of Bayes' theorem is

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)},$$

   where A, B are events with $P(B) \neq 0$. Prove Bayes' theorem in the case of a finite sample space. (Recall $P(A|B) = \frac{P(A \cap B)}{P(B)}$.)
5. Explain to interpret the above statement of Bayes' theorem in the context of Silver's "strange underwear" example (Figure 8-3).
6. Say you have a test to check whether a college student is a genius that gives the right answer 90% of the time (both for geniuses and non-geniuses). Suppose 1% of students are actually geniuses. If all college students are tested for geniusness, and your result comes back positive, what's the chance you actually are a genius?
7. Does Ioannidis' paper suggest that most scientific results were mistakes and/or should not be trusted?

Not be turned in: (you don't need to write up, but think about if you have time, and we may discuss in class)

8. Do you think Silver's treatment of Fisher and frequentism is a fair one?
9. Do you understand (at least roughly) what the standard statistical significance tests are? Do you agree with the idea that they should not be used or taught?