HW due 1-10-14 should be submitted electronically by Monday if you were late arriving to E.L.

The assignment and associated links to readings are found in the 481 syllabus at

http://www.stt.msu.edu/Academics/ClassPages/Default.aspx

Future work must be submitted in class and on time.

Your assignment due 1-17-14 now consists of two parts:

a. The assignment for 1-17-14 found in the syllabus.

b. Consult the passage of Ioannidis' paper entitled *Modeling the framework for false positive findings* found on pp.1-2.

**Submit your proof of a condition for PPV > 0.5 involving alpha, beta, and NO (see below), where PPV is the conditional probability**

\[
PPV = P(\text{hypothesis is true} \mid \text{hypothesis is judged true by a test with alpha, beta specified})
\]

Do it for the case of a hypothesis selected with equal probability from a pool of 1 correct hypothesis and NO (i.e. Nzero) incorrect hypotheses. For this setup the prior probability of choosing to test the single correct hypothesis is \(P(\text{select correct hypothesis}) = \frac{1}{N0+1}\).

Then the probability \(P(\text{select correct hyp to test and it is judged correct by the test})\) is given by

\[
\frac{1}{(N0 + 1)} \times P(\text{test judges the correct hypothesis is correct})
\]

Likewise, the probability \(P(\text{select an incorrect hyp and test judges it correct})\) is given by

\[
\frac{NO}{(N0+1)} \times P(\text{test judges the incorrect hyp is correct})
\]

**Note.** The paper defines \(R = \frac{\# \text{correct hypotheses}}{\# \text{incorrect hypotheses}}\) and claims that

\[
P(\text{select correct hypothesis}) = R \times (R+1).
\]

Verify you need not further employ \(R\) although you may chose to.

**Note.** Comment on whether the prior probability seems reasonable to you and why you feel the way you do. Is there a way to deal with small prior probability of a correct hypothesis being chosen to test without assuming a uniform selection?