Lones Smith due Mon., April 9, 2001

Econ 618: Assignment 4A

1. Assume the informational herding model with two-states and the classical unbounded uniform private beliefs structure in S/S: namely, $F^H(x) = x^2$ and $F^L(x) = 2x - x^2$. Assume payoffs $u_H^A = u_L^B = -1, u_H^B = u_L^A = 1$. Find the optimal value $V(\pi)$ of the one-shot informational herding problem as a function of the public beliefs π. [10 pts]

   Hint: Since you know that interval rules are optimal, the decision maker simply chooses a threshold, say $\bar{p} = \bar{p}(\pi)$, such that when private beliefs lie above $\bar{p}$, he takes the high action, and when private beliefs lie below $\bar{p}$, he takes the low action.

2. This concerns my "Informational Herding and Optimal Experimentation" paper with Peter.

   There are two periods and two states L and H. An experimenter observes a signal realization from the standard uniform full support signals with $F^H(x) = x^2$ and $F^L(x) = 2x - x^2$. He then takes an action A or B to maximize the payoff of his agent. That is, the professor is totally self-sacrificial, and naturally does not care about his own payoff; rather, his payoff is the agent's expected payoff. The experimenter and agent share a common prior π, and the professor knows that his student will have an opportunity to observe another conditionally iid signal (private belief) from the same distribution before taking his final action A or B. Assume the standard 'symmetric payoffs' above for the agent. [10 pts]

   (a) What is the optimal value of the professor, as a function of the prior π?

   Hint: In the last question, you unwittingly showed computed for agent who has a prior p (the public belief in this model), that he has an expected a payoff (optimal bellman value) of $1 - 2p + 2p^2$ ex ante to seeing his own private signal.

   (b) Why must it strictly exceed $1 - 2\pi + 2\pi^2$ when $\pi \in (0, 1)$?

   Hint: While this will not help you find the answer, when you do get it, it will be of the form $1 - 2\pi + 2\pi^2$ plus a positive term that is a fraction with a square root therein.