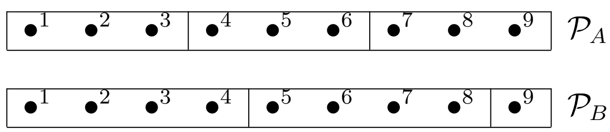
ECON 2200: Problem Set 4

Due 10/27/08

1. Find the set of rationalizable strategies in the "guess the average" game in which n players simultaneously choose a number in the set $\{1, 2, \ldots, K\}$ ($K \geq 3$), and a prize of \$1 is split evenly among the one or more players whose guesses are closest to two-thirds of the average of all guesses. Explain your reasoning carefully.

2. Find a two-player game with a correlated equilibrium in which every player gets less than her lowest Nash equilibrium payoff, or prove that no such game exists.

3. Consider an information partition model with state space $\Omega = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ and partitions for two agents, Ann and Bob, given below:



   Ann and Bob both attach prior probability of $\frac{1}{9}$ to each state $\omega \in \Omega$.

   (a) What are the agents' (subjective) probabilities for the event $E = \{3, 4\}$?

   (b) Suppose they take it in turns to announce these probabilities to each other, starting with Ann. After each announcement, the listener may learn something about which is the true state. If the true state is $\omega = 2$, write down the sequence of anouncements, and show that Ann and Bob eventually reach agreement.

   (c) Draw the partitions *after* they have reached agreement.

   (d) Is the event $F = \{1, 2, 3\}$ common knowledge once agreement about the probability of E has been reached? Explain briefly why or why not.

4. Let Ω be a finite set of states. Suppose there are two agents 1 and 2 with partitional information functions who have the same prior on Ω. Let ϕ be some random variable on Ω.

   (a) Show that it cannot be common knowledge between them that i's expectation of ϕ is greater than j's expectation of ϕ.

   (b) Show that it can be common knowledge between them that i's expectation of ϕ differs from j's expectation of ϕ.

   (c) Show by example that if the information functions are not partitional, then the claim in (a) may not hold.