PS/EC 172, SET 4
DUE FRIDAY, MAY 5TH AT 11:59PM
RESUBMISSION DUE FRIDAY, MAY 19TH AT 11:59PM

Collaboration on homework is encouraged, but individually written solutions are required. Also, please name all collaborators and sources of information on each assignment; any such named source may be used.

(1) Consider the following game played by n players who are sitting in a circle. Each player chooses one of two actions: X or Y. The players make this choice simultaneously. The payoff to a player is 0 if she chooses the same action as the person on her right, and 1 otherwise.
   (a) *15 points.* Let n be even. Find a pure Nash equilibrium or explain why none exist.

   (b) *15 points.* Let n be odd. Find a pure Nash equilibrium or explain why none exist.

   (c) *15 points.* Find a completely mixed Nash equilibrium for those values of n for which no pure one exists. What is the expected utility to each player?

   (d) *15 points.* For those values of n for which no pure Nash equilibria exist, find a correlated equilibrium in which the expected utility to every player is $1 - 1/n$.

(2) *40 points.* Construct an example of a knowledge space with two players, a finite set of states of the world, an event A and a state of the world ω such that $\omega \in K_1 A$, $\omega \in K_2 A$, $\omega \in K_1 K_2 A$, $\omega \in K_2 K_1 A$, but $\omega \notin K_1 K_2 K_1 A$. That is, at ω both players know that A has occured, both know that the other knows, but player 1 does not know that player 2 knows that player 1 knows that A has occured.

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