

SS 201A
FINAL EXAM

Collaboration is not allowed. You may consult the lecture notes, your own notes or any textbook, but not solutions to previous exams. There is no need to prove any statements that you make, unless this is explicitly requested (e.g., “explain...”), in which case you must provide an answer that is no longer than one paragraph. The exam is to be submitted by email by noon on Saturday, December 15th.

The Chandler Cafeteria has started offering *escargot*. Lewis and Clark are eager to try it, but both are afraid that it is awful. A-priori, there is a 10% chance that it is awful (A) and a 90% chance that it is good (G).

There are time periods $t \in \{0, 1, 2, \dots\}$, and in each time period they each have to simultaneously decide whether to eat (E) it or not (N). Once one of them has decided to eat it, the quality of the escargot is revealed to both and never changes.

The stage utility (at any period t) for taking action a with escargot of quality q is

$$u_t(a, q) = \begin{cases} 0 & \text{if } a = N \\ 1 & \text{if } a = E \text{ and } q = G \\ -40 & \text{if } a = E \text{ and } q = A \end{cases}$$

A player's total utility in the game is

$$(1 - \delta) \sum_{t=0}^{\infty} \delta^t u_t$$

for $\delta = 9/10$.

- (1) Explain why there are no equilibria in which neither of the players ever eat.
- (2) Find a pure Nash equilibrium in which Lewis's expected utility is higher than Clark's.
- (3) Find a symmetric mixed Nash equilibrium.
- (4) Find a symmetric correlated equilibrium in which the players' expected utilities are higher than in the symmetric mixed Nash equilibrium.