14.12 Game Theory
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Homework 2

Due on 10/3/2001 (in class)

1. Consider the following game:

1\2	L	R
T	$(1,1)$	$(1,0)$
B	$(0,1)$	$(0,10000)$

   (a) Compute the rationalizable strategies.

   (b) Now assume that players can tremble: when a player intends to play a strategy s, with probability $\epsilon = 0.001$, nature switch to the other strategy s', when s' is played. For instance, if player 2 plays L (or intends to play L), with probability ϵ L is played, with probability $1-\epsilon$, R is played. Compute the rationalizable strategies for this new game.

   (c) Discuss your results (briefly).

2. Compute all the Nash equilibria of the following game.

	L	M	R
A	$(3,1)$	$(0,0)$	$(1,0)$
B	$(0,0)$	$(1,3)$	$(1,1)$
C	$(1,1)$	$(0,1)$	$(0,10)$

3. Compute the pure-strategy Nash equilibria in the following linear Cournot oligopoly for arbitrary n firms: each firm has marginal cost $c > 0$ and a fixed cost $F > 0$, which it needs to incur only if it produces a positive amount; the inverse-demand function is given by $P(Q) = \max\{1 - Q, 0\}$, where Q is the total supply.

4. A group of n students go to a restaurant. It is common knowledge that each student will simultaneously choose his own meal, but all students will share the total bill equally. If a student gets a meal of price p and contributes x towards paying the bill, his payoff will be $\sqrt{p} - x$. Compute the Nash equilibrium. Discuss the limiting cases $n = 1$ and $n \to \infty$.