Final Exam: Economics 101

READ THE INSTRUCTIONS:

You have three hours. Do all 5 questions; each has equal weight. Please write answers in the space provided on this exam. Use the back of the pages if you need more room, but clearly mark where the problem continues. You will get credit *only if you provide a clear explanation of your answer and how you got it*. Write only on the exam sheet and only using pen; cross out any scratch work. Calculators are not allowed, rulers are OK. Good luck.

December 14, 1998 © David K. Levine

Name:

Student ID:

Section:

Question	Score	Possible
1.		20
2.		20
3.		20
4.		20
5.		20
Total		100

Source: \Docs\Annual\98\CLASS\101\SPRING\s98-FINAL.DOC

1. Normal Form Games

In each of the following games
i) Find all of the pure strategy Nash equilibria.
ii) Determine whether or not there is a mixed strategy Nash equilibrium (in addition to the pure equilibria which are also considered mixed), and if so, what it is.
iii) Which of these equilibria are Pareto efficient?
iv) Do any of the pure strategy equilibria involve playing weakly or strictly dominated strategies?
v) Sketch the socially feasible set.
vi) Find a pure strategy that maximizes the payoff each player is guaranteed no matter how the other player plays (this is called the maxmin payoff). Also find a pure strategy that minimizes the payoff the other player can get (this is called the minmax payoff). Sketch the corresponding socially feasible individually rational set. This should be done on the same graph as in part (v).
a)

	L	R
U	5,5	0,6
D	6,0	1,1

b)

	L	R
U	0,0	-1,-100
D	-100,-1	10,10

c)

	L	C	R
U	1,1	2,0	0,2
M	0,2	1,1	2,0
D	2,0	0,2	1,1

2. Repeated Games

	L	R
U	7,4	2,6
D	9,2	3,3

Suppose that this stage game is repeated between two infinitely lived players with discount factor equal to δ. Propose a strategy and a discount factor δ such that the Nash equilibrium outcome of the game is for both players to play UL. Are these strategies subgame perfect? What does the Folk Theorem tell us about this game?

3. Long Run versus Short Run

Maria must decide whether to order a CD from CDsRUS a new online company. After she places the order, CDsRUS must decide whether or not to send her the CD she ordered, or abscond with the money. Maria pays $12 for the CD; if she receives it, it is worth $15 to her. It costs CDsRUS $3 to ship the CD. If she doesn't order the CD everyone gets 0.

a) Find the extensive and normal form of this game.
b) What pure strategy Nash equilibria are in the stage game; which are subgame perfect?
c) What is the Stackelberg equilibrium of the stage game in which CDsRUS moves first?
d) Suppose that this stage game is repeated: CDsRUS is infinitely lived with discount factor equal to δ and there is a sequence of short-lived consumers (Maria and her friends). Propose a strategy and a discount factor δ such that in equilibrium players end up playing the Stackelberg equilibrium.
e) What difference would reputation make in the repeated case?

4. Decision Analysis

An actress, Ms. Anna Flechette, must decide whether or not to have plastic surgery. If she does not have the surgery, she will earn $10,001,000 over her lifetime. If she does have the surgery and her fans like the enhancements, she will earn instead $30,001,000 over her lifetime, however if they do not, she will have to work the rest of her life at a fast-food franchise, and earn only $1,000. There is a 50% chance the fans will like the enhancements, and Ms Flechette is not the least bit risk averse.

a)   Should she have the surgery?

b)   How much should she pay for a marketing study to better understand her fans preferences?   The survey will give either a thumbs up or thumbs down for the surgery; if the fans like the enhancements, there is a 10% chance the survey will give a thumbs down; while if they do not, there is only a 5% chance the survey will give a thumbs up.

5. Cournot with Uncertain Cost

Consider a Cournot Duopoly with demand $p = 17 - x$. There are two possible levels of marginal cost: low and equal to 1 or high and equal to 3. There is a 20% chance both firms are high cost, a 20% chance they are both low cost, a 30% chance firm 1 is high cost and firm 2 low cost, and a 30% chance firm 1 is low cost and firm 2 high cost. Assuming that each firm knows its own marginal cost and these probabilities, what are the equilibrium strategies of the two firms in the Bayesian Nash equilibrium of the Cournot

Game? Please note that you must use conditional probabilities to correctly solve this problem. Compare industry output with the case in which both firms know their rivals (and their own) cost before they choose their level of output?

6. Class Commentary

There are several aspects of this class that are experimental. Comments are much appreciated.

(a) In the past, Economics 101 has been taught in a number of lectures of about 100 students and large sections rather than a single large lecture of 250 students and small sections. How do you feel about the two formats? Bear in mind that with many lectures you have some flexibility to choose the professor you want, but are more likely to be taught by a visitor rather than regular faculty member.

(b) How do you feel about having the exam directly on the exam sheet rather than doing it in bluebooks?

Extra Sheet – Clearly label problem numbers.