Midterm Exam Answers: Economics 101

May 8, 1998 © David K. Levine

1. Short Answers

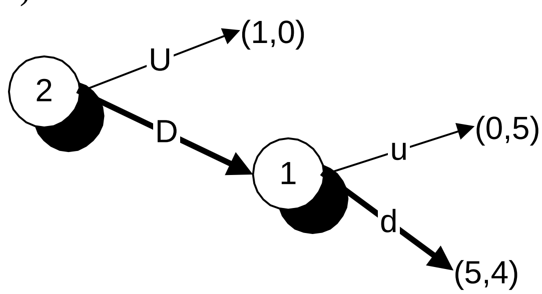
a)

	L	R
U	10*,5*(not efficient)	11,0
D	5,3	12*,5*(efficient)

b)

	L	R
U	3,1	2*,9*(efficient)
D	7*,-1*(efficient)	1,-3

c)

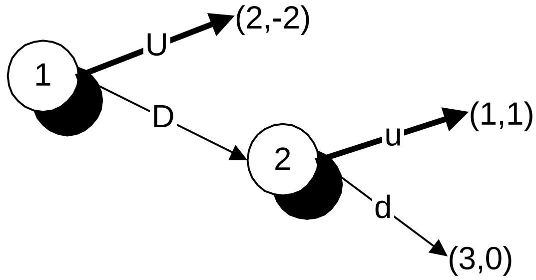


subgame perfect equilibrium (D,d) is efficient

normal form

	U	D
u	1*,0	0,5*
d	1*,0	5*,4* (efficient)

Note that there is only one Nash equilibrium and it is also subgame perfect d)



subgame perfect equilibrium of U,u is inefficient

normal form

	u	d
U	2*,-2*	2,-2*
D	1,1*	3*,0

The Nash equilibrium is the same as the subgame perfect equilibrium.

2. Hotelling Duopoly

a) For given prices p_1, p_2 of the two stores, which location is exactly indifferent between the stores? $-p_1 - x = -p_2 - (1-x)$ so $x = (p_2 - p_1 + 1)/2$

b) What is the demand for Marty's groceries? $x = (p_2 - p_1 + 1)/2$ For Ginnie's? $1 - x = 1 - (p_2 - p_1 + 1)/2 = (p_1 - p_2 + 1)/2$

c) What are the Nash equilibrium prices of the price-setting game?

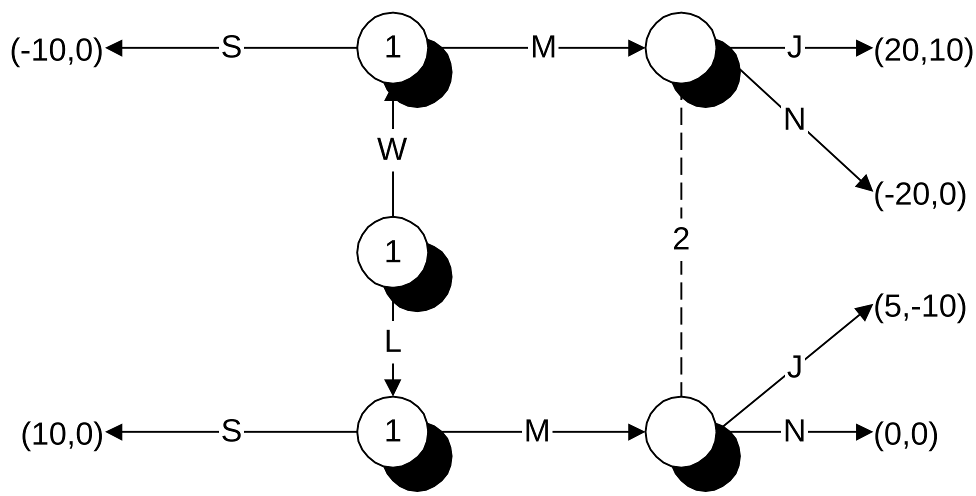
Marty's profit $(p_1 - 2)(p_2 - p_1 + 1)/2$ maximized when $(p_2 - p_1 + 1)/2 - (p_1 - 2)/2 = 0$ or $p_2 - 2p_1 + 3 = 0$

Ginnie's profits $(p_2 - 1)(p_1 - p_2 + 1)/2$ maximized when $(p_1 - p_2 + 1)/2 - (p_2 - 1)/2 = 0$ or $p_1 - 2p_2 + 2 = 0$, or $p_1 = 2p_2 - 2$

Plug in to Marty's FOC and find $p_2 - 2(2p_2 - 2) + 3 = 0, p_2 = 7/3$. Plug into Ginnie and find $p_1 = 8/3$.

3. How to get a job?

a) Find the extensive form of this game.



b) Find normal form of this game. Find all Nash equilibria of this game.

c) Which of the Nash equilibria are Pareto Efficient and which are not?

	J	N
W,S	-10,0*	-10,0*
W,M	20*,10*(efficient)	-20,0
L,S	10,0*	10*,0*
L,M	5,-10	0,0*

d) Apply the theory of iterated weak dominance to this game.

No dominance for player 2

For player 1, L,M and W,S are strictly dominated by L,S

The reduced game is below

	J	N
W,M	20*,10*(efficient)	-20,0
L,S	10,0*	10*,0*

Now J *weakly* dominates N giving

	J
W,M	20*,10*(efficient)
L,S	10,0*

Finally, W,M strictly dominates L,S, leaving just the efficient Nash equilibrium.