Midterm Exam Answers: Economics 101

November 16, 1998 © David K. Levine

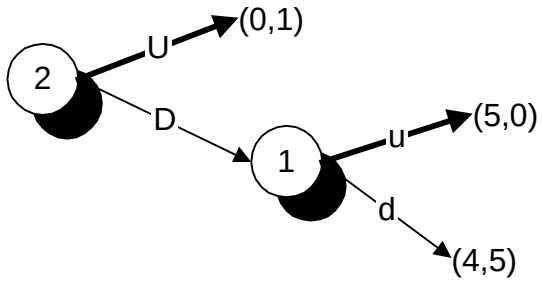
1. Short Answers

	L	R
U	2,2	1*,6*(efficient)
D	6*,1*(efficient)	0,0

b)

	L	R
U	5*,5*(not efficient)	6,0
D	0,3	7*,5*(efficient)

c)



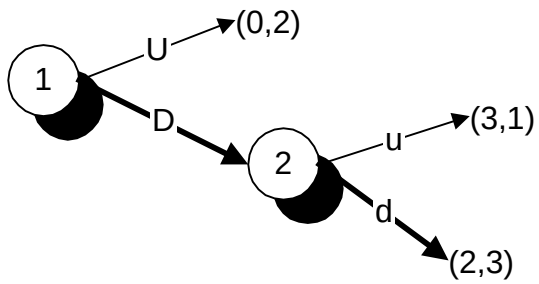
subgame perfect equilibrium (U,u) is inefficient

normal form

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

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

d)



subgame perfect equilibrium of D,d is efficient

normal form

	u	d
U	0,2*	0,2*
D	3*,1	2*,3*(efficient)

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

2. Cournot Duopoly with Differential Marginal Cost

Profit for big bad Bill (firm 1)

$\pi_1 = (17 - x_1 - x_2)x_1 - x_1 = (16 - x_1 - x_2)x_1$; FOC $16 - 2x_1 - x_2 = 0$

Profit for sad sorry Steve (firm 2)

$\pi_2 = (17 - x_1 - x_2)x_1 - 3x_2 = (14 - x_1 - x_2)x_1$; FOC $14 - x_1 - 2x_2 = 0$

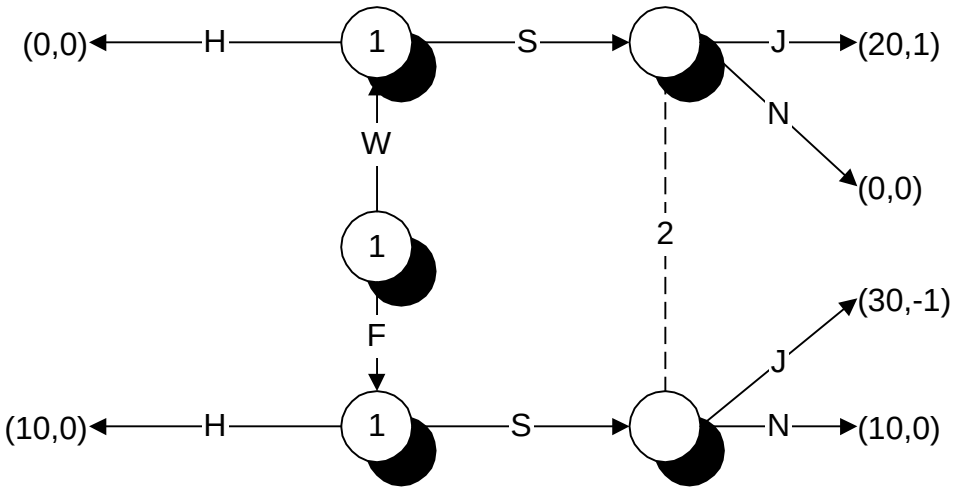
from Steve's FOC $x_1 = 14 - 2x_2$ plug in Bill's FOC to get

$16 - 2(14 - 2x_2) - x_2 = 0; 3x_2 = 12; x_2 = 4$

so $x_1 = 6,\ x = 10,\ p = 7,\ \pi_1 = 36, \pi_2 = 16$

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,H	0,0*	0,0*
W,S	20,1*	0,0
F,H	10,0*	10*,0*(inefficient)
F,S	30*,-1	10*,0*(inefficient)

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

No dominance for player 2

For player 1, W,H and W,S are strictly dominated by F,S, and F,S weakly dominates F,H

The reduced game is below

	J	N
F,S	30*,-1	10*,0*(inefficient)

Eliminating J leaves just one of the two inefficient Nash equilibrium.