# 12 Extra Problems

Monday, March 22, 2021 5:38 PM

Submit your analysis of the game below from class.

Amy is considering introducing a new product line. So is Bob.

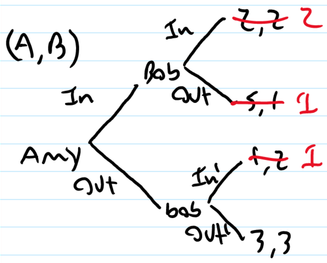
If both do so, both make $2.

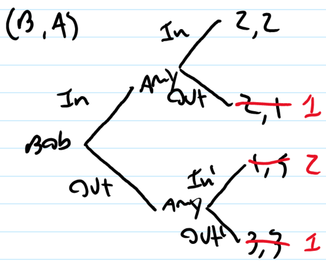
If neither does so, both make $3.

If Amy does and Bob does not, Amy makes $5 and Bob makes $1.

If Bob does so and Amy does not, Amy makes $1 and Bob makes $2.

Analyze the role of the timing of moves in this game. Use the extensive form to analyze the two sequential mover versions. That is, solve the game for all three possible order of moves and then discuss which order you think is likely to emerge in such games. Explain why.

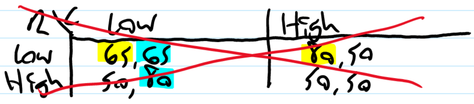

Amy should move first. If Bob goes first, he'll choose out (3,3) but then Amy will go in (1,5). If Amy moves first, she'll choose in (5,1) but then Bob will also choose in (2,2).

Submit your analysis of the game below, which we will work in class.

Both Roger and Cindy each have 50 loyal customers that buy whether price is low, $15, or high, $20. There are 30 price sensitive customers. Price sensitive customers buy only if there is a low price, and from whoever has the low price. If Roger and Cindy both have a low price, they split the price sensitive customers. Cost is $5 per unit. 100 total

Find all NE of this simultaneous move game. That is, find the pure strategy NE, if any. Then, find the mixed strategy NE, if any. What is expected profit for each player in the mixed strategy NE, if there is one? If there is a mixed strategy NE, can you explain what is going on in intuitive terms?

If prices were set sequentially, would there be a first or second mover advantage? Or both? Does that even seem like a reasonable question to ask in this case? How so? How not so?




→ Prob
→ Prob

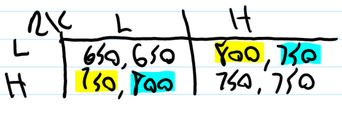
$\pi_L = 15L - 5L = 10L$

$\pi_H = 20H - 5H = 15L$

Cindy

$U_L = 65q + 80(1-q)$ = $U_H = 50q + 50(1-q)$

$U_L = 65q + 80(1-q)$ = $U_H = 75q + 75(1-q)$




→ (row, column)

Cindy Low

$750 = 650q + 800(1-q) \Rightarrow q = 1/3$

High $q = 2/3$

There is a first mover advantage because they can establish that they will go low. The first mover will go low and then the second will go high so that the payoffs are (800, 750)

$E(\pi) = \frac{4}{9}750 + \frac{2}{9}750 + \frac{2}{9}800 + \frac{1}{9}650 =$