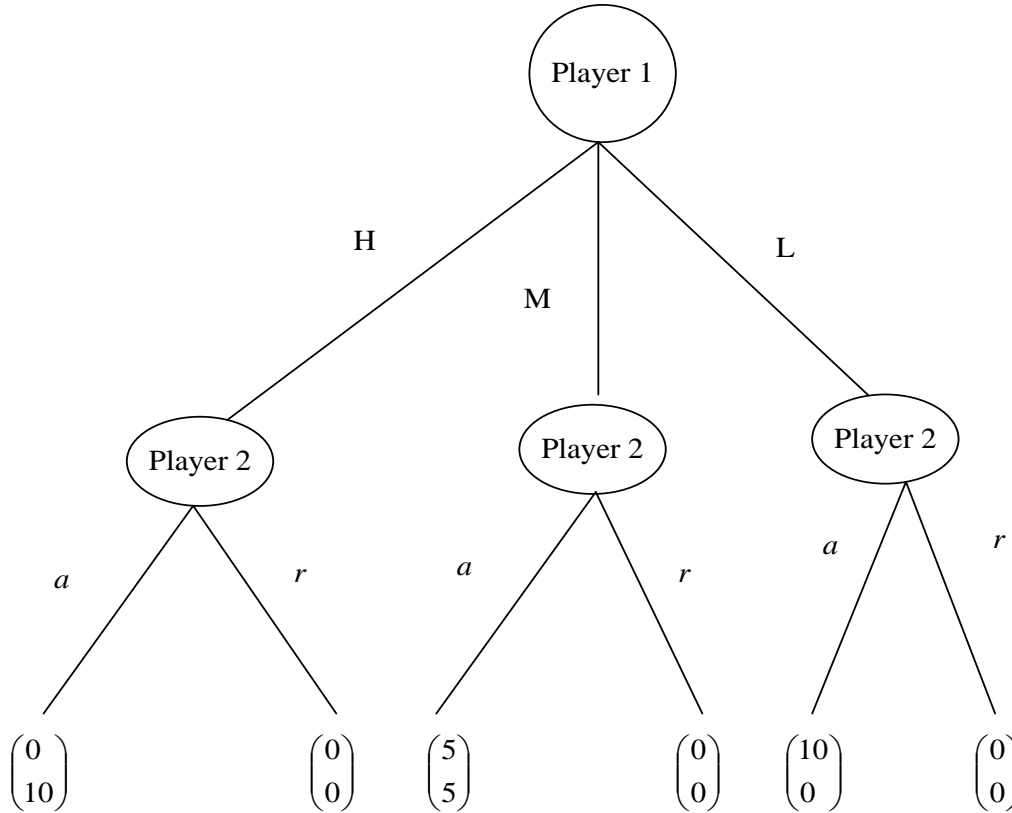


ECONS 424 -STRATEGY AND GAME THEORY
HOMEWORK #1 – DUE DATE: MONDAY, JANUARY 22ND, IN CLASS

Exercise 1 –From extensive form to normal form representation

Consider the following extensive form game



- Which are the strategies for player 1?
- What are the strategies for player 2?
- Take your results from a) and b) and construct a matrix representing its normal form game representation.

Exercise 2 – Iterated Deletion of Strictly Dominated Strategies (IDSDS)

Consider the following normal form game

		Player 2	
		L	R
Player 1	U	-10,-10	0,12
	C	-12,0	2,2
	D	-9,0	1,0

- Find strictly dominant strategies (if any) for player 1 and for player 2.
- Find strictly dominated strategies (if any) for player 1 and for player 2.

- c) If you apply iterative deletion of strictly dominated strategies (IDSDS), what is the surviving strategy pair (or pairs)? Explain the steps you use in IDSDS, and why you use them.

Exercise 3 – Unemployment benefits.

Consider the following simultaneous-move game between the government (row player), which decides whether to offer unemployment benefits, and an unemployed worker (column player), who chooses whether to search for a job. As you interpret from the payoff matrix below, the unemployed worker only finds it optimal to search for a job when he receives no unemployment benefit; while the government only finds it optimal to help the worker when he searches for a job.

		Worker	
		<i>Search</i>	<i>Don't search</i>
Government	<i>Benefit</i>	3,2	-1,3
	<i>No benefit</i>	-1,1	0,0

- a) Represent this game in its extensive form (game tree), where the government acts first and the worker responds without observing whether the government offered unemployment benefits.
 b) Does player 1 has strictly dominant strategies? What about player 2?
 c) Find which strategy profile (or profiles) survive the application of IDSDS.

Exercise 4 – Pure strategies that are only strictly dominated by a mixed strategy

Consider the following normal form game

		Player 2	
		<i>Left</i>	<i>Right</i>
Player 1	<i>Up</i>	4,1	0,2
	<i>Middle</i>	0,0	4,1
	<i>Down</i>	1,3	1,2

- a) Is there some strictly dominated strategy for player 1 involving only the use of pure strategies?
 b) Is there some strictly dominated strategy for player 1 when mixed strategies are allowed? [*Hint: you may assign probabilities to two of her strategies, similarly as we did in class*].
 c) Delete the strictly dominated strategies for player 2 that you found in the previous question. Then, represent the remaining (undeleted) strategies.
 d) Proceed with IDSDS. What is the strategy pair surviving IDSDS?

Exercise 6 (Bonus exercises):

1. Exercise 10 from Chapter 3 in Harrington.
2. Exercise 11 from Chapter 3 in Harrington.