

Econ 308 Homework # 1

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1. There are three players: Candidate 1 (Player C1), Candidate 2 (Player C2), and a Voter (Player V). There are two steps. At Step 1 Candidates 1 and 2 *simultaneously* announce their position on the political spectrum. For simplicity suppose that there are only three positions L, M, and R. At Step 2 the Voter observes the announced positions of both candidates and chooses (i.e. elects) either Candidate 1 (strategy S1) or Candidate 2 (strategy S2). The payoffs are determined as follows:

- Both candidates simply care for being elected. If they get elected their payoff is 3 and otherwise their payoff is 0.
- The payoff of the voter depends on the elected candidate as well as his announced position:
 - The favorite position of the voter is M. If the announced position of the elected candidate is M then the voter gets a payoff of 2. Otherwise (i.e. if the announced position of the elected candidate is L or R) then her payoff is 0.
 - The Voter has a bias towards Candidate 1 and hence she gets an *additional* payoff of 1 if Candidate 1 is elected.

Represent this scenario as an extensive form game. Please do not solve the game.

2. Consider the following scenario: There are 2 players and 3 steps:

Step 1: The nature (i.e. the chance) chooses between three states L, M, and R with even probability. When that happens

- Player 1 observes nature's choice whenever it is L but cannot observe it whenever it is M or R, and
- Player 2 observes nature's choice whenever it is R but cannot observe it whenever it is L or M.

Step 2: Player 1 chooses between L, M, and R.

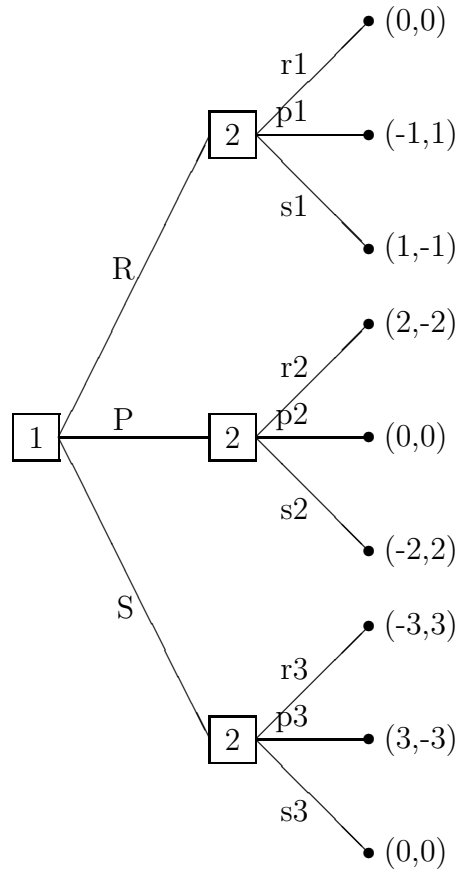
Step 3: Player 2 observes Player 1's choice and chooses between L, M, and R.

The payoffs are determined as follows: Each player gets a payoff of 2 if the other player *does not* announce the true state and an *additional* payoff of 1 if he/she announces the true state.

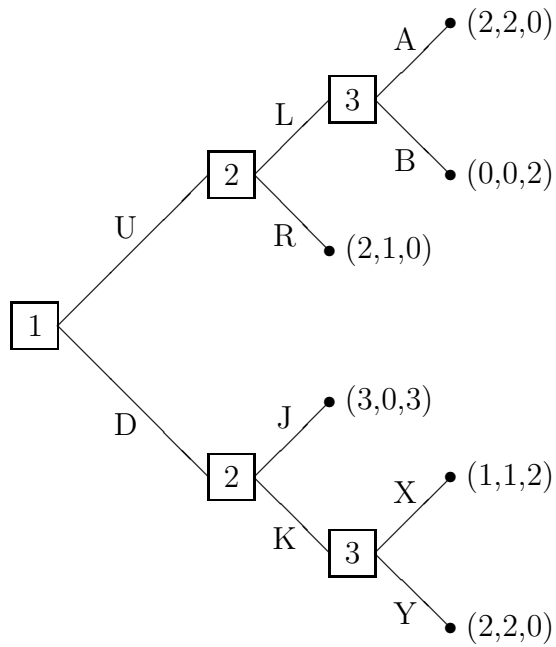
Represent this scenario as an extensive form game. Please do not solve the game.

3. Solve the following games with backwards induction. Give the equilibrium strategies as well as equilibrium payoffs.

(a)



(b)



4. Find the dominant and dominated strategies in the following games (in case players have such strategies). Is there any dominant strategy equilibrium in any of these games?

(a)

		Player 2	
		L	R
Player 1	U	1,5	0,3
	D	2,3	1,1

(b)

				P3	
		A			B
		P2		P2	
		L	R	L	R
P1	U	3,3,3	1,1,1	2,0,3	0,2,0
	M	2,0,2	3,5,4	4,2,1	1,0,3
	D	2,3,1	2,1,2	2,3,1	0,3,0

(c)

		Player 2				
		V	W	X	Y	Z
Player 1	A	3,0	3,3	2,3	2,2	2,1
	B	4,4	3,2	3,3	1,1	3,0
	C	5,2	3,1	3,2	2,2	3,2
	D	5,0	2,2	3,3	0,0	3,0
	E	5,3	1,1	1,1	2,2	1,1

5. Solve the following games with iterated elimination of dominated strategies. Indicate the order of elimination and at each step explain why these strategies are eliminated (i.e. indicate which strategy dominates/dominates them).

(a)

		Player 2	
		L	R
Player 1	U	2,2	0,0
	D	3,0	1,2

(b)

		P2	
		L	R
P1	U	4,4	6,4
	M	5,5	5,3
	D	6,5	4,4

(c)

		Player 2				
		V	W	X	Y	Z
Player 1	A	1,5	3,4	2,5	1,3	6,2
	B	0,1	4,1	1,1	4,1	0,1
	C	2,1	3,5	3,3	2,3	1,3
	D	4,1	2,2	4,1	2,3	5,0
	E	1,5	2,2	4,2	1,2	5,2