Eco 311/511: Game Theory
Practice Quiz 1 (ungraded)

September 13, 2023

Instructions: (i) Answer all questions. (ii) The quiz will be scored and returned to you. The scores will not count towards the final grade. (iii) Wherever asked for an explanation, try to give a formal mathematical proof. Time: 1 hour.

1. Write down the mixed extension of the following game in strategic form and find all Mixed Strategy Nash Equilibria. (1+3)

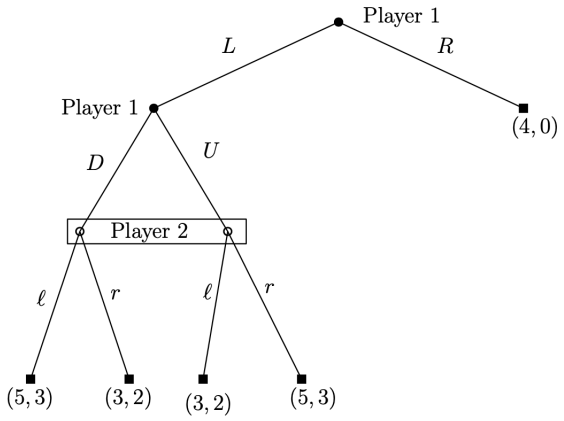
Player 2

Player 1		A	B
	A	(1,1)	(3,1)
	B	(1,3)	(4,4)

2. (a) "In Prisoner's Dilemma game, at least one player will assign positive probability to the action 'don't confess' in any mixed strategy Nash equilibrium." Is this statement true or false? Provide a brief explanation. (2)

   (b) Can a weakly dominated action be a never-best response? Provide a short formal proof/explanation. (3)

3. Write the set of strategies for the two players in the given game. Find the subgame perfect equilibria if player 2 can observe player 1's actions before making his move. Write down the game in strategic form (matrix form) if player 2 can only observe the first action taken by player 1 i.e. between L, R and not the 2nd action i.e. D or U. Is the set of Pure Strategy Nash Equilibria in this case and SPE you found in the previous case the same? (1+2+2+1)



4. Consider an auction of a commodity with n bidders. Suppose each bidder i submits a sealed bid b_i and has a valuation (v_i) of the commodity that is known only to himself. Suppose the auctioneer assigns the object to the highest bidder and the bidder has to pay the exact amount he bids. Represent the auction as a strategic form game. Is bidding v_i a weakly/strictly dominant strategy? Provide a formal proof in support of your answer. Find atleast one Nash equilibrium of this game. (2+3)