Advanced Microeconomics, Spring 2024

Problem set 2, due April 11

1. Consider the two-player game whose extensive form representation (excluding payoffs) is depicted in Figure 1.

   (a) Show that for any behavior strategy that player 1 might play, there is a realization equivalent mixed strategy; that is, a mixed strategy that generates the same probability distribution over the terminal nodes for any mixed strategy choice by player 2.

   (b) Show that the converse is also true: For any mixed strategy that player 1 might play, there is a realization equivalent behavior strategy.

   (c) Suppose that we change the game by merging the information sets at player 1's second round of moves (so that all four nodes are now in a single information set). Which of the two results in (b) and (c) still holds?

2. For the game given below:

		Player 2			
		B1	B2	B3	B4
Player 1	A1	(0, 6)	(3, 1)	(2, 0)	(3, 7)
	A2	(1, 0)	(9, 4)	(0, 12)	(1, 1)
	A3	(0, 0)	(10, -1)	(2,-3)	(0, 1)
	A4	(7, 3)	(0, 0)	(5, 1)	(-1, 2)
	A5	(2, 8)	(-2, 1)	(3, 1)	(1, 0)

   (a) Does any player have any dominated strategies? If yes, what are they?

   (b) Find all pure strategy NE of the game.

   (c) Does the game have any mixed strategy NE? If yes, please find the mixed strategy NE.

3. For the game depicted in Figure 2:

   (a) Determine all SPNE of this game;

   (b) Determine all (pure strategy) sequential equilibrium of this game.

4. For the game depicted in Figure 3:

   (a) Determine all pure strategy normal-form perfect equilibrium of this game;

(b) Determine all pure strategy sequential equilibrium of this game.

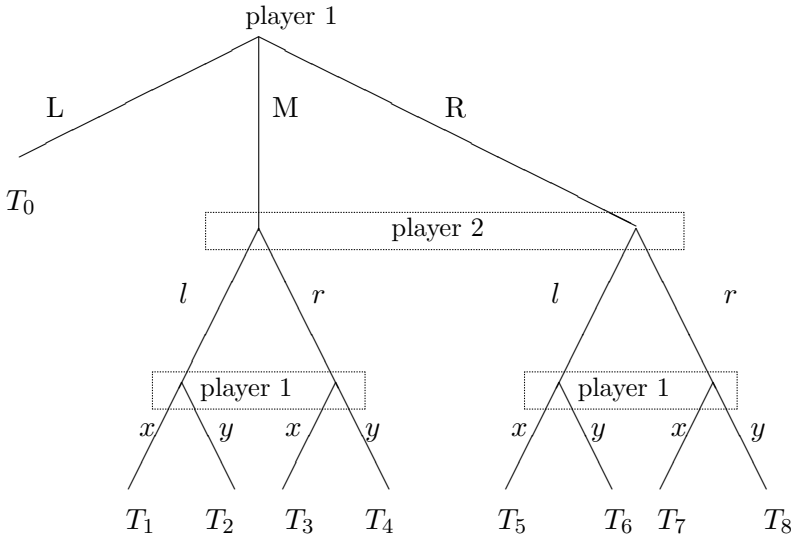

Figure 1

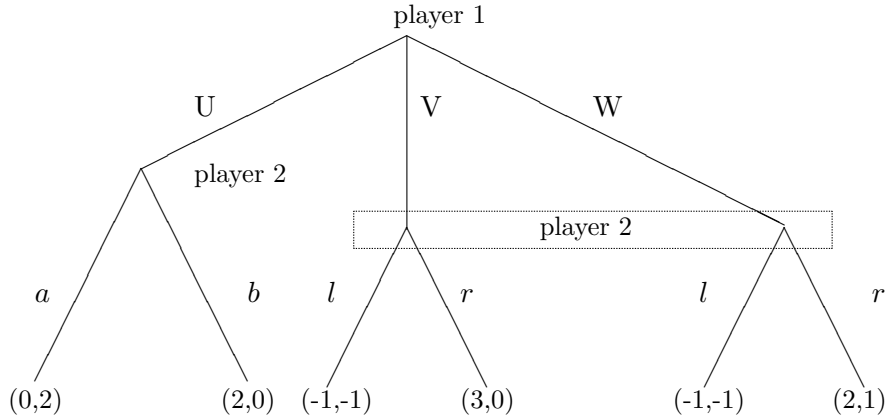

Figure 2

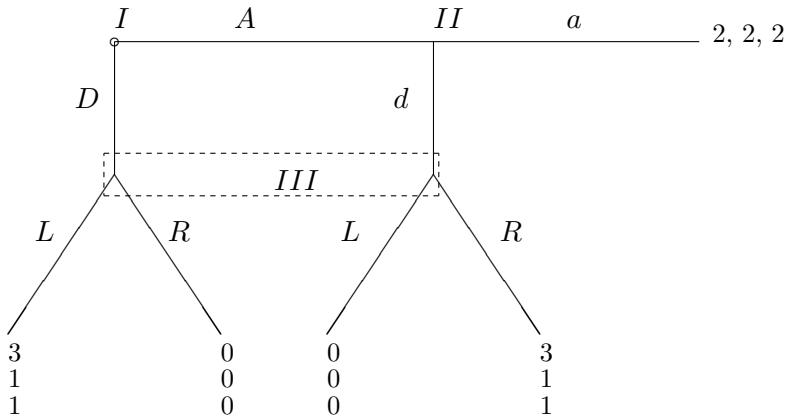

Figure 3