POLI 388 due 03/22/10

PROBLEM SET #2 – STRATEGIC CHOICE IN TWO-PLAYER GAMES

1. Answer the following questions pertaining to the two-player *zero-sum* game depicted in the payoff matrix below. *Briefly explain each of your answers*. (The row Player 1 has four strategies; the column Player 2 has three strategies. The number in each cell is the payoff to Player 1; the payoff to Player 2 is the negative of the number — that is, P1 wants to maximize ands P2 wants to minimize, the payoff.)

		Player 2		
		c_1	c_2	c_3
Player 1	s_1	4	2	3
	s_2	2	1	3
	s_3	4	3	3
	s_4	3	2	4

(1) Does this payoff matrix have a Nash equilibrium?

(2) Is this zero-sum game *strictly determined*?

(3) Would either player choose to use a mixed strategy?

(4) Would the outcome be different if the game were played sequentially, with P1 making the first move?

(5) Would the outcome be different if the game were played sequentially, with P2 making the first move?

(6) Supposing that the players make their strategic choices *sequentially* with Player 1 moving first, could Player 2 *communicate any pre-play message* to Player 1 that might improve the outcome for Player 2.

(7) Supposing that the players make their strategic choices *sequentially* with Player 2 moving first, could Player 1 *communicate any pre-play message* to Player 2 that might improve the outcome for Player 1.

3. Answer the following questions pertaining to the two-player *zero-sum* game depicted in the payoff matrix below. *Briefly explain each of your answers*. (The row Player 1 has four strategies; the column Player 2 has three strategies. The number in each cell is the payoff to Player 1; the payoff to Player 2 is the negative of the number — that is, P1 wants to maximize ands P2 wants to minimize, the payoff.)

		Player 2		
		c_1	c_2	c_3
Player 1	s_1	6	3	0
	s_2	5	0	2
	s_3	3	2	3
	s_4	4	4	1

(1) Does this payoff matrix have a Nash equilibrium?

(2) Is this zero-sum game *strictly determined*?

(3) Would either player choose to use a mixed strategy?

(4) Would the outcome be different if the game were played sequentially, with P1 making the first move?

(5) Would the outcome be different if the game were played sequentially, with P2 making the first move?

(6) Supposing that the players make their strategic choices *sequentially* with Player 1 moving first, could Player 2 *communicate any pre-play message* to Player 1 that might improve the outcome for Player 2.

(7) Supposing that the players make their strategic choices *sequentially* with Player 2 moving first, could Player 1 *communicate any pre-play message* to Player 2 that might improve the outcome for Player 1.

3. Answer the following questions pertaining to the (variable-sum) game depicted in the payoff matrix. *Then briefly explain each of your answers.* (Each player has just two strategies. The number in lower-left corner of each cell is the payoff to Player 1; the number in the upper-right corner of each cell is the payoff to Player 2. Each player is trying to maximize his payoff.)

Player 2

Player 1		c_1	c_2
	s_1	3 5	2 2
	s_2	4 3	5 3

(1) What do you expect the outcome of the game to be if the players must make their strategic choices *simultaneously* (not knowing what choice the other is making)?

(2) What do you expect the outcome of the game to be if the players make their strategic choices *sequentially*, with *Player 1 moving first* and Player 2 second?

(3) What do you expect the outcome of the game to be if the players make their strategic choices *sequentially*, with *Player 2 moving first* and Player 1 second?

(4) Supposing that the players make their strategic choices *sequentially* with Player 1 moving first, could Player 2 *communicate any pre-play message* to Player 1 that might improve the outcome for Player 2.

(5) Supposing that the players make their strategic choices *sequentially* with Player 2 moving first, could Player 1 *communicate any pre-play message* to Player 2 that might improve the outcome for Player 1.

4. Answer the following questions pertaining to the (variable-sum) game depicted in the payoff matrix. *Then briefly explain each of your answers.* (Each player has just two strategies. The number in lower-left corner of each cell is the payoff to Player 1; the number in the upper-right corner of each cell is the payoff to Player 2. Each player is trying to maximize his payoff.)

Player 2

Player 1		c_1	c_2
	s_1	3 5	2 2
	s_2	5 3	4 3

(1) What do you expect the outcome of the game to be if the players must make their strategic choices *simultaneously* (not knowing what choice the other is making)?

(2) What do you expect the outcome of the game to be if the players make their strategic choices *sequentially*, with *Player 1 moving first* and Player 2 second?

(3) What do you expect the outcome of the game to be if the players make their strategic choices *sequentially*, with *Player 2 moving first* and Player 1 second?

(4) Supposing that the players make their strategic choices *sequentially* with Player 1 moving first, could Player 2 *communicate any pre-play message* to Player 1 that might improve the outcome for Player 2.

(5) Supposing that the players make their strategic choices *sequentially* with Player 2 moving first, could Player 1 *communicate any pre-play message* to Player 2 that might improve the outcome for Player 1.