Game Theory: In-class Quiz 1
Fall 2024

Student ID:

Name:

Instructions

1. Do NOT flip over this page until every student received this quiz. Your TA will let you know when you can start.

2. During this closed-book quiz, you cannot consult any materials.

3. If you are unable to explain your reasoning in English, it is okay to write in Korean.

4. Should you need more spaces, use the backside of the page, with clearly indicating the relevant quiz number.

Honor Code: Cheating on exams or quizzes, plagiarizing someone else's answers as one's own, or any other instance of academic dishonesty violates the standards of academic integrity.

Confidentiality Code: Sharing the information of the exam or quiz contents with other students in any form and medium is strongly prohibited, as it raises information inequity.

I, _____, consent to the Honor Code and the Confidentiality Code.
      (write your name)

1. Examine whether pure-strategy Nash equilibria exist for the following games, and if so, find all pure-strategy Nash equilibria.

(a)

Sally \ Harry	Museum	Theater	Stadium
Museum	3, 3	0, 2	1, 0
Theater	0, 0	2, 1	0, 0
Stadium	1, 0	2, 3	2, 2

(b)

Pitcher \ Hitter	Swing Early	Swing Late
Fastball	40, 60	90, 10
Changeup	70, 30	25, 75

(c)

Incumbent \ Challenger	Fight	Chill out
Fight	0, 0	4, 2
Chill out	2, 4	3, 4

(d)

Firm 1 \ Firm 2	Open a new plant	Not open it
Open a new plant	1, 1	3, 0
Not open it	0, 3	2, 2

(e)

Radio Channel 1 \ Channel 2	Rock	Pop	Metal
Rock	2, 4	5, 1	4, 5
Pop	4, 7	4, 5	2, 6
Metal	5, 5	8, 6	3, 3

2. Consider the game below:

Player 1 \ Player 2	Left	Right
Left	3, 3	1, 4
Right	4, 1	1, 1

Which of the following outcomes is Pareto optimal? (circle all that apply: There might be more than one, or none.)

(a) (3, 3)

(b) (1, 4)

(c) (4, 1)

(d) (1, 1)

3. Consider the game below:

P1 \ P2	Left	Right
Up	2, 3	0, 0
Down	0, 0	X, 2

, where X is a number greater than 1.

(a) Find a mixed strategy Nash equilibrium where P1 plays U with probability $p \in (0, 1)$ and P2 plays L with probability $q \in (0, 1)$.

(b) In the mixed-strategy Nash equilibrium you found in (a), how do p and q change as X increases?