تمرین‌های سری ۴

زمان تحویل: چهارشنبه ۱۳۹۸/۱۲/۲۸ ساعت ۸ صبح

Chapter 8: MWG Exercises 8.D.7a, 8.E.1

Additional Exercise 1: (Nash reversion pure strategy folk theorem)
Consider an infinitely repeated game $G(\infty, \delta)$. Suppose that pure strategy profile $a \in A$ is a Nash equilibrium of G. Suppose also that $a' \in A$ is a pure strategy profile such that $u_i(a') > u_i(a)$ for every player i. Show that there exists $\underline{\delta} \in (0,1)$ such that if $\delta > \underline{\delta}$, then there is a subgame perfect equilibrium σ of $G(\infty, \delta)$ for which $u_i(\sigma) = u_i(a')$ for all i.

Additional Exercise 2: Consider the infinitely repeated game $G(\infty, \delta)$ based on the stage game below. Use the principle of optimality to find the set of discount factors for which the following strategy profile is a subgame perfect equilibrium: 1) in period 1 Player i plays a_i; 2) in every period after period 1, Player i plays b_i if (b_1, b_2) or (c_1, c_2) was played in the previous period; and 3) in every period after period 1, Player i plays c_i if (b_1, b_2) or (c_1, c_2) was not played in the previous period.

		Player 2		
		a_2	b_2	c_2
	a_1	4, 4	3, 2	1, 1
Player 1	b_1	2, 3	2, 2	1, 1
	c_1	1, 1	1, 1	-1, -1

Additional Exercise 3: (Repeated Prisoners' Dilemma) Consider the following stage game G:

		Player 2	
		C	D
Player 1	C	-1, -1	-4, 0
	D	0, -4	-3, -3

a) Show that the finitely repeated game $G(T, \delta)$ has a unique subgame perfect equilibrium for any T and any discount factor δ. What are the payoffs?

b) Show that for high enough δ there is a SPE σ of the infinitely repeated game $G(\infty, \delta)$ for which $u_1(\sigma) = u_2(\sigma) = -1$. HINT: Use Additional Exercise 1.