Game Theory with Applications

Homework #5 – Due Thursday, December 22

Two players are playing an infinitely-repeated prisoner's dilemma game of the following form

		Player 2	
		C	D
Player 1	C	(2, 2)	(0, 3)
	D	(3, 0)	(1, 1)

The players simultaneously choose action at regular intervals.

Consider the following "grim trigger strategy" in which player $i, i = 1,2$ chooses C in the first stage. In the t^{th} stage, if the outcome of all t-1 preceding stages has been (C, C) then player i chooses C; otherwise, player i chooses D.

1. Explain how you show that the "grim trigger strategy" is a Nash equilibrium strategy of the infinitely repeated game of this game.

2. Suppose Player 1 adopts the grim trigger strategy,

   (a) what is Player 2's best response in stage t if the outcomes of stage 1, .., t-1 are other than (C, C)?

   (b) what is player 2's best response in stage t if the outcomes of stage 1,..., t-1 are (C,C)

3. Find the condition on the discount factor δ under which the strategy pair in which each player uses this strategy is a Nash equilibrium of the infinitely repeated game of the Prisoner's Dilemma in the above table.