Assignment 4

Due Date April 8th 2:20pm

Q1: Find the discount factor that sustains the tit-for tat strategy we discussed in class a subgame perfect Nash equilibrium.

Q2: Exercise 276.1 Show there is no pure strategy Nash equilibrium of this game in which player 1 chooses S. Find the mixed strategy Nash equilibrium of the game.

Q3: Exercise 282.1 Two people are involved in a dispute. Person one does not know whether person 2 is strong or weak; she assigns probability α to person 2's being strong. Person 2 is fully informed. Each person can either fight or yield. Each person's preferences are represented by the expected value of a Bernoulli payoff function that assigns the payoff of 0 if she yields (regardless of the other player's action) and a payoff of 1 if she fights and her opponent yields; if both people fight, then their payoffs are (-1, 1) if person 2 is strong and (1,-1) if person 2 is weak. Formulate this situation as a Bayesian game and find its Nash equilibria if $\alpha<1/2$ and if $\alpha>1/2$.

Q4: Exercise 287.1 Consider the game when the inverse demand function is given by $P(Q) = \alpha - Q$ for $Q \leq \alpha$ and $P(Q) = 0$ for $Q > \alpha$. For values of C_H and C_L close enough that there is a Nash equilibrium in which all outputs are positive, find this equilibrium. Compare this equilibrium with the Nash equilibrium of the game in which firm 1 knows that firm 2's unit cost is C_L, and with the Nash equilibrium of the game in which firm 1 knows that firm 2's unit cost is C_H.