Economics 2030

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Questions for Tutorial 6

1. In this question you can appeal to the result that a strategy pair is a subgame perfect equilibrium of a δ-discounted infinitely repeated game if and only if it satisfies the one-deviation property.

   (a) Let G be the following strategic game.

	X	Y
X	$3,3$	$0,4$
Y	$4,0$	$1,1$

   Fix a positive integer T. Is the path in which the outcome is (X,X) in every period from 1 to T and (Y,Y) in every subsequent period a subgame perfect equilibrium outcome of the δ-discounted infinitely repeated game of G when δ is close to 1?

   (b) For the game G in the previous part, determine the range of values of δ, if any, for which the strategy pair in which each player uses the following strategy is a subgame perfect equilibrium of the δ-discounted infinitely repeated game of G:

   - in every odd period, choose X after any history in which in every previous odd period the outcome was (X,X) and in every previous even period the outcome was (Y,Y)
   - in every even period, choose Y after any history in which in every previous odd period the outcome was (X,X) and in every previous even period the outcome was (Y,Y)
   - after any history in which the outcome was not (X,X) in every odd period and (Y,Y) in every even period, choose Y.

   (In particular, each player chooses X in period 1.)

2. Formulate the following parlor game as an extensive game with imperfect information. First player 1 receives a card that is either H or L with equal probabilities. Player 2 does not see the card. Player 1 may announce that her card is L, in which case she must pay \$1 to player 2,

or may claim that her card is H, in which case player 2 may choose to concede or to insist on seeing player 1's card. If player 2 concedes then he must pay \$1 to player 1. If he insists on seeing player 1's card then player 1 must pay him \$4 if her card is L and he must pay her \$4 if her card is H. Find the Nash equilibria of this game.

3. Consider the extensive game in Figure 1.

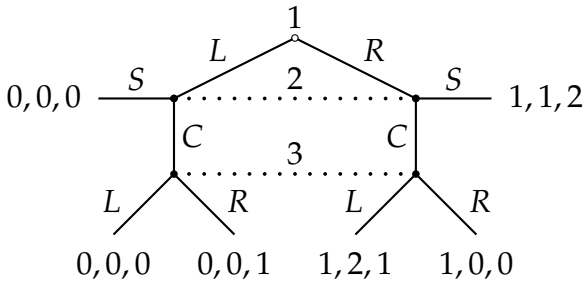

Figure 1. The extensive game for Problem 3.

(a) Find all the pure strategy weak sequential equilibria of this game.

(b) For each pure strategy weak sequential equilibrium, determine if the equilibrium is a sequential equilibrium.