Microeconomics 3: Game Theory
Spring 2021

Problem Set 3

1. Consider the infinitely repeated version of the following game with perfect monitoring

	L	R
T	$5, 0$	$0, 1$
M	$3, 0$	$3, 3$
B	$0, -1$	$0, -1$

Figure 1: Game for question 1

(a) Describe the set of feasible, individually rational payoffs.

(Note that, unlike in the prisoner's dilemma, repeated play of the static nash gives player 2 their highest possible payoff. So Nash reversion is not going to be an effective tool to punish deviations by player 2.)

(b) Describe the strategy profile that corresponds to the following automaton

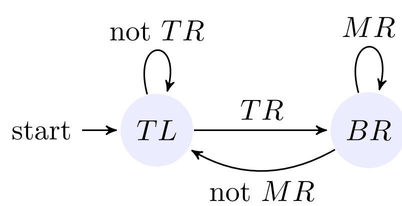

Figure 2: Automaton for question 1b.

(c) What are the payoffs in each state (i.e. $V_i(TL)$, $V_i(BR)$)?

(d) Does this describe a SPE for any $\delta < 1$?

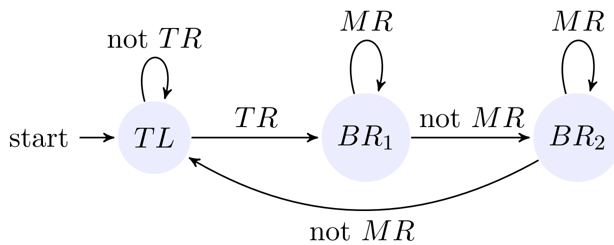

Figure 3: Automaton for question 1e.

(e) Does the following automaton describe an SPE profile for large enough δ?

2. Consider the infinitely repeated version of the following game with perfect monitoring:

	L	R
T	$2, 4$	$0, 3$
B	$4, -1$	$1, 0$

Figure 4: Game for Question 2

(a) Suppose player 1 and 2 are long lived. Describe the feasible set. Construct a strategy profile such that that for high δ there exists a pure strategy subgame perfect equilibrium where player 1 receives a payoff of 3 as $\delta \to 1$.

(b) Suppose instead player 1 is playing against a sequence of short lived players, show that player 1 can never receive a payoff of more than 2 in any pure strategy subgame perfect equilibrium.

3. Consider the alternating offer bargaining game. Construct a Nash equilibrium where player 2 receives a payoff of 0 and player 1 receives a payoff of 1 and verify that the equilibrium you've constructed is not subgame perfect.