Game Theory, Fall 2024
Problem Set 6

Due on Nov 18

1. ST 10.2.

2. ST 10.3.

3. Consider the infinitely repeated prisoners' dilemma with discounting factor $\delta \in (0,1)$. The stage game is in Figure 1. They play EE in the first period. At any history

	E	S
E	$2,2$	$-1,3$
S	$3,-1$	$0,0$

Figure 1: The prisoners' dilemma

   $h = (a^1, \ldots, a^{t-1})$, if they have played EE for all but at most one period, they continue to play EE; otherwise, they play SS. Write down this strategy profile formally and check whether it is a subgame perfect equilibrium for some $\delta \in (0,1)$?

4. Prove that the following strategy profile is a subgame perfect equilibrium when δ is sufficiently large: for $i = 1, 2$,

$$s_i^1 = E, \text{ and } s_i^t(h) = \begin{cases} E, & \text{if } t \text{ is odd and } h = (EE, SS, \ldots, EE, SS) \in H_{t-1}, \\ S, & \text{otherwise.} \end{cases}$$

   In words, they alternate between EE and SS on the equilibrium path. They revert back to the stage Nash permanently after any deviation.

5. ST 10.8

6. ST 10.9

7. ST 11.2

8. ST 11.4