Practice Problem Set 5

Game Theory (C.29)

Question 5.1

Evangeline and Gabriel met at Orientation. They want desperately to meet each other again, but they forgot to exchange names or phone numbers when they met the first time. There are two possible strategies available for each of them. These are *Go to the Big Party* or *Stay Home and Study*. They will surely meet if they both go to the party, and they will surely not otherwise. The payoff to meeting is 1,000 for each of them. The payoff to not meeting is zero for both of them. The payoffs are described by the matrix below.

		Gabriel	
		Go to Party	Stay Home
Evangeline	Go to Party	$1000, 1000$	$0, 0$
	Stay Home	$0, 0$	$0, 0$

(i) Is there an equilibrium with strictly dominant strategies in this game? (Note: A strategy is strictly dominant if, regardless of what any other players do, the strategy earns a player a strictly higher payoff than other strategies.)

(ii) Find all of the pure-strategy Nash equilibria for this game. Do any of the pure Nash equilibria that you found seem more reasonable than others? Why or why not?

Let us change the game a little bit. Evangeline and Gabriel are still desperate to find each other. But now there are two parties that they can go to. There is a little party at which they would be sure to meet if they both went there and a huge party at which they might never see each other. The expected payoff to each of them is 1,000 if they both go to the little party. Since there is only a 50-50 chance that they would find each other at the huge party, the expected payoff to each of them is only 500. If they go to different parties, the payoff to both of them is zero. The payoff matrix for this game is:

		Gabriel	
		Little Party	Big Party
Evangeline	Little Party	$1000, 1000$	$0, 0$
	Big Party	$0, 0$	$500, 500$

(iii) Does this new game have an equilibrium with strictly dominant strategies?

(iv) Find all the Nash equilibria. Is there one equilibrium that is Pareto superior to others? Does the concept of Nash equilibrium predict that Evangeline and Gabriel will converge to this equilibrium?

Question 5.2

Solve the game represented by the following game tree using backward induction: