

Problem set 6

- 1) Three oligopolists operate in a market with inverse demand function given by $P(Q) = a - Q$ where $Q = q_1 + q_2 + q_3$ and q_i is the quantity produced by firm i . Each firm has constant marginal cost of production, c , and no fixed cost. The firms choose their quantities as follows: (1) firm 1 chooses $q_1 > 0$; (2) firms 2 and 3 observe q_1 and then simultaneously choose q_2 and q_3 . Find the subgame perfect outcome.

- 2) Consider the following normal form game where Player 1 chooses the row (either T or B), Player 2 chooses the column (either r or l), Player 3 chooses the table (either R or L)

		Player 3			
		L		R	
		Player 2		Player 2	
Player 1		l	r	l	r
	T	1, 1, 1	0, 0, 0	0, 0, 0	0, 0, 0
	B	0, 0, 0	0, 0, 0	0, 0, 0	4, 4, 4

and assume that player 1 moves first, then player 2 and finally player 3;

- player2, before to play, observes the choice of player 1. Player 3 observes only the choice of player 1, not the choice of player 2.
 - Represent the game using the extensive form
 - Find all subgame perfect Nash equilibria
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- 3) Read paragraph 2.2D of the textbook (Gibbons, pag 79). Find the solution using the following parameters: $g(e) = \frac{e^2}{10}$, $\sigma = 1$, $U_A = \sqrt{\pi}$. (Backward induction outcome and subgame perfect Nash equilibrium)