Exercise Sheet 1

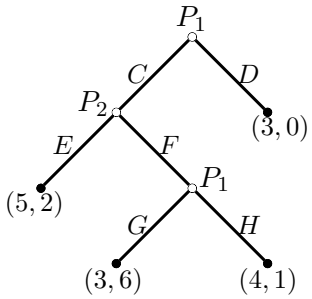
		$P2$		
		L	C	R
$P1$	T	$1, 2$	$3, 4$	$5, 6$
	M	$7, 8$	$9, 0$	$9, 8$
	B	$7, 6$	$5, 4$	$3, 2$

1. Based on the above payoff matrix, answer the following questions:
   (a) Determine dominant, dominating and dominated strategies of the players.
   (b) Determine the best-response functions of the players.
   (c) Determine (possible) Nash equilibria in the game. Are those strict?
   (d) Determine all Pareto-optimal strategy profiles.

2. Generate a payoff matrix, which is structurally equivalent to the prisoners dilemma game, using only numbers from the set $\{-5, -3, 1, 4\}$ for the payoffs.

3. Market demand for a good is given by $Q = 200 - 2P$. The supply side consists of two suppliers, which can prevent other firms from entering the market. The cost functions of the two suppliers are as follows:
   $C_1(Q_1) = 150 + 30Q_1$
   $C_2(Q_2) = 300 + 20Q_2$
   (a) In a Cournot model, what are the reaction functions? Draw them in a picture.
   (b) Determine the Nash equilibrium. What are the equilibrium profits of the firms?
   (c) If the firms cooperate, what are their profits, what is price and how much will be produced?
   (d) Is there an incentive for the firms to stick to the agreement? Give reasons for your answer by using a payoff matrix.
   (e) Now assume a Stackelberg model, in which firm 1 determines quantity before firm 2. Calculate the produced quantities, the price, and the profits?
   (f) Assume that the suppliers produce a homogeneous good. Analyse the situation using a Bertrand model. What do the best-response functions look like?

4. Assume the following game tree:



   (a) State all the relevant components of this game in extensive form.

   (b) How many subgames do you find?

   (c) Determine the Nash equilibria of this game.

   (d) Are those Nash equilibria subgame perfect? If so, why? If not, why not?

5. Assume that an established firm (I) in a market is confronted with a pontential challenger (C). C has the possibility to enter the market ("in") or stay out ("out"). In case C chooses to enter, I has the option to do nothing ("accomodate") or fight the challenger ("fight"). The payoffs of this situation are given in the following payoff matrix:

		I	
		acc	fight
C	in	$5,2$	$-1,0$
	out	$0,3$	$0,3$

   (a) Draw the game tree that represents the above game.

   (b) Determine all Nash equilibria in the game. Are those subgame perfect?

   (c) Is I's threat to fight credible given the above payoff matrix? If so, why? If not, how would you need to change the payoffs to make the threat credible?