

# Problem Set 2: Refresher on Game Theory

Markets, Incentives and Ethical Management

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1. Find all pure strategy Nash-Equilibria of the games *a.)* to *d.)* and the subgame perfect equilibria of *e.)* to *h.)*.

a.)

		Player 2	
		L	R
Player 1	U	2,3	3,2
	D	1,2	2,1

b.)

		Player 2	
		L	R
Player 1	U	3,3	8,2
	D	2,8	6,6

c.)

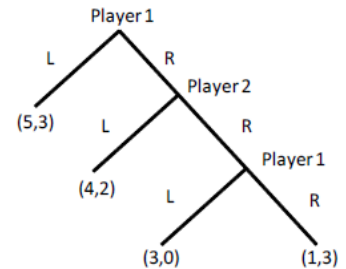
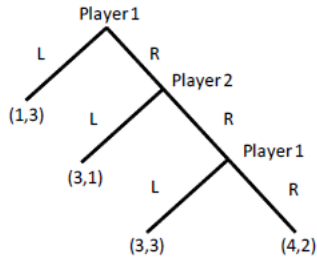
		Player 2	
		L	R
Player 1	U	-1,3	3,2
	D	2,1	2,3

d.)

		Player 2		
		L	M	R
Player 1	U	2,3	1,2	1,2
	M	3,2	2,3	4,1
	D	4,3	1,2	3,1

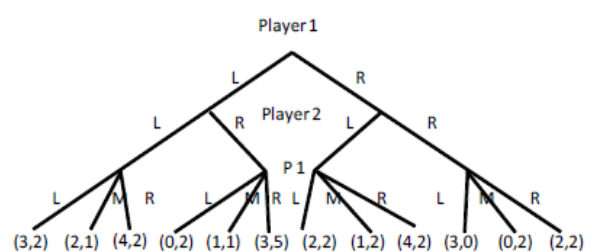
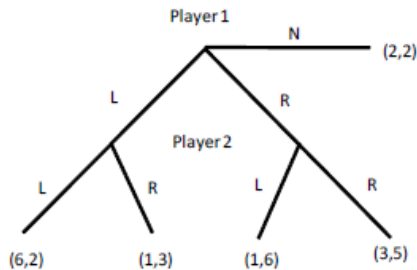
e.)

f.)



g.)

h.)



2. Translate the following situation of strategic interaction into a game by employing a payoff matrix (normal form representation) and determine the the outcome (i.e. the Nash-Equilibrium):

- There are two competing firms (e.g. Audi, BMW) with the same Original equipment manufacturer (OEM) (e.g. Bosch).
- Each firm can undertake a joint quality improvement project with the OEM at a cost of 6 each.
- Both firms will benefit from improved quality of the OEM and get an additional profit of 7.
- Only one of the firms has to make the investment (the other is able to free-ride).
- There will be no additional improvement if both firms invest (still benefit of 7).
- Without the investment the lower quality leads to a loss of 3 for the two firms.