Introduction to Game Theory

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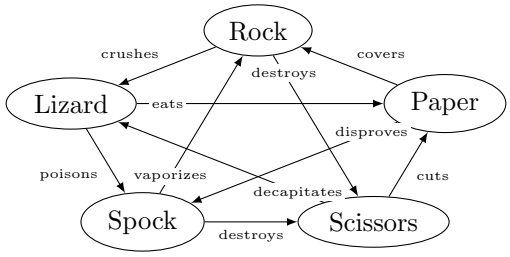
Exercise Sheet 2

Due: Monday, May 8, 2017

Exercise 2.1 (Strategic Games, 4 points)

Formalize the game "Rock, Paper, Scissors, Lizard, Spock"[1] as a strategic game, i.e., specify a set of players, sets of actions for all players, and utility functions in terms of a payoff matrix. The winners of the possible pairings follow from the following graph.



Exercise 2.2 (Elimination of strictly dominated strategies, 3+1 points)

Consider the game $G = \langle N, (A_i)_{i \in N}, (u_i)_{i \in N} \rangle$ with $N = \{1, 2\}$, $A_i = \{a_i, b_i, c_i, d_i\}$, $i = 1, 2$, and the following payoff matrix.

		Player 2			
		a_2	b_2	c_2	d_2
Player 1	a_1	$6, 2$	$2, 7$	$1, 4$	$0, 3$
	b_1	$1, 0$	$3, 2$	$2, 1$	$1, 1$
	c_1	$7, 0$	$2, 2$	$1, 5$	$6, 1$
	d_1	$8, 4$	$1, 2$	$0, 2$	$3, 9$

(a) Iteratively eliminate strictly dominated strategies for as many steps as possible. In each step, specify which strategy of which player was eliminated and by which strategy it was strictly dominated.

(b) Specify the set of Nash equilibria in this game. Which action should player 1 play accordingly?

The exercise sheets may and should be worked on and handed in in groups of two students. Please indicate both names on your solution.

[1] `http://www.slashfilm.com/2008/11/27/votd-rock-paper-scissors-lizard-spock/`