Introduction to Game Theory

B. Nebel, R. Mattmüller, S. Wölfl
T. Schulte, D. Speck
Summer semester 2016

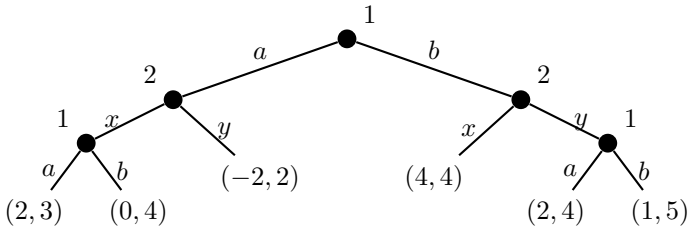
University of Freiburg
Department of Computer Science

Exercise Sheet 6

Due: Thursday, June 16, 2016

Exercise 6.1 (Subgame perfect equilibria, 2 points)

Determine all subgame perfect equilibria of the extensive form game defined by the following game tree.



Exercise 6.2 (Extensive games with simultaneous moves, 3 points)

There is a group of 1000 pirates, who are all extremely greedy, heartless, and rational. Also, every pirate knows that every other pirate has this attitude as well. Their respective position in the group is higher the earlier they joined the group, from pirate 1 down to pirate 1000. The pirates found a treasure and have to decide how to split it among themselves. Every day they vote whether to kill the lowest ranked pirate or to split the treasure among the living pirates. If at least 50% vote for splitting the treasure, they will do so. Otherwise, the lowest ranked pirate is killed and the procedure continues on the next day. When will the treasure be split up and how does the voting proceed?

Exercise 6.3 (Uniqueness of SPE, 2+1 points)

Let Γ be an extensive two-player game with s^* and r^* being subgame perfect equilibria of Γ. Show (for $i \in N$):

(a) If Γ is a ZSG, then $u_i(O(s^*)) = u_i(O(r^*))$.
(b) For general extensive games, $u_i(O(s^*)) = u_i(O(r^*))$ is not necessarily true.

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