

Introduction to Multi-Agent-Programming

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Winter Semester 2008/2009

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Exercise Sheet 7

Due: December 14th, 2009

Exercise 7.1 (Coalition Structure Formation)

Consider the Fire Extinguishing task in the Rescue domain.

- (a) Homogeneous coalitions (0.5pt, written). All fire brigades have the same general capabilities (i.e.: refuel, move, and extinguish). For simplicity and efficiency we will treat the fire brigades as homogeneous agents in coalition structure formation. Show, that this is correct or give a counter example (“a situation”).
- (b) Simple coalition structure formation. (1pt, programming) Write a simple center agent that assigns agents to a coalition. Distribute agents to as many coalitions as possible, but make sure that they have a size of at least 3.

The coalition assignment should be sent to the agents, just use IDList-Token and define a new type “COALITION_ASSIGNMENT” to list the agents in each coalition.

Exercise 7.2 (Role Assignment (1pt, programming))

Write fire brigade agents that receive “COALITION_ASSIGNMENT”. The first agent in the list will assume the role as “Leader”, all others are “followers”. Upon receipt of a “COALITION_ASSIGNMENTS” agents should automatically identify their role and the coalition they are in and act accordingly.

- (a) The leader should choose a viable house to extinguish. Only choose border houses (i.e., burning houses, that have a nearby house that is not burning). Send the id of this house to the other agents (use an IdToken).
- (b) A follower should receive houses to extinguish for his coalition and extinguish them.

Exercise 7.3 (Voting (0.5pt, written))

~~There are two alternative drinks for a party, wine or beer. 66 participants voted for the drinks. The results was calculated according to Borda protocol, in which the preferred drink gets 2 points, the other gets 1 point. Consequently, wine gets 94 points; beer gets 104 points. What are the results if the voting is counted by binary and plurality protocols? Why?~~