Introduction to Multi-Agent-Programming

B. Nebel, A. Kleiner
C. Dornhege, D. Zhang
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University of Freiburg
Department of Computer Science

Exercise Sheet 10

Due: January 28th, 2009

Exercise 10.1 (Ambulance-Agents)

(a) **Sequence Assignment for Coalitions (1pt, programming)**

Create a class calculating civilian sequence assignments for a given coalition structure. Implement the simple algorithm proposed for exercise 9.2a (Use the slides as a reference).

(b) **Coalition formation for rescue operations (1pt, programming)**

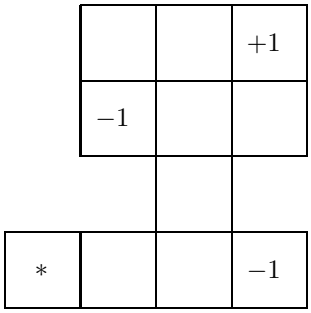
Implement a coalition formation algorithm in the Ambulance Center. Assume, that you can test all coalition structures in time, so no optimizations are needed. Construct and evaluate all coalition structures for a given situation using the SequenceAssignment class. The best coalition should be send to the agents.

To avoid oscillation the coalition formation should only be recalculated in the Center on the following events:

- A new civilian with damage is observed
- A civilian has been rescued
- A civilian that is being rescued dies

Exercise 10.2 (**Q-Learning (1pt, written)**)

Consider the following grid world, where the numbers are rewards associated with the cells. An agent starts at the left-bottom corner. It can perform four possible actions: North, South, East and West. With probability 0.6 the agent reaches the intended state, with probability 0.2 it moves to the right of the intended direction, and 0.2 to left. Compute the optimal policy using Q-Learning.



Please send your solution to dornhege and zhangd @informatik.uni-freiburg.de

*Note: We encourage you to submit the written solution in a **pdf** file. The latex template is available at the exercise web page.*