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 extin-
guish 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?