Carl von Ossietzky Universität Oldenburg

Digitalisierte Energiesysteme

Agent-based Control in Digitalized Energy Systems

Practical Course WiSe 25/26

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Exercise Sheet 2

Exercise 1/2

- Code
- We will provide an exemplary solution

In which data structure do the agents store the neighborhood?

- Most likely a list has been used

Add additional connections to the ring so that you achieve a highly simplified Small World, e.g. with *k* = 2 and no additional connections (random factor would then be 0).

– Part of the exemplary solution for Exercise 1

Do the received_ids data structures and the neighborhood contain the same IDs? In which case is this the case?

- The IDs are the same, but are in different formats.
- This is only the case if Neighborhood is implemented bidirectionally/undirectionally!
- Some of you mentioned
  - data loss/connection loss
  - incorrectly implemented neighborhood generation

Have the topology agent create and distribute another topology…

- vary k and/or add random connections
- (also possible and really nice: Implement a completely different one)
- k = 1: 30
- k = 2: 50
- k = 3: 70
- …

How would we have to change the system shown above so that all agents know the IDs of all other agents in the system?

- The easiest way is to set k=5 or k=4
- add random connections (randomize=1).

Exercise 8

– Code

n-Queens problem (examplary, Reasoning is important again!)

- **fully** / partially observable
- single or **multiagent**
- competetive / **cooperative**
- **deterministic** / stochastic / non-deterministic
- **episodical** / sequential
- **static** / dynamic
- **discrete** / continuous
- **known** / unknown

Concisely describe a possible strategy of the QueenAgent to solve the n-Queens problem.

- Backtracking
- Cooperative bruteforce would also be possible

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Exercise Sheet 3