Linköping University

TDDC17 -Artificial Intelligence

Lab1

Intelligent Agents

Authors:
Janne Väisänen,
javnva415@student.liu.se
Jacob Hagnell
jacha077@student.liu.se

Assistent:
Mariusz Wzorek
mariusz.wzorek@liu.se

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Linköping University
INSTITUTE OF TECHNOLOGY

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1 The ”sucky” algorithm

The task was to clean the square world of unknown size without any obstacles.After cleaning the world from all dirt it was to return to it’s home square and shut down.The agent had no information about where dirt was located within this world in advance. The simplest strategy to achieve the goal was as as follows.

- Find our way to the most northern westerly (upper left) corner of the world.
- Turn so that we face east (or west).
- Start cleaning a row in one direction. When reaching the end of the row we move down one row and continue cleaning in the opposite direction. If, while cleaning,we come across the home square at any time we store it’s coordinates.
- When reaching the southern wall, we know that all rows and squares have been cleaned.So we move to to the home square and shut down.A path to our home square is found by simple a arithmetic calculation i.e current x - home x = number needed to move west or east and similar for north south.

1.1 main decision-”loop”

Internally the agent gets passed a percept given that percept, the previous action and current state the state gets updated and a action is calculated and returned.

1.2 What data did we store?

The code skeleton already included a state object (MyAgentState) consisting of some variables relevant to us for following information we also added a few ones our selves here is an overview some of the variables (both pre-existing and added).

agent_x_position, agent_y_position To keep track of the x-coordinate and y-coordinate of the agent.

agent_last_action Represented what action was taken before we arrived at current state.

world A matrix of the world state used for debugging (could had been used to solve assignment but we choose not to)

facing Represented the direction we where facing.

home_x_coord, home_y_coord Stored the x and y coordinates of the home square.

stage This represented the current mode of the agent. We identified four the four modes init, vacum, vacum_complete, stop. In init-mode the agent would find top left move to the top left corner. While in vacum-mode the agent would clean the world. When finnished cleaning the agent enterd vacum_complete-mode that tock the agent to it's home. Finally in stop-mode the agent shut it self off.

actionQueue Queue of actions that represented moving the agent in some way. The queue allowed us to "queue up" several consecutive moves.

1.3 Motivation for our solution

Initially we thought of using a depth first search algorithm. But given the premises of a world without obstacles and a square world we figured that there is no gain in using such an algorithm (actually probably would preform worse). The algorithm we use is under these circumstances is at least complete and preform better then the two given agents :).