Foundations of Artificial Intelligence

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Exercise Sheet 1
Due: February 26, 2020

Exercise 1.1 (6 marks)

Check the literature and the internet to investigate to which extent the following tasks can nowadays be performed automatically by computers. Describe their performance relative to humans in one sentence, and additionally mention which type of AI system can be used to solve this problem.

(a) Understanding natural language

(b) Solving a Sudoku puzzle

(c) Driving a car

(d) Playing StarCraft II

Exercise 1.2 (3 marks)

Characterize the following definitions of Artificial Intelligence with respect to the four categories (acting humanly, thinking humanly, thinking rationally, acting rationally) that have been introduced in the lecture. Justify your answers.

(a) "The enterprise of constructing a physical symbol system that can reliably pass the Turing Test." (Ginsberg, 1993)

(b) "The field of computer science that studies how machines can be made to act intelligently." (Jackson, 1986)

(c) "The exciting new effort to make computers think . . . machines with minds, in the full and literal sense." (Haugeland, 1985)

Exercise 1.3 (3 marks)

Consider an agent in a 2D grid where certain cells are blocked trying to reach the upper right corner of the grid. The agent can observe whether it is at the goal or not, and whether the cells north, south, east and west are blocked.

(a) Provide a description of a possible implementation for such a reflexive agent.

(b) Is the agent guaranteed to find the goal (if it is reachable) in finitely many steps? Justify your answer.

Important: Solutions should be submitted in groups of two students. However, only one student should upload the solution. Please provide both student names on each file you submit. We can only accept a single PDF or a ZIP file containing *.java or *.pddl files and a single PDF.