

GWV – Grundlagen der Wissensverarbeitung

Tutorial 2: Search Spaces

Class Exercise 2.1: (Peg Solitaire)



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In peg solitaire (depicted above), you need to clear the board (with only one peg left) by repeatedly jumping with one peg over another one, removing the latter from the board. Construct an appropriate search space for the game.

Characterize the search space w.r.t. its properties.

Ca. 30 min.

Class Exercise 2.2: (Disease spreading)

Diseases need some way to spread. In a hospital, there is a disease A spreading. You currently have thirty people showing symptoms. You assume that the disease can spread from one person to another if both are in the same room for some time. The symptoms of A are only visible a day after the person has been infected.

How could you answer these questions using search?

- Some people show symptoms. Who could already be infected?
- Who introduced A to the hospital?
- Is the observation that A has symptoms consistent with the assumed way of infection?

Exercise 2.3: (Search Space Construction 2)

In the game Scotland Yard, Mister X has to evade several detectives using different means of transportation (and spending tickets). Suppose (against the rules of the game) you as Mister X has a fixed amount of steps before the detectives may move a fixed amount of steps (and that is all – nor more steps afterwards!).

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How would you find a place to go where the detectives can't reach you?

Exercise 2.4: (Seach Space Construction 3)

Define the search space, the goal, properties for the search space and an appropriate search strategy for the following problems:

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- Placing furniture in a flat. There are different kinds of furniture you can put in a set of places. Try to find an optimal placement.
- Construction Site planning. When building a house, you can only paint the walls after the walls have been built. How should a house be built? You can abstract away from the time the activities take.
- An elevete has to transport people in a sensible way. Suppose you have an elevator and several people want to use it, standing in different floors. What should the elevator do?

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Achievable score on this sheet: 12