Tutorial 1– Spring 2022

Course Code	*Course*		
CSE 472	**Artificial Intelligence**	**Date:**	**12 / 3 / 2022**
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Sheet 1

1. Given a 5-liter jug filled with water and an empty 2-liter jug. The objective is to obtain precisely 1 liter in the two-liter jug. Water may either be discarded or poured from one jug into another; however, no more than the initial 5 liters is available.

   (a) Formulate the above problem and define all successors of the initial state
   (b) Write down a solution path from the initial state to the goal state.

2. Your goal is to navigate a robot out of a maze. The robot starts in the center of the maze facing north. You can turn the robot to face north, east, south, or west. You can direct the robot to move forward a certain distance, although it will stop before hitting a wall. Formulate this problem.

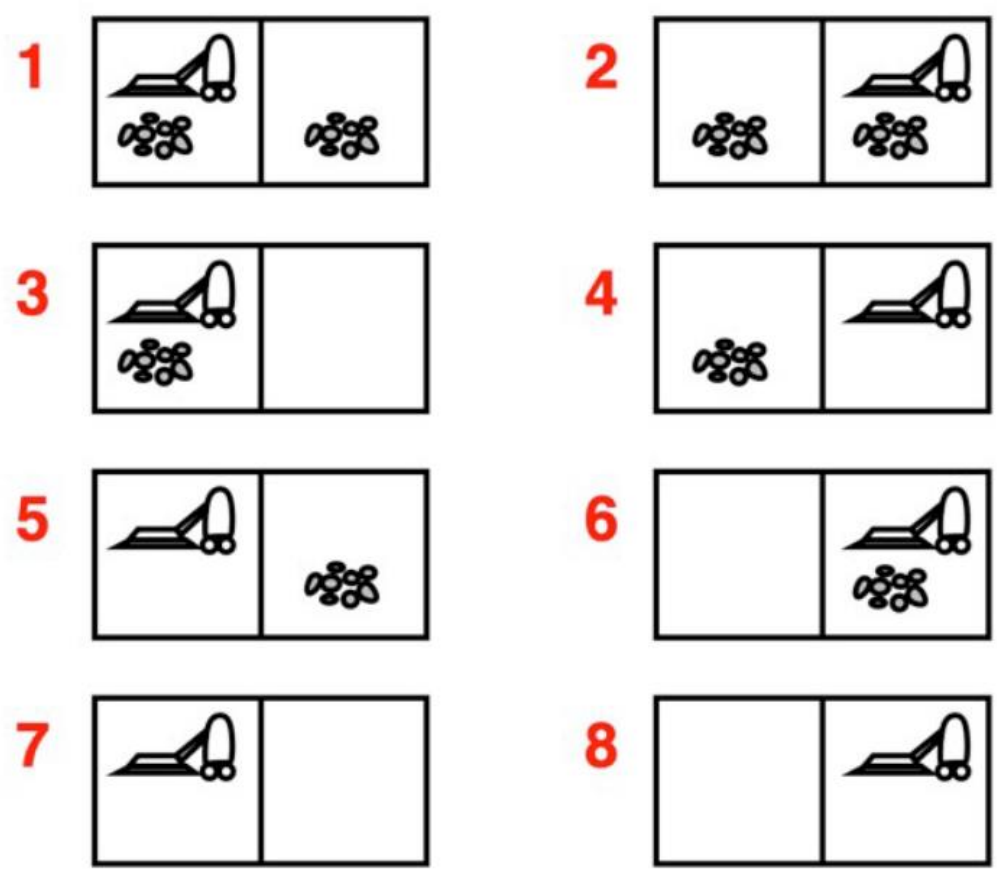
3. **Route-finding problem** is defined in terms of specified locations and transitions along links between them. Formulate this problem

4. Knuth conjectured that, starting with the number 4, a sequence of factorial, square root, and floor operations will reach any desired positive integer. For example, we can reach 5 from 4 as follows:

$$\left\lfloor \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{(4!)!}}}}} \right\rfloor = 5$$

   Formulate this problem.

5. In the following problem, define successors of 1, 4 and 6:



6. In the following problem, define successors of A, B: