



National University of Modern Languages, Islamabad

Faculty of Engineering and Computer Science

Department of Software Engineering

First Assignment

BS SE (5) Evening-SP-2022

Artificial Intelligence

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Assignment Submission Date: 13-03-2023

Points: 10

Instruction:

- Copied from any source leads to zero marks
- A handwritten assignment is required.

QNO1. For each of the following agents,

- Develop a PEAS description of the task environment:
 - Robot soccer player;
 - Internet book-shopping agent;
 - Autonomous Mars rover;
 - Mathematician's theorem-proving assistant
- Write the agent functions/ agent program for each of the case above
- Which agent is better for the above tasks, justify your answer with proper rationales.

QNO2. In Squares World, there are squares and a table big enough to hold all the squares. Each square is on the table or on a single other square. For each square a , either it is clear or it has another unique square b that sits on it. Here we can only pick a single clear square and i) move it from another square onto the table(Figure 1(a)), ii) move it from the table onto another clear square(Figure 1(a)), iii) from a square onto another clear square(Figure 1(b)). In a single move, squares are not allowed to hop over others(Figure 1(c)). In this problem, we assume that there are only three squares with the same size (the edge length is one), A,B and C. Our table is a line and its length is three. Of course, the squares can only stay on the table. Your mission is to use the search methods covered in class and start from the initial state and reach the goal state each described in (Figure 1(d)). When expanding a node in a way results in a cycle, you can ignore that expansion.

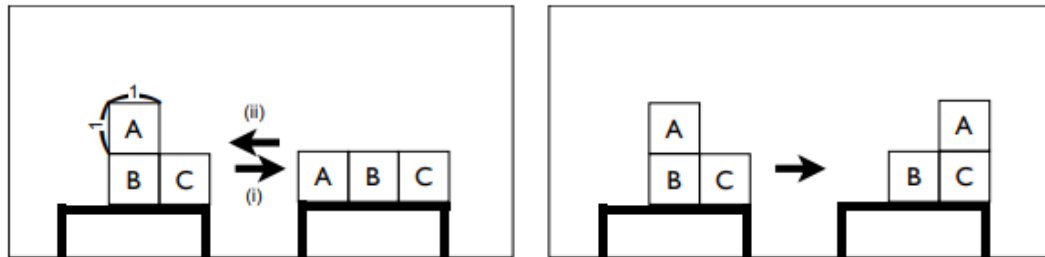
- Show the search tree for depth-first search. Mark the nodes with the orders they are visited.
How many nodes are visited until you reach the goal?
- Show the search tree for breadth-first search. Mark the nodes with the orders they are visited.
How many nodes are visited?
- Which Search Algorithm is best, Justify your answer.



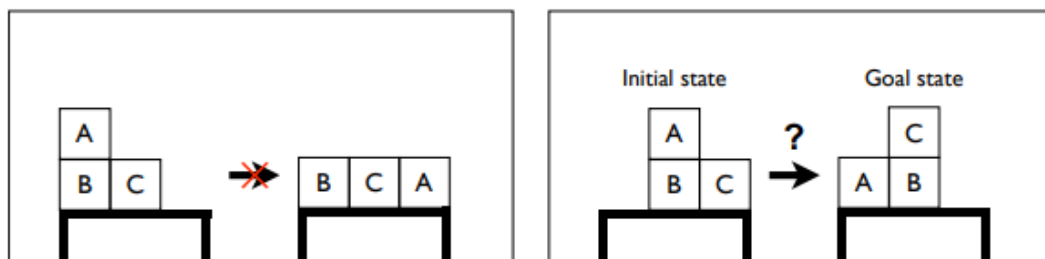
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(a) You can move a single clear square onto the table or vice versa. (b) You can move a single clear square from a square to another clear square.



(c) Squares cannot hop over others in a single move.

(d) Your mission

Figure 1: (a),(b) Possible single moves. (c) Not possible single move. (d) The initial and Goal states for your mission.