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Batch: B3
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29

AI Lab.

Q1)

a) Design an Intelligent system using PEAS

- Medical diagnosis system:

Performance: Healthy patient, Minimize cost, lawsuits

Environment: Staff, hospital, patient

Actuators: Display (questions, tests, treatments)

Sensors: Keyboard, Mouse, Touchscreen.

- Vacuum cleaner Agent:

Performance: ~~Cleanliness efficiency~~ Security, battery life, efficiency, cleanliness.

Environment: Room, table, carpet, floor

Actuators: wheels, brushes of different kind.

sensors: Camera, cliff sensor, bump sensors, dirt detection, sensors, infrared sensors.

b) Problem definition with state space representation.

→ Vaccum cleaner problem

The problem can be formulated as:

States:

The state is determined by both agent location and the dirt locations. The agent is in one of the two locations. each one of which might or might not contain dirt. Thus there are $2 \times 2^2 = 8$ possible states.

Initial state:

Any state can be designated as the initial state.

Actions: There are 3 actions: left, right and suck. Larger environments may have down and up.

Transition model:

The actions have their expected effects, except left in moving the leftmost square, moving right in the rightmost square and sucking in a clean square have no effect.

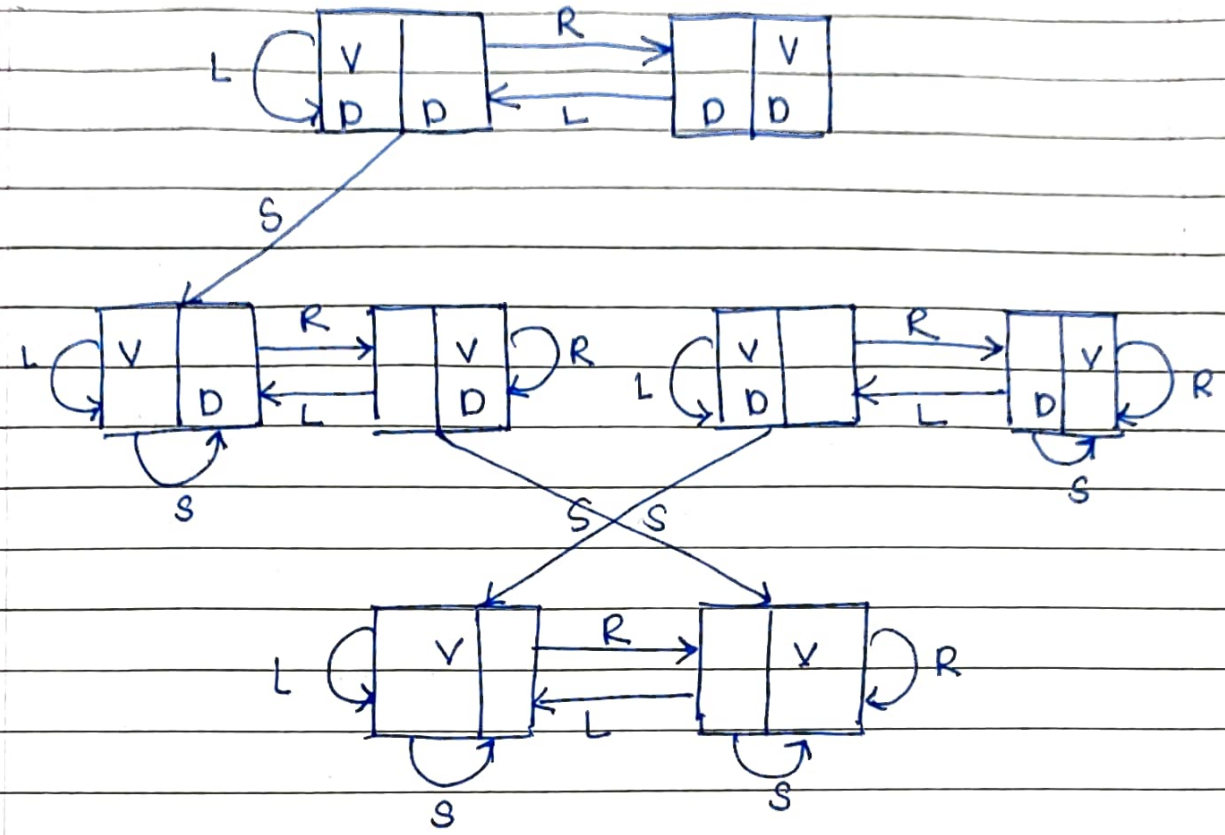
Goal test:

This checks whether all the squares are clean.

Path cost:

Each step costs 1, so path cost is equal to number of steps.

V: Vaccum D: Dirt



8 puzzle problem:

The problem is formulated as a board of 3X3 consists with eight numbered tiles and a blank spaces. A tile adjacent to the blank space can slide into the space. The object is to reach a specified goal state.

7	2	4
5		6
8	3	1

Start state

1	2	4
3	5	6
7	8	

Goal state

States:

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Path cost:

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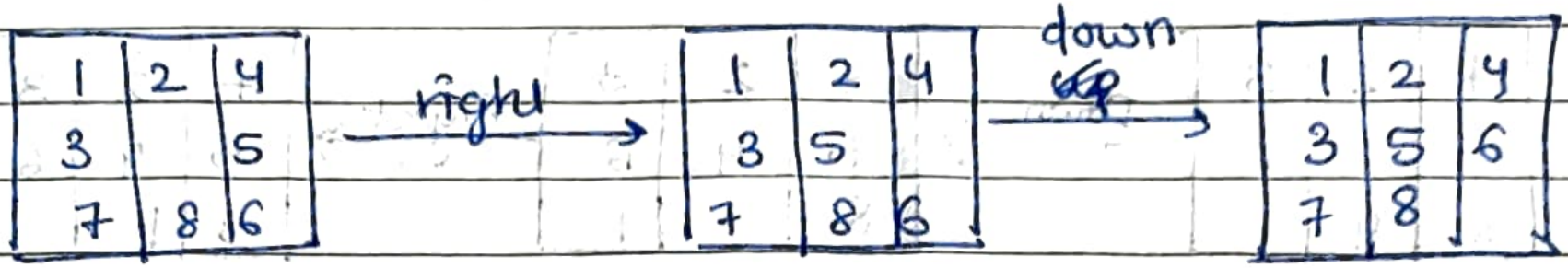
→


Down
Right
up
left
left
up
right
right
down
down
left
up
Right
up
left
down
Right
R.I.P


1 2 4
3 5
7 8 6
right
1 2 4
3 5
7 8 6
down
1 2 4
3 5 6
7 8