

8Puzzle Game

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1 Introduction

A 8puzzle is a form of entertainment that involves solving a visual challenge. It usually consists of a numbers that has been altered or divided into smaller pieces, and the objective is to rearrange those pieces to recreate the original number

2 Problem Formulations

Initial State:

Random arrangement of boxes

Successor function:

Blank move left, right, up, down

Goal test:

Boxes in their places

Path cost:

Each move cost one

3 PEAS:

*** Performance Measure:**

In 8puzzle game, the performance measure could be the time taken to reach the goal (exit) or the number of steps or moves required.

*** Environment:**

the environment includes numbers that are not arranged.

*** Actuators:**

The action in the 8Puzzle game are the actions that the player can take moving the number in different directions (up, down, left, right).

*** Sensors:**

The sensors in the 8Puzzle game Screen.

4 ODESA

*** Observable: Full / Partial**

8Puzzle is fully observable.

*** Deterministic / Stochastic / Strategic**

8Puzzle is deterministic.

*** Episodic / Sequential**

8Puzzle is Sequential.

*** Static/Dynamic / Semi-dynamic**

8Puzzle is Static as the environment remains unchanged.

*** Discrete / Continuous**

8Puzzle is discrete.

*** Agent: Single / Multi**

8Puzzle is single agent.

Ai algorithms that consist: *

Uninformed search and informed

Uninformed search: 1 BFS:

is a simple strategy in which the root node is expanded first, then all the successors of the root node are expanded next, then their successors, and so on. BFS can be implemented by a first-in-first-out

(FIFO) queue, assuring that the nodes that are visited first will be expanded first.

2 DFS: depth-first search explores as far as possible along each branch before backtracking

3 UCS:

a type of uninformed search that performs a search based on the lowest path cost. UCS helps us find the path from the starting node to the goal node with the minimum path cost

informed: 1 A*Tree Search

meaning that it is formulated in terms of weighted graphs: starting from a specific starting node of a graph, it aims to find a path to the given goal node having the smallest cost (least distance travelled, shortest time, etc).

2 Greedy Search:

Greedy best-first search is an informed search algorithm where the evaluation function is strictly equal to heuristic functions, disregarding the edge weights in a weighted graph because only the heuristic value is considered.