Artificial Intelligence & M. Learning

STUDY ASSIGNMENT - (1)

NAME : Miqdad Ali PRN : 1032221413
ROLL NO 18 BRANCH TY CSF

Title : Study state space representation for AI problem solving

Aim : Study State Space representation

Objective : To study state space rep. for AI problem solving.

Theory :

1. State space search :

A problem-solving approach used in Artificial intelligence & Computer science. It involves representing a problem as a collection of states with transitions b/w states representing possible actions.

a. Features of state space search :

Initial state : The starting point.
Goal state : The desired end state.
State Transition : Rules of action that move from one state to another
Path cost : The cost associated with transitioning b/w states.
Search strategy : Method used to explore the state space.

3. Steps in state space search

- Define the initial state : Identify the starting part.
- Specify the goal state : Clearly define the goal or desired outcome
- Generate states : Create new states by applying actions to current state.
- Select the next state : Choose the next state.
- Repeat : Continue generating & selecting states until the goal state is reached or all possibilities are exhausted.

4. State space representation :

State space rep. is the formal way of defining the states, actions & goal of a problem.

- States : A set of all possible configurations of the problem.
- Actions : The set of all possible operations.
- State transition model : A function or set of conditions that determine if its a goal state.

Page No.
Date

Conclusion:

State space rep. is a foundational concept in problem-solving & search algorithm, providing a structured way to model & navigate complex problems.

FAQ's

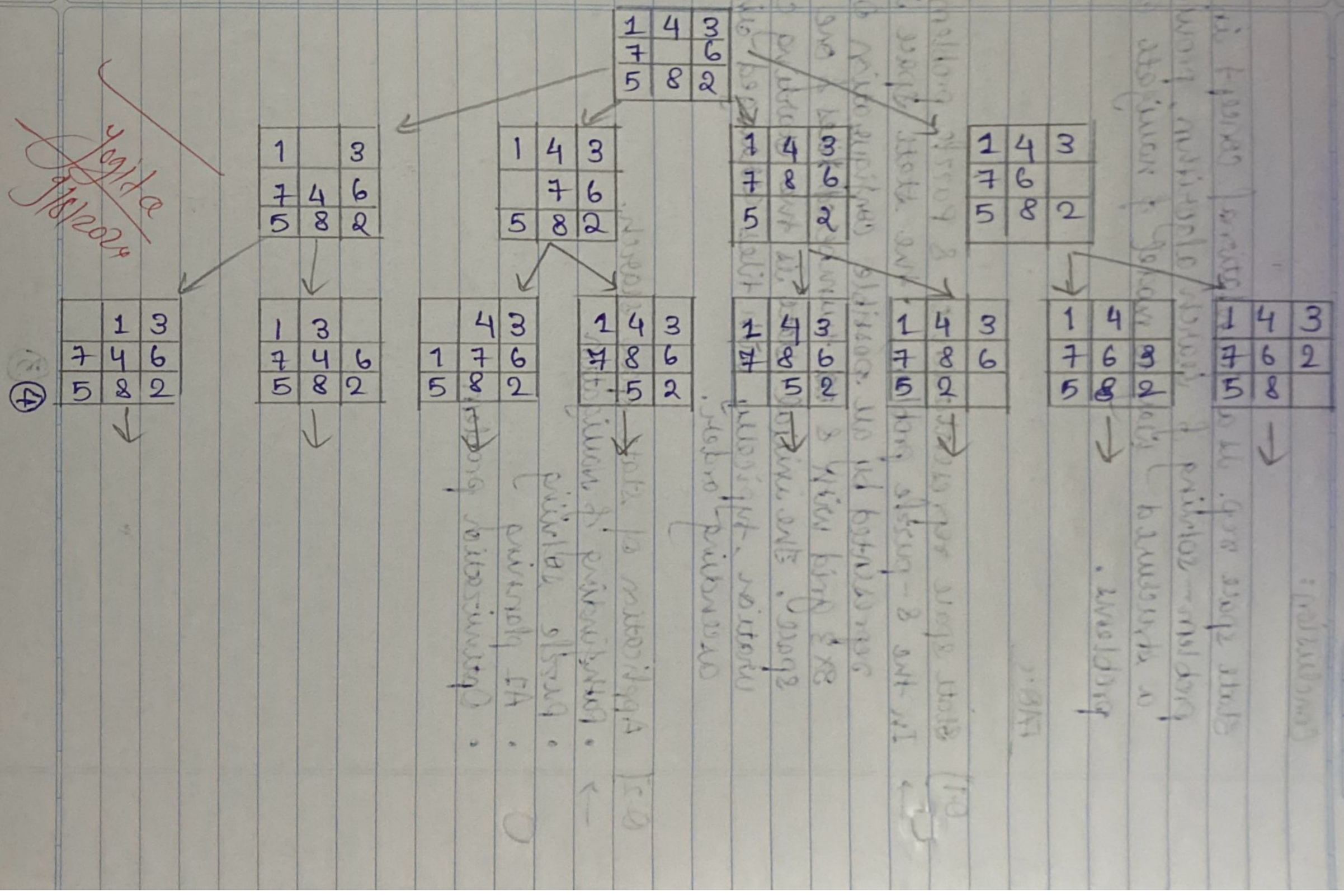
Q.1] State space representation of 8 Puzzle problem.

→ In the 8-puzzle problem, the state space is represented by all possible configuration of the 3x3 grid with 8 numbered tiles & one blank space. The initial state is the starting configuration, typically with tiles arranged in ascending order.

Q.2] Application of state space search.

→
- Pathfinding & Navigation
- Puzzle solving
- AI planning
- Optimization problem

Yogita
5/8/2024



Scanned with CamScanner