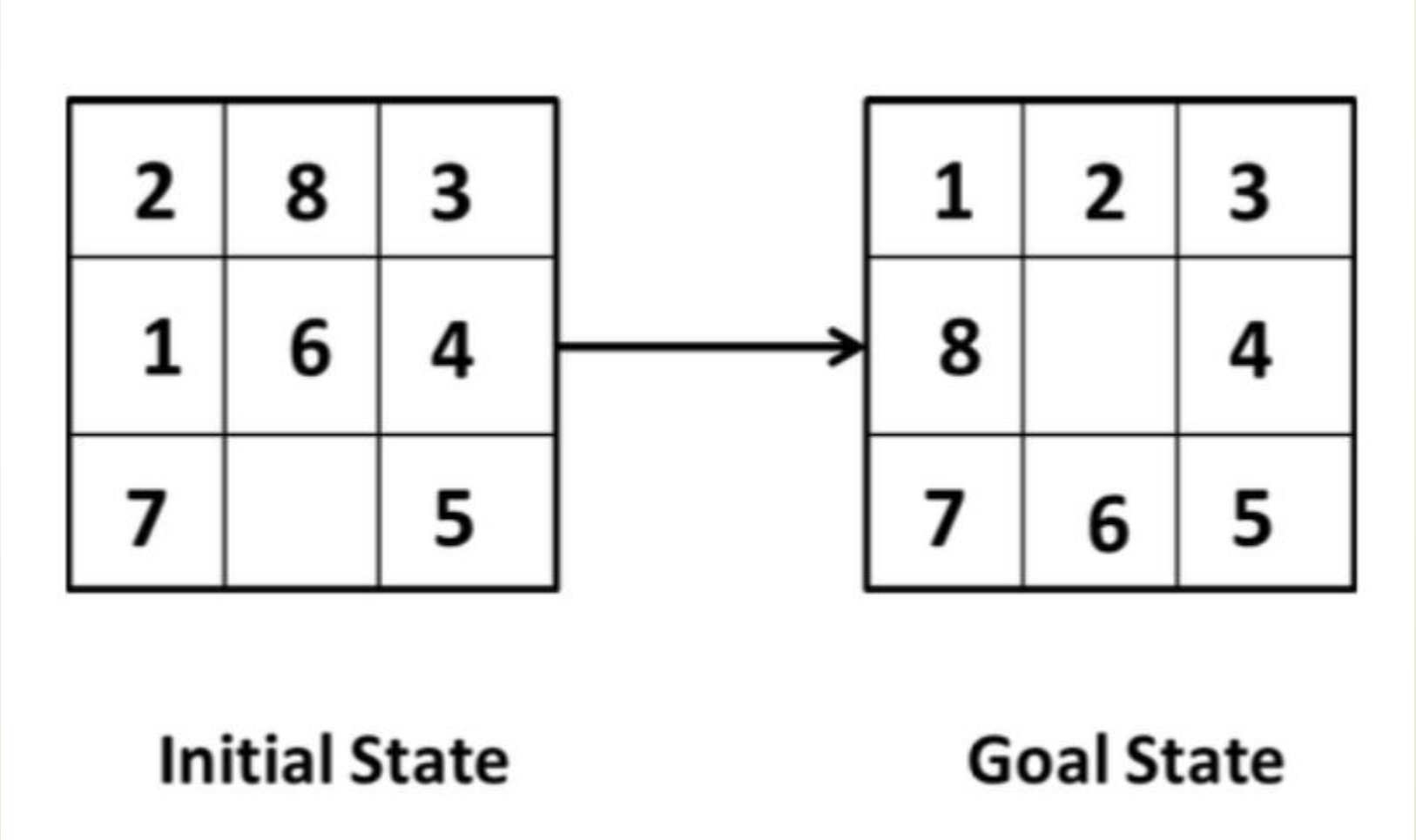
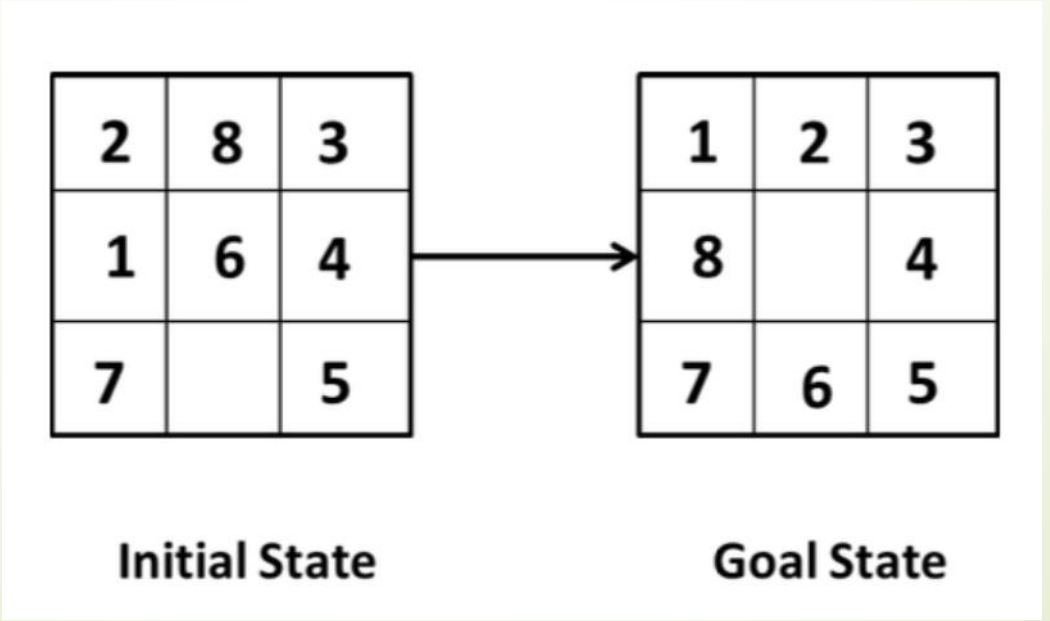
8 puzzle problem

Task:
To reach the goal state starting from the initial state



The 8 puzzle

- States: The different configurations of the tiles.
- Actions: Moving the blank up, down, left, right.
- Initial state: as shown below.
- Desired condition (Goal): be in a state where the tiles are all in the positions as shown below.



The 8 puzzle – questions?

1. How many different states are?

2. Can every action be performed in every state?

3. What is the (general) solution to reach the goal state?

The 8 puzzle – questions?

1. How many different states are?

Answer: The set of all possible configuration in the problem space, consists of 3,62,880 (9!) different configurations of the 8 tiles and blank space.

The 8 puzzle – questions?

2. Can every action be performed in every state?

Answer: No. Only when the blank is in the middle are all four actions possible.

The 8 puzzle – questions?

3. What is the solution to reach the goal state?

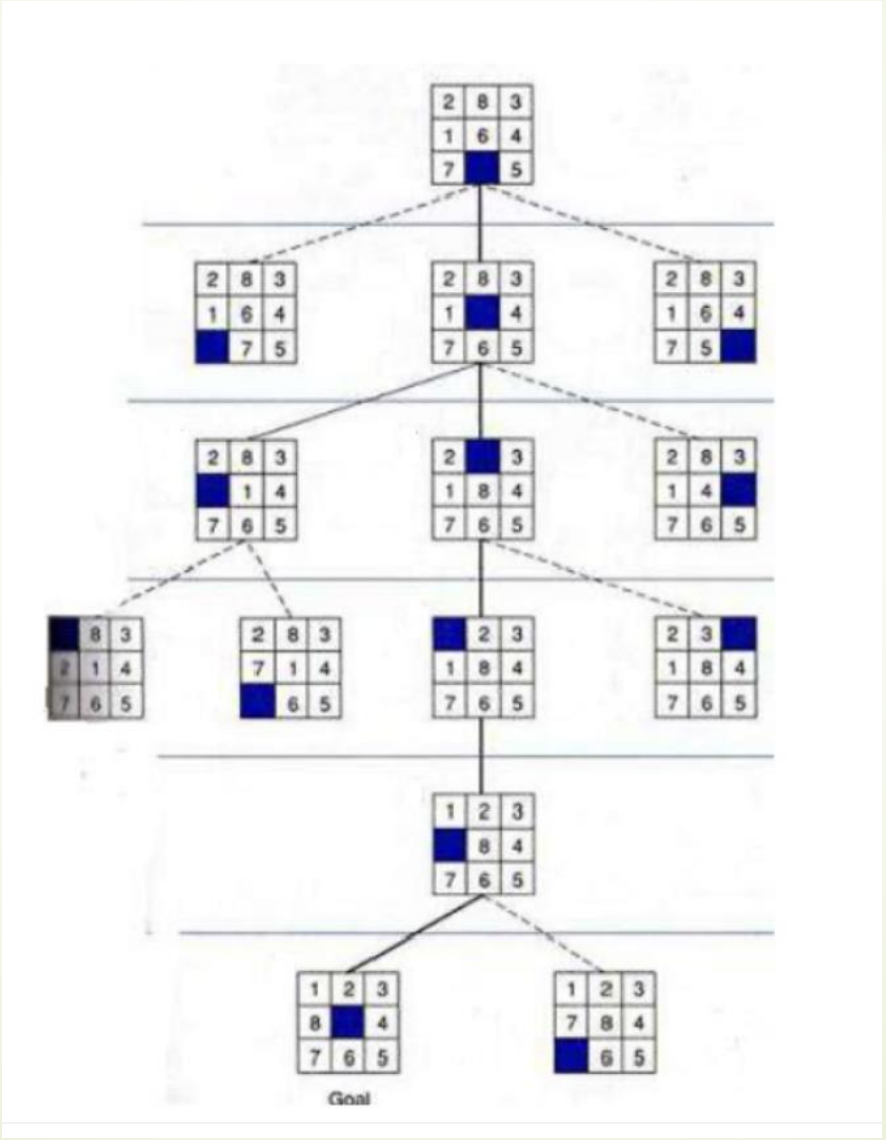
Answer: Solution will be a sequence of moves of the blank that transform the initial state to the goal state.

The 8 puzzle – further questions?

4. How many solutions are (to reach the goal state)?
   Answer: Infinity (trivial).

5. Give a solution to the 8 puzzle problem.

A solution to the 8 puzzle problem



A solution to the 8 puzzle problem