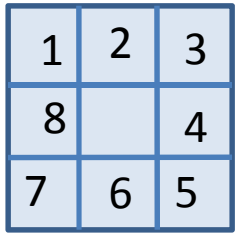


8-puzzle game

Dr. Priyadarshan Dhabe

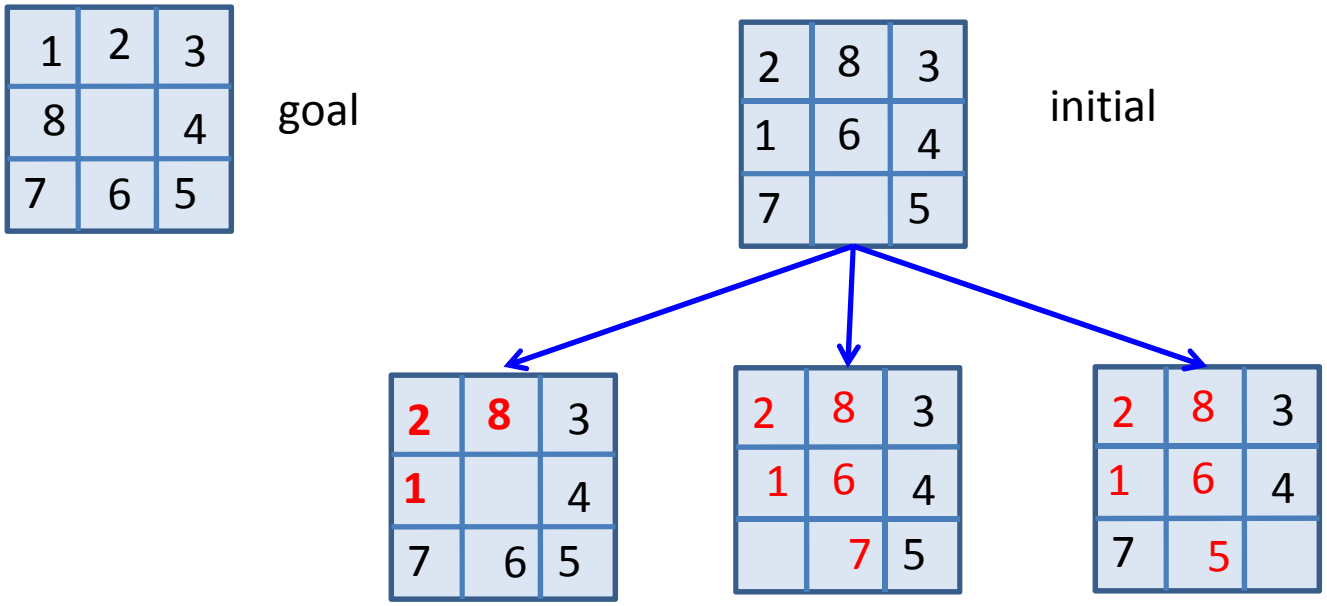
Heuristic functions for 8 puzzle

- **h1(s)**=Number of misplaced tiles w.r.t goal state.
- **h2(s)=** Euclidean distance between current state s and the goal state.

$$x = (x_1, x_2, ..., x_n) \quad \text{and } y = (y_1, y_2, ..., y_n)$$

$$then$$

$$d = \sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2 + ...(x_n - y_n)^2}$$



h1(A)=3 h1(B)=6 h1(C)=6

h1(s)=Number of misplaced tiles w.r.t goal state.

h2(s)= Euclidean distance between current state and goal state

h2(A)= **9.27** h2(B)= 13.11 h2(c)= 12.17

h3(s)=Number of in place tiles w. r. t goal state.

h3(A)= 6 h3(B)= 3 h3(c)=3

Various distances which can be used for 8-puzzle

- Euclidean (L2 Norm) distance
- Manhattan distance
- Mahalanobis distance
- Jaccard distance
- Cosine distance
- Edit distance (https://www.geeksforgeeks.org/edit-distance-dp-5/)
- Hamming distance
- P-Norm distance

Node structure of Linked list for 8-puzzle

Two Linked lists

1. **OPEN**- contains nodes to be processed
2. **CLOSED**- Contains nodes already processed

Cost of getting from Parent node to child node is 1 throughout (uniform cost)