8-Puzzle Problem

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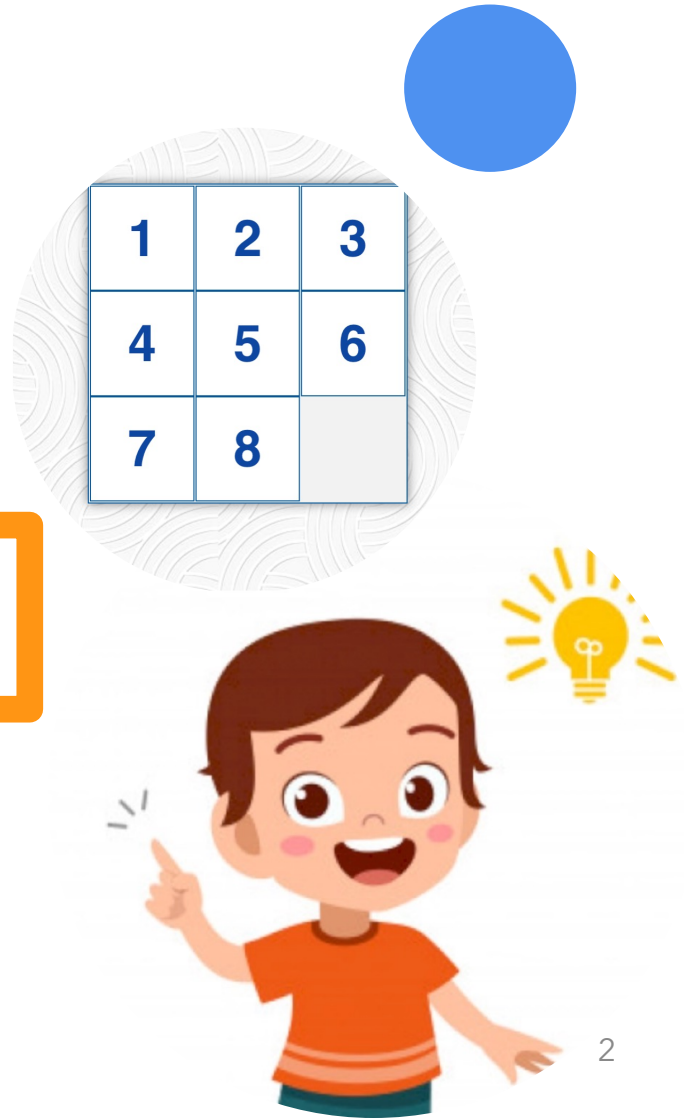
The Algorithm (using A*)

Using heuristic function: f(n)

f(n) = h(n) + g(n)

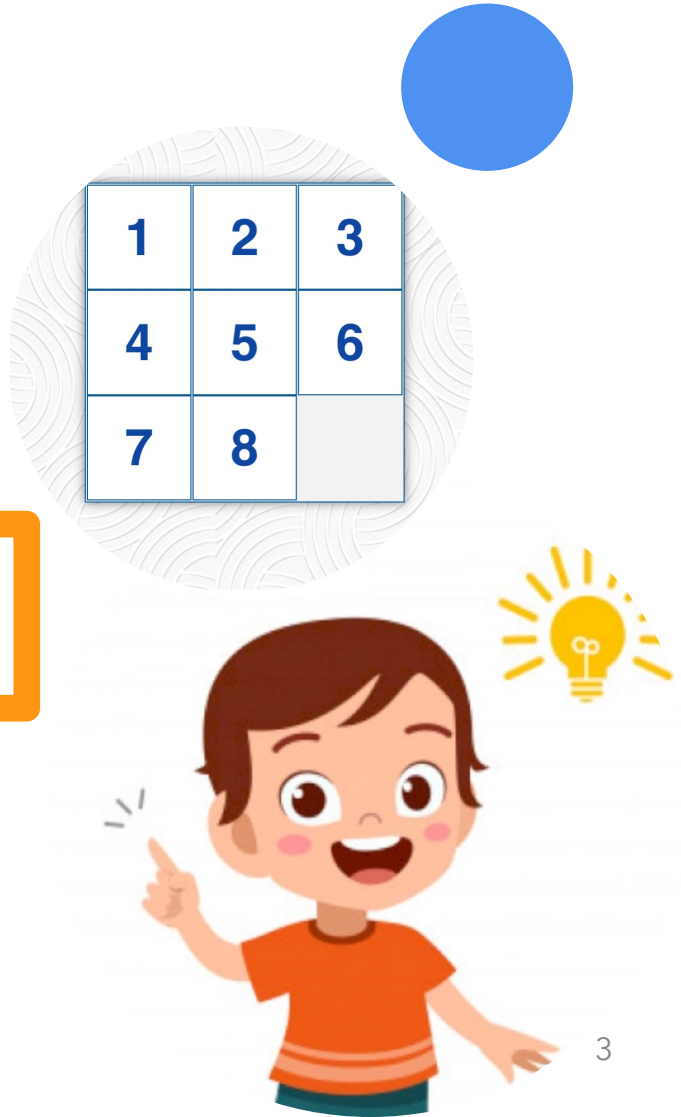
h(n): total of Manhattan distance for every block

g(n): total of empty block movement from start



The A* Sequence

1. If current_matrix == goal_matrix then done
2. Check all possibility moves of empty block
3. Calculate heuristic function for every possibility movement
4. Move the empty block to the lowest value of heuristic function
5. If more than one possibility exists, than choose it randomly



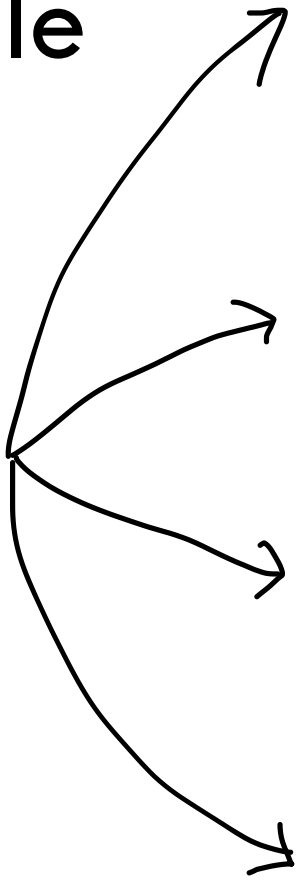
Example

Initial Matrix

1	2	3
4		5
7	8	6

Goal Matrix

1	2	3
4	5	6
7	8	



1		3
4	2	5
7	8	6

h(n) = 3
g(n) = 0
f(n) = 3

1	2	3
	4	5
7	8	6

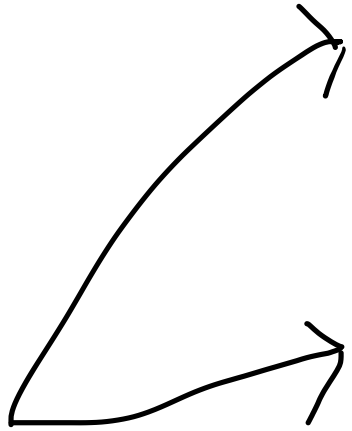
h(n) = 3
g(n) = 0
f(n) = 3

1	2	3
4	8	5
7		6

h(n) = 3
g(n) = 0
f(n) = 3

1	2	3
4	5	
7	8	6

h(n) = 1
g(n) = 0
f(n) = 1



1	2	
4	5	3
7	8	6

h(n) = 2
g(n) = 1
f(n) = 3

1	2	3
4	5	6
7	8	

h(n) = 0
g(n) = 1
f(n) = 1

Documentation

- Source Code: https://github.com/aditsud/8-puzzle-vue
- Demo Application: https://eight-puzzle-solver.web.app /