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1BM22CS335_Yashraj Sinha_8-puzzle_A*

Solving 8-puzzle using A*:
Path length 0: [[1, 2, 3], [4, 0, 5], [6, 7, 8]]
Path length 1: [[1, 2, 3], [4, 5, 0], [6, 7, 8]]
Path length 1: [[1, 0, 3], [4, 2, 5], [6, 7, 8]]
Path length 1: [[1, 2, 3], [0, 4, 5], [6, 7, 8]]
Path length 1: [[1, 2, 3], [4, 7, 5], [6, 0, 8]]
Path length 2: [[1, 2, 0], [4, 5, 3], [6, 7, 8]]
Path length 2: [[1, 2, 3], [4, 5, 8], [6, 7, 0]]
Path length 2: [[1, 2, 3], [4, 7, 5], [0, 6, 8]]
Path length 2: [[1, 2, 3], [4, 7, 5], [6, 8, 0]]
Path length 2: [[1, 2, 3], [6, 4, 5], [0, 7, 8]]
Path length 3: [[1, 2, 3], [6, 4, 5], [7, 0, 8]]
Path length 4: [[1, 2, 3], [6, 4, 5], [7, 8, 0]]
Path length 2: [[0, 1, 3], [4, 2, 5], [6, 7, 8]]
Path length 2: [[0, 2, 3], [1, 4, 5], [6, 7, 8]]
Path length 2: [[1, 3, 0], [4, 2, 5], [6, 7, 8]]
Path length 3: [[1, 0, 2], [4, 5, 3], [6, 7, 8]]
Path length 3: [[1, 2, 3], [0, 7, 5], [4, 6, 8]]
Path length 3: [[1, 2, 3], [4, 5, 8], [6, 0, 7]]
Path length 3: [[1, 2, 3], [4, 7, 0], [6, 8, 5]]
Path length 4: [[1, 2, 3], [4, 5, 8], [0, 6, 7]]
Path length 4: [[1, 2, 3], [6, 0, 5], [7, 4, 8]]
Path length 4: [[1, 2, 3], [7, 0, 5], [4, 6, 8]]
Path length 5: [[1, 2, 3], [0, 6, 5], [7, 4, 8]]
Path length 5: [[1, 2, 3], [6, 4, 0], [7, 8, 5]]
Path length 5: [[1, 2, 3], [6, 5, 0], [7, 4, 8]]
Path length 5: [[1, 2, 3], [7, 5, 0], [4, 6, 8]]
Path length 5: [[1, 2, 3], [7, 6, 5], [4, 0, 8]]
Path length 6: [[1, 2, 3], [7, 6, 5], [4, 8, 0]]
Path length 3: [[1, 3, 5], [4, 2, 0], [6, 7, 8]]
Path length 3: [[2, 0, 3], [1, 4, 5], [6, 7, 8]]
Path length 3: [[4, 1, 3], [0, 2, 5], [6, 7, 8]]
Path length 4: [[0, 1, 2], [4, 5, 3], [6, 7, 8]]
Path length 4: [[0, 2, 3], [1, 7, 5], [4, 6, 8]]
Path length 4: [[1, 2, 0], [4, 7, 3], [6, 8, 5]]
Path length 4: [[1, 2, 3], [4, 0, 7], [6, 8, 5]]
Path length 4: [[1, 2, 3], [4, 0, 8], [6, 5, 7]]
Path length 4: [[1, 5, 2], [4, 0, 3], [6, 7, 8]]
Path length 4: [[4, 1, 3], [6, 2, 5], [0, 7, 8]]
Path length 5: [[1, 0, 3], [6, 2, 5], [7, 4, 8]]
Path length 5: [[1, 0, 3], [7, 2, 5], [4, 6, 8]]
Path length 5: [[1, 2, 3], [0, 5, 8], [4, 6, 7]]
Path length 5: [[1, 2, 3], [4, 8, 0], [6, 5, 7]]
Path length 5: [[4, 1, 3], [6, 2, 5], [7, 0, 8]]
Path length 6: [[0, 2, 3], [1, 6, 5], [7, 4, 8]]
Path length 6: [[1, 2, 0], [6, 4, 3], [7, 8, 5]]
Path length 6: [[1, 2, 0], [6, 5, 3], [7, 4, 8]]
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Path length 7: [[1, 5, 2], [6, 4, 3], [7, 0, 8]]
Path length 7: [[2, 0, 3], [1, 6, 5], [7, 4, 8]]
Path length 7: [[4, 1, 2], [6, 5, 3], [7, 0, 8]]
Path length 7: [[4, 1, 3], [0, 6, 5], [7, 2, 8]]
Path length 7: [[4, 1, 3], [6, 2, 0], [7, 8, 5]]
Path length 7: [[4, 1, 3], [6, 5, 0], [7, 2, 8]]
Path length 8: [[0, 1, 3], [4, 6, 5], [7, 2, 8]]
Path length 8: [[0, 2, 3], [1, 6, 4], [7, 8, 5]]
Path length 8: [[1, 2, 0], [7, 6, 3], [4, 8, 5]]
Path length 8: [[1, 2, 3], [5, 6, 8], [4, 7, 0]]
Path length 8: [[1, 2, 3], [6, 8, 4], [7, 5, 0]]
Path length 8: [[1, 2, 3], [7, 0, 8], [4, 5, 6]]
Path length 8: [[1, 2, 3], [7, 5, 8], [0, 4, 6]]
Path length 8: [[1, 2, 3], [7, 6, 4], [0, 8, 5]]
Path length 8: [[1, 5, 2], [6, 4, 3], [7, 8, 0]]
Path length 8: [[4, 1, 2], [6, 5, 3], [7, 8, 0]]
Path length 9: [[1, 0, 3], [4, 6, 5], [7, 2, 8]]
Path length 9: [[1, 0, 3], [7, 2, 6], [4, 8, 5]]
Path length 9: [[1, 2, 3], [0, 5, 8], [7, 4, 6]]
Path length 9: [[1, 2, 3], [0, 7, 6], [4, 8, 5]]
Path length 9: [[1, 2, 3], [5, 6, 0], [4, 7, 8]]
Path length 9: [[1, 2, 3], [7, 8, 0], [4, 5, 6]]
Path length 9: [[1, 2, 3], [7, 8, 6], [4, 0, 5]]
Path length 10: [[1, 2, 3], [4, 7, 6], [0, 8, 5]]
Path length 10: [[1, 2, 3], [5, 0, 6], [4, 7, 8]]
Path length 10: [[1, 2, 3], [7, 8, 6], [4, 5, 0]]
Path length 11: [[1, 2, 3], [0, 5, 6], [4, 7, 8]]
Path length 12: [[1, 2, 3], [4, 5, 6], [0, 7, 8]]
Path length 13: [[1, 2, 3], [4, 5, 6], [7, 0, 8]]
Path length 14: [[1, 2, 3], [4, 5, 6], [7, 8, 0]]
Solution found using A*!
[[1, 2, 3], [4, 5, 0], [6, 7, 8]]
[[1, 2, 3], [4, 5, 8], [6, 7, 0]]
[[1, 2, 3], [4, 5, 8], [6, 0, 7]]
[[1, 2, 3], [4, 5, 8], [0, 6, 7]]
[[1, 2, 3], [0, 5, 8], [4, 6, 7]]
[[1, 2, 3], [5, 0, 8], [4, 6, 7]]
[[1, 2, 3], [5, 6, 8], [4, 0, 7]]
[[1, 2, 3], [5, 6, 8], [4, 7, 0]]
[[1, 2, 3], [5, 6, 0], [4, 7, 8]]
[[1, 2, 3], [5, 0, 6], [4, 7, 8]]
[[1, 2, 3], [0, 5, 6], [4, 7, 8]]
[[1, 2, 3], [4, 5, 6], [0, 7, 8]]
[[1, 2, 3], [4, 5, 6], [7, 0, 8]]
[[1, 2, 3], [4, 5, 6], [7, 8, 0]]


...Program finished with exit code 0
Press ENTER to exit console.
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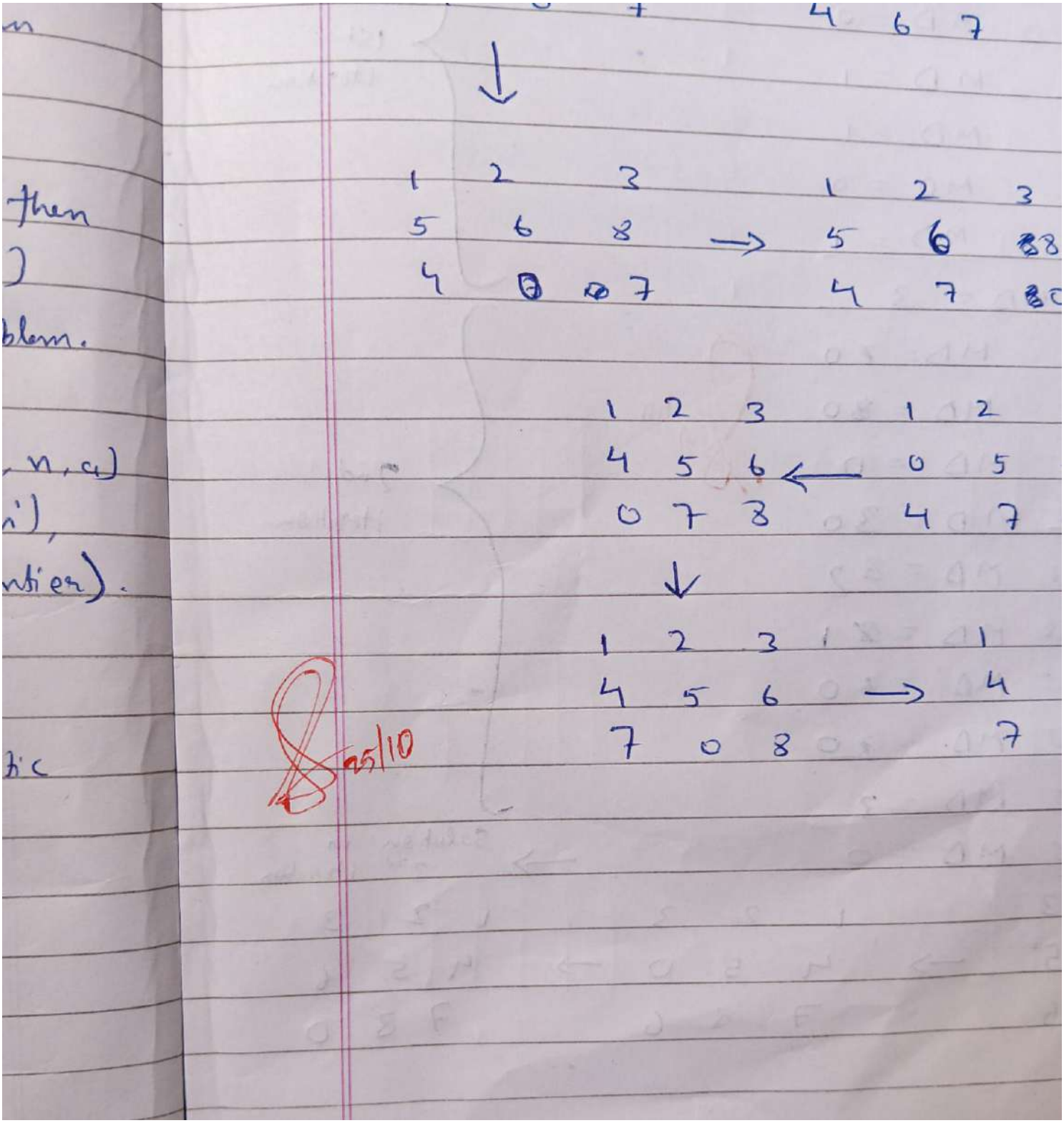

Tile 1 : Manhattan distance (MD) = 0

Tile 3 : MD = 0

Tile 4 : MD = 0

Tile 2 : MD = 1

Tile 7 : MD = 1

Tile 8 : MD = 0

Tile 6 : MD = 1

= Total MD = 3

1 : Total MD = 0

2 : Total MD = 0

3 : Total MD = 0

4 : Total MD = 0

5 : Total MD = 2

6 : Total MD = 1

7 : Total MD = 0

8 : Total MD = 0

= Total MD = 3

) = Total MD = 0

Sol

1	2	3		1	2	3		1
4	0	5	→	4	5	0	→	4
7	8	6		7	8	6		7