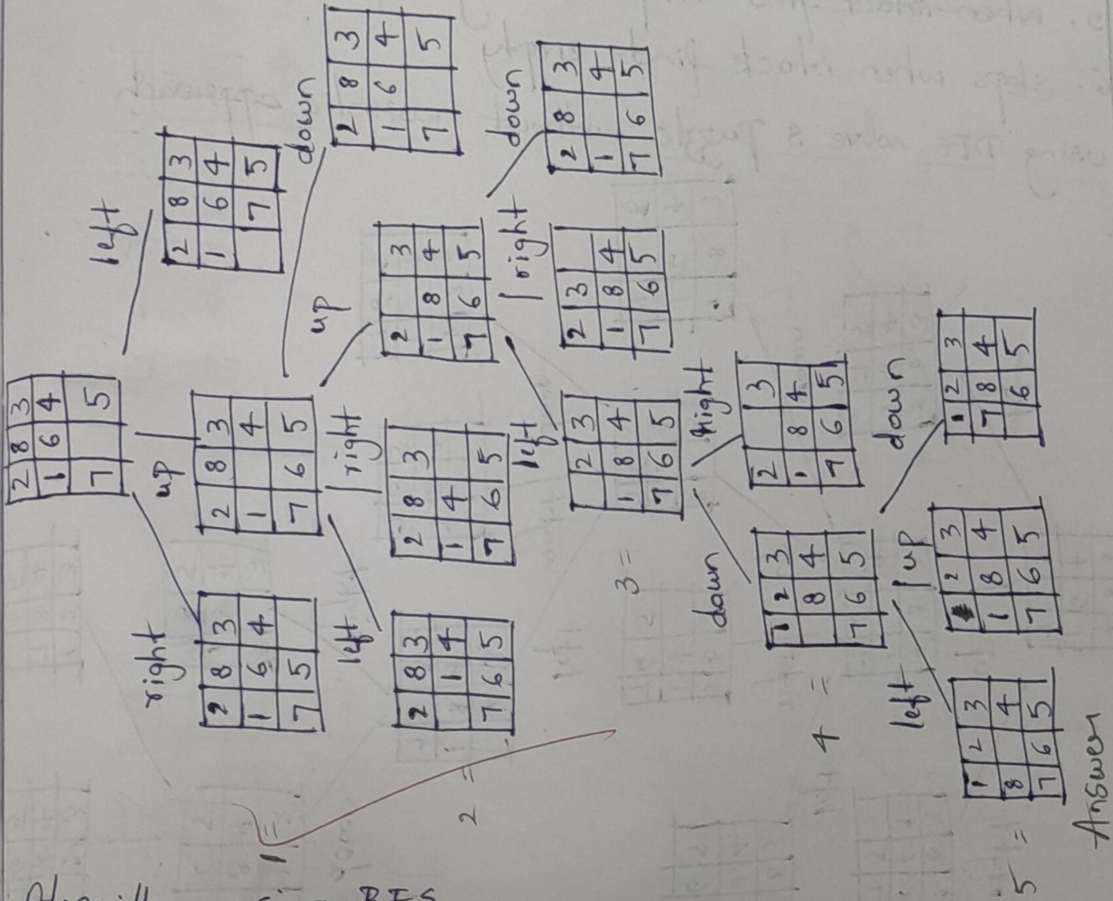
using BFS solve 8 puzzle without heuristic 1/09/25

2	8	3
1	6	4
7		5

initial

1	2	3
8		4
7	6	5

goal



Algorithm using BFS

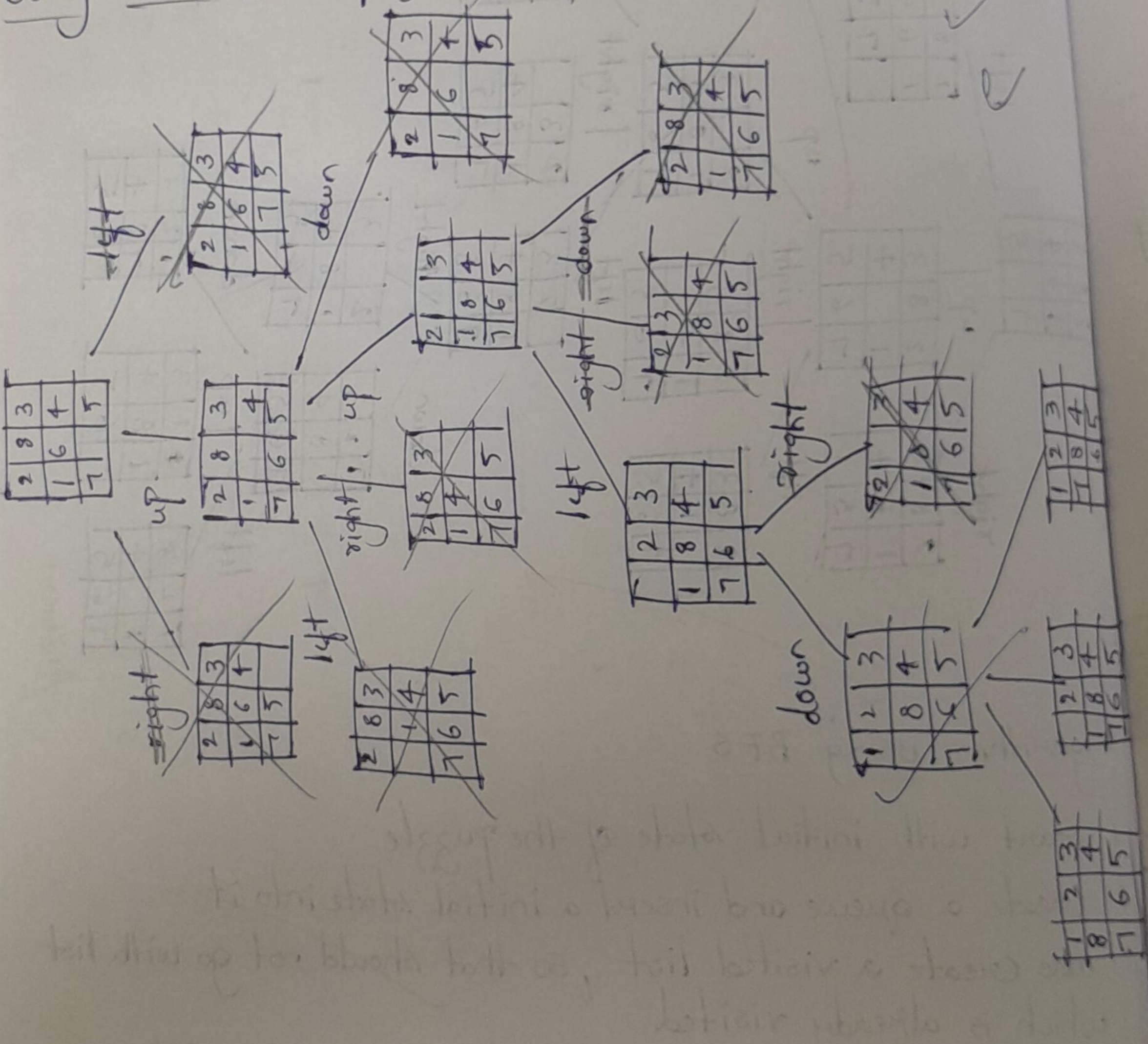
1. start with initial state of the puzzle
2. Create a queue and insert a initial state into it
3. also Create a visited list, so that should not go with list which is already visited
4. to check for the goal move up, down, right and left if

Possible → when Q finds empty, no solution
→ stops when goal is found

Algorithm using DFS

1. start
2. Create a stack and push the initial state
3. Create a visited list to track
4. generate all possible next states by moving the blank title: move up, down, right and left
5. ~~when stack find~~ stops when goal ~~it~~ is found
6. stops when stack finds empty

using DFS solve 8 puzzle without heuristic approach



DFS output
solution found in 5 moves:

2	8	3
1	6	4
7	0	5

= initial

↓

2 8 3
1 0 4
7 6 5

↓

2 0 3
1 8 4
7 6 5

↓

0 2 3
1 8 4
7 6 5

↓

1 2 3
0 8 4
7 6 5

↓

1	2	3
8	0	4
7	6	5

= goal

BFS output
solution found in 5 moves

2	8	3
1	6	4
7	0	5

= initial

↓

2 8 3
1 0 4
7 6 5

↓

2 0 3
1 8 4
7 6 5

↓

0 2 3
1 8 4
7 6 5

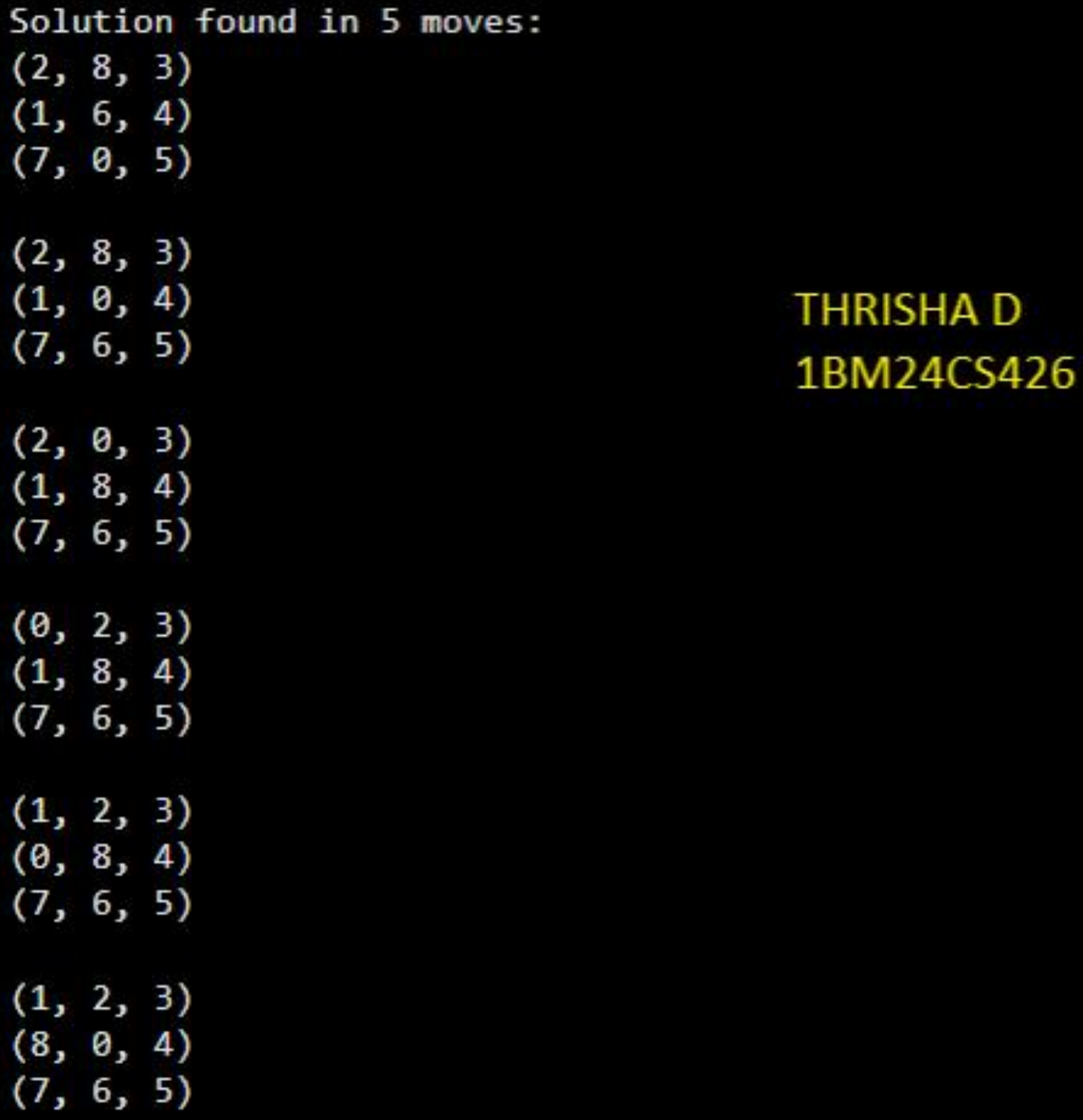
↓

1 2 3
0 8 4
7 6 5

↓

1	2	3
8	0	4
7	6	5

= goal



```
Solution found in 5 moves:
(2, 8, 3)
(1, 6, 4)
(7, 0, 5)

(2, 8, 3)
(1, 0, 4)
(7, 6, 5)

(2, 0, 3)
(1, 8, 4)
(7, 6, 5)

(0, 2, 3)
(1, 8, 4)
(7, 6, 5)

(1, 2, 3)
(0, 8, 4)
(7, 6, 5)

(1, 2, 3)
(8, 0, 4)
(7, 6, 5)
```

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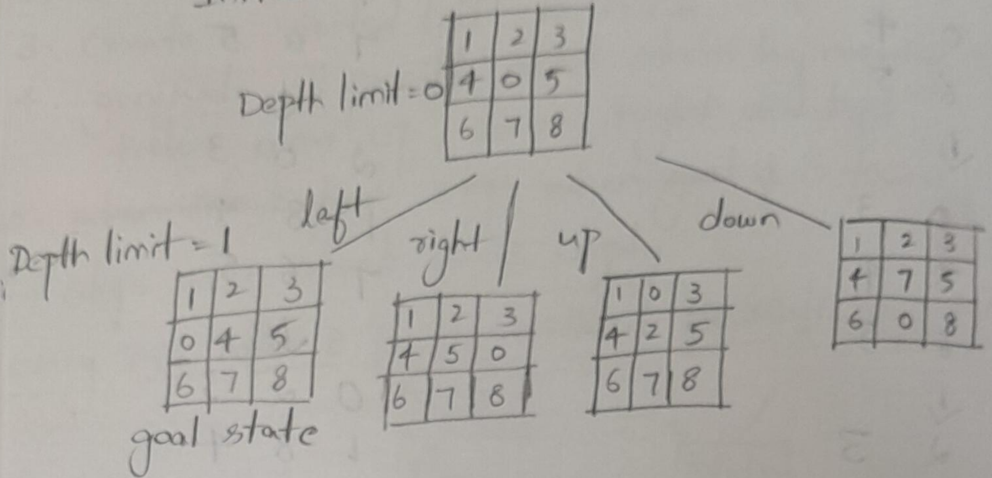
Iterative Deepening search (IDS) or Iterative Deepening Depth first search (IDDFS)

1	2	3
4	0	5
6	7	8

Initial

1	2	3
4	5	0
6	7	8

Goal

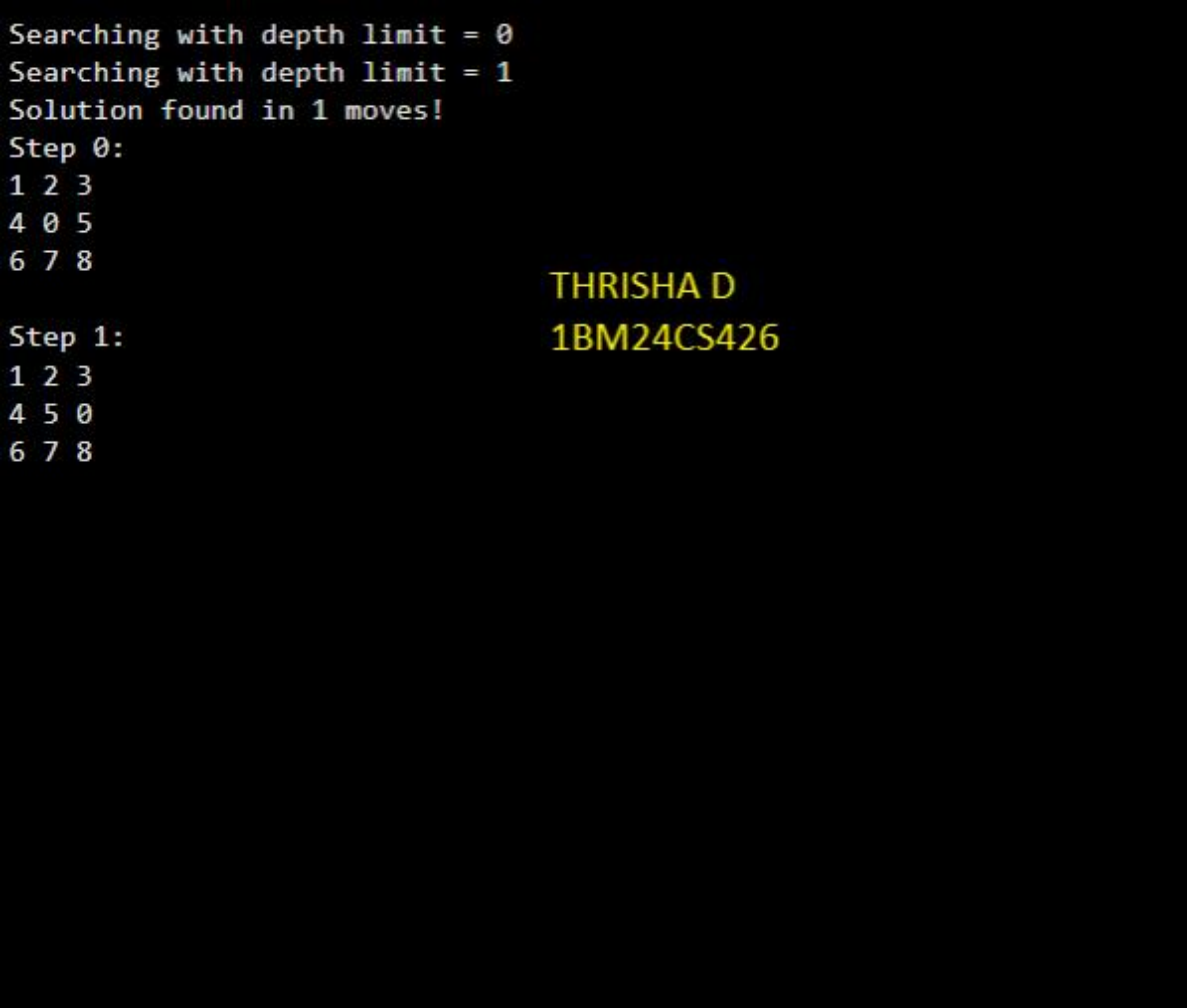


Algorithm

1. Begin by searching for a solution that is 0 moves
2. if not found, search for solutions up to 1 move away
3. if still not found, search up to 2 moves away
4. Keep increasing how deep you search until you find the solution

output:

```
searching with depth limit = 0
searching with depth limit = 1
Solution found in 1 move
step 0 :                  step 1 :
  1   2   3                 1   2   3
  4   0   5                 4   5   0
  6   7   8                 6   7   8
```



```
Searching with depth limit = 0
Searching with depth limit = 1
Solution found in 1 moves!
Step 0:
1 2 3
4 0 5
6 7 8

Step 1:
1 2 3
4 5 0
6 7 8
```

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