

8 Puzzle

Assginment 1

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1 Data Structures

1.1 Breadth First Search

- Queue
- Map

1.2 Depth First Search

- Stack
- Map

1.3 A*Search

- Priority Queue
- Map

2 Sample Runs

2.1 Run 1

1	2	5
3	4	
6	7	8

2.1.1 BFS

- Path Cost: 3
- Nodes Expanded: 5
- Maximum Depth: 3
- Running Time: 0 ms

2.1.2 DFS

- Path Cost: 1061
- Nodes Expanded: 1069
- Maximum Depth: 1062
- Running Time: 10 ms

2.1.3 A* Manhattan Heuristic

- Path Cost: 3
- Nodes Expanded: 4
- Maximum Depth: 3
- Running Time: 1 ms

2.1.4 A* Euclidean Heuristic

- Path Cost: 3
- Nodes Expanded: 4
- Maximum Depth: 3
- Running Time: 0 ms

2.2 Run 2

1	2	3
4	5	6
8	7	

2.2.1 BFS

- Path Cost: 2147483647
- Nodes Expanded: 181441
- Maximum Depth: 32
- Running Time: 737 ms

2.2.2 DFS

- Path Cost: -1
- Nodes Expanded: 255436
- Maximum Depth: 102747
- Running Time: 1008 ms

2.2.3 A* Manhattan Heuristic

- Path Cost: -1
- Nodes Expanded: 202070
- Maximum Depth: 33
- Running Time: 1136 ms

2.2.4 A* Euclidean Heuristic

- Path Cost: -1
- Nodes Expanded: 187622
- Maximum Depth: 32
- Running Time: 1070 ms

2.3 Run 3

8	6	7
2	5	4
3		1

2.3.1 BFS

- Path Cost: 27
- Nodes Expanded: 167762
- Maximum Depth: 27
- Running Time: 663 ms

2.3.2 DFS

- Path Cost: 68301
- Nodes Expanded: 184016
- Maximum Depth: 102714
- Running Time: 892 ms

2.3.3 A* Manhattan Heuristic

- Path Cost: 27
- Nodes Expanded: 6894
- Maximum Depth: 27
- Running Time: 38 ms

2.3.4 A* Euclidean Heuristic

- Path Cost: 27
- Nodes Expanded: 17864
- Maximum Depth: 27
- Running Time: 92 ms