

## Test Cases for Manhattan Distance

### Case 1:

Enter the Start/Initial State for example [1 2 3 4 5 6 7 8 0] :~

1 2 3 7 4 5 6 8 0

Enter the Goal/End State for example [1 2 3 4 5 6 7 8 0] :~

1 2 3 8 6 4 7 5 0

1. Misplaced tiles

2. Manhattan distance

2

1 2 3

7 4 5

6 8 0

1 2 3

7 4 0

6 8 5

1 2 3

7 0 4

6 8 5

1 2 3

7 8 4

6 0 5

1 2 3

7 8 4

0 6 5

1 2 3

0 8 4

7 6 5

1 2 3

8 0 4

7 6 5

1 2 3

8 6 4

7 0 5

1 2 3

8 6 4

7 5 0

Steps taken to reach Goal state: 8

Nodes Visited: 9

Nodes Generated: 19

### Case 2:

Enter the Start/Initial State for example [1 2 3 4 5 6 7 8 0] :~

2 8 1 3 4 6 7 5 0

Enter the Goal/End State for example [1 2 3 4 5 6 7 8 0] :~

3 2 1 8 0 4 7 5 6

1. Misplaced tiles

2. Manhattan distance

2

2 8 1  
3 4 6  
7 5 0

2 8 1  
3 4 0  
7 5 6

2 8 1  
3 0 4  
7 5 6

2 0 1  
3 8 4  
7 5 6

0 2 1  
3 8 4  
7 5 6

3 2 1  
0 8 4  
7 5 6

3 2 1  
8 0 4  
7 5 6

Steps taken to reach Goal state: 6

Nodes Visited: 6

Nodes Generated: 13

### Case 3:

Enter the Start/Initial State for example [1 2 3 4 5 6 7 8 0] :~

7 2 4 5 0 6 8 3 1

Enter the Goal/End State for example [1 2 3 4 5 6 7 8 0] :~

1 2 3 4 5 6 7 8 0

1. Misplaced tiles

2. Manhattan distance

2

7 2 4  
5 0 6  
8 3 1

7 2 4  
5 3 6  
8 0 1

7 2 4  
5 3 6  
8 1 0

7 2 4  
5 3 0  
8 1 6

7 2 4  
5 0 3  
8 1 6

7 2 4  
0 5 3  
8 1 6

0 2 4  
7 5 3  
8 1 6

2 0 4  
7 5 3  
8 1 6

2 4 0  
7 5 3  
8 1 6

2 4 3  
7 5 0  
8 1 6

2 4 3  
7 0 5  
8 1 6

2 4 3  
7 1 5  
8 0 6

2 4 3  
7 1 5  
0 8 6

2 4 3  
0 1 5  
7 8 6

2 4 3  
1 0 5  
7 8 6

2 0 3  
1 4 5  
7 8 6

0 2 3  
1 4 5  
7 8 6

1 2 3  
0 4 5  
7 8 6

1 2 3

4 0 5  
7 8 6

1 2 3  
4 5 0  
7 8 6

1 2 3  
4 5 6  
7 8 0

Steps taken to reach Goal state: 20

Nodes Visited: 282

Nodes Generated: 452

#### Case 4:

Enter the Start/Initial State for example [1 2 3 4 5 6 7 8 0] :~

3 5 1 4 2 6 7 8 0

Enter the Goal/End State for example [1 2 3 4 5 6 7 8 0] :~

1 3 5 4 2 6 7 8 0

1. Misplaced tiles

2. Manhattan distance

2

3 5 1  
4 2 6  
7 8 0

3 5 1  
4 2 0  
7 8 6

3 5 0  
4 2 1  
7 8 6

3 0 5  
4 2 1  
7 8 6

3 2 5  
4 0 1  
7 8 6

3 2 5  
4 1 0  
7 8 6

3 2 5  
4 1 6  
7 8 0

3 2 5  
4 1 6  
7 0 8

3 2 5  
4 1 6

0 7 8

3 2 5  
0 1 6  
4 7 8

3 2 5  
1 0 6  
4 7 8

3 0 5  
1 2 6  
4 7 8

0 3 5  
1 2 6  
4 7 8

1 3 5  
0 2 6  
4 7 8

1 3 5  
4 2 6  
0 7 8

1 3 5  
4 2 6  
7 0 8

1 3 5  
4 2 6  
7 8 0

Steps taken to reach Goal state: 16  
Nodes Visited: 228  
Nodes Generated: 371

### Case 5:

Enter the Start/Initial State for example [1 2 3 4 5 6 7 8 0] :~

1 2 3 7 4 5 6 8 0

Enter the Goal/End State for example [1 2 3 4 5 6 7 8 0] :~

1 2 3 8 6 4 7 5 0

1. Misplaced tiles
  2. Manhattan distance
- 2

1 2 3  
7 4 5  
6 8 0

1 2 3  
7 4 0  
6 8 5

1 2 3  
7 0 4

6 8 5

1 2 3

7 8 4

6 0 5

1 2 3

7 8 4

0 6 5

1 2 3

0 8 4

7 6 5

1 2 3

8 0 4

7 6 5

1 2 3

8 6 4

7 0 5

1 2 3

8 6 4

7 5 0

Steps taken to reach Goal state: 8

Nodes Visited: 9

Nodes Generated: 19

### Case 6:

Enter the Start/Initial State for example [1 2 3 4 5 6 7 8 0] :~

1 3 2 4 5 6 0 8 7

Enter the Goal/End State for example [1 2 3 4 5 6 7 8 0] :~

1 2 3 4 5 6 7 8 0

1. Misplaced tiles

2. Manhattan distance

2

1 3 2

4 5 6

0 8 7

1 3 2

0 5 6

4 8 7

0 3 2

1 5 6

4 8 7

3 0 2

1 5 6

4 8 7

3 5 2

1 0 6

4 8 7

3 5 2  
1 8 6  
4 0 7

3 5 2  
1 8 6  
4 7 0

3 5 2  
1 8 0  
4 7 6

3 5 0  
1 8 2  
4 7 6

3 0 5  
1 8 2  
4 7 6

0 3 5  
1 8 2  
4 7 6

1 3 5  
0 8 2  
4 7 6

1 3 5  
4 8 2  
0 7 6

1 3 5  
4 8 2  
7 0 6

1 3 5  
4 0 2  
7 8 6

1 3 5  
4 2 0  
7 8 6

1 3 0  
4 2 5  
7 8 6

1 0 3  
4 2 5  
7 8 6

1 2 3  
4 0 5  
7 8 6

1 2 3  
4 5 0  
7 8 6

1 2 3  
4 5 6  
7 8 0

Steps taken to reach Goal state: 20

Nodes Visited: 1042

Nodes Generated: 1645