Sample Output:

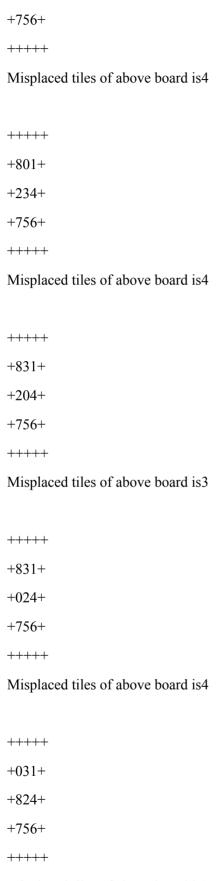**Test Case 1:**

Please enter the initial Board configuration

2 8 1 3 4 6 7 5 0

Please enter the Goal Board configuration

3 2 1 8 0 4 7 5 6

Please enter the heuristic you wish to apply

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

1

Solution for the above configuration

+++++

+281+

+346+

+750+

+++++

manhattan distance of above board is6

+++++

+281+

+340+

+756+

+++++

manhattan distance of above board is5

+++++

+281+

+304+

+756+

+++++

manhattan distance of above board is4

+++++

+201+

+384+

+756+

+++++

manhattan distance of above board is3

+++++

+021+

+384+

+756+

+++++

manhattan distance of above board is2

+++++

+321+

+084+

+756+

+++++

manhattan distance of above board is1

+++++

+321+

+804+

+756+

+++++

manhattan distance of above board is0

Number of steps it took to reach the solution is7

Total number of generated nodes17

Please enter the heuristic you wish to apply

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

2

Solution for the above configuration

+++++

+281+

+346+

+750+

+++++

Misplaced tiles of above board is6

+++++

+281+

+340+

+756+

+++++

Misplaced tiles of above board is5

+++++

+281+

+304+

+756+

+++++

Misplaced tiles of above board is3

+++++

+281+

+034+

+756+

+++++

Misplaced tiles of above board is4

+++++

+081+

+234+

```
+756+

+++++
```

Misplaced tiles of above board is4

```
+++++

+801+

+234+

+756+

+++++
```

Misplaced tiles of above board is4

```
+++++

+831+

+204+

+756+

+++++
```

Misplaced tiles of above board is3

```
+++++

+831+

+024+

+756+

+++++
```

Misplaced tiles of above board is4
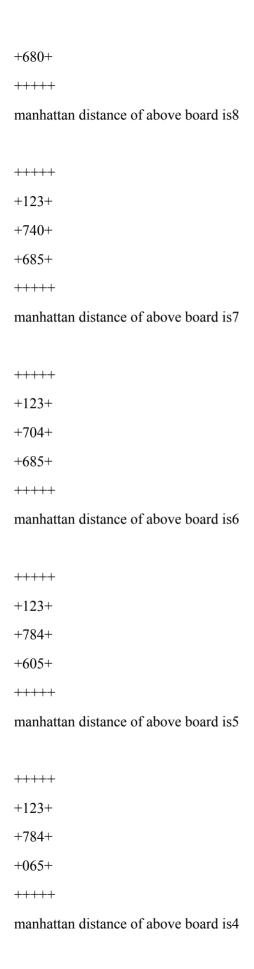
```
+++++

+031+

+824+

+756+

+++++
```

Misplaced tiles of above board is3

+++++

+301+

+824+

+756+

+++++

Misplaced tiles of above board is2

+++++

+321+

+804+

+756+

+++++

Misplaced tiles of above board is0

Number of steps it took to reach the solution is11

Total number of generated nodes29

Test Case 2:

Please enter the initial Board configuration

1 2 3 7 4 5 6 8 0

Please enter the Goal Board configuration

1 2 3 8 6 4 7 5 0

Please enter the heuristic you wish to apply

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

1

Solution for the above configuration

+++++

+123+

+745+

+680+

+++++

manhattan distance of above board is8

```
+++++
+123+
+740+
+685+
+++++
```
manhattan distance of above board is7


```
+++++
+123+
+704+
+685+
+++++
```
manhattan distance of above board is6


```
+++++
+123+
+784+
+605+
+++++
```
manhattan distance of above board is5


```
+++++
+123+
+784+
+065+
+++++
```
manhattan distance of above board is4


```
+++++
+123+
+084+
+765+
```

+++++

manhattan distance of above board is3

+++++

+123+

+804+

+765+

+++++

manhattan distance of above board is2

+++++

+123+

+864+

+705+

+++++

manhattan distance of above board is1

+++++

+123+

+864+

+750+

+++++

manhattan distance of above board is0

Number of steps it took to reach the solution is9

Total number of generated nodes24

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

2

Solution for the above configuration

+++++

+123+

+745+

+680+

+++++

manhattan distance of above board is8

+++++

+123+

+740+

+685+

+++++

manhattan distance of above board is7

+++++

+123+

+704+

+685+

+++++

manhattan distance of above board is6

+++++

+123+

+784+

+605+

+++++

manhattan distance of above board is5

+++++

+123+

+784+

+065+

+++++

manhattan distance of above board is4

+++++

+123+

+084+

+765+

+++++

manhattan distance of above board is3

+++++

+123+

+804+

+765+

+++++

manhattan distance of above board is2

+++++

+123+

+864+

+705+

+++++

manhattan distance of above board is1

+++++

+123+

+864+

+750+

+++++

manhattan distance of above board is0

Number of steps it took to reach the solution is9

Total number of generated nodes 43

Test Case 3:

Please enter the initial Board configuration

0 1 3 4 2 5 7 8 6

Please enter the Goal Board configuration

1 2 3 4 5 6 7 8 0

Please enter the heuristic you wish to apply

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

1

Solution for the above configuration

+++++

+013+

+425+

+786+

+++++

manhattan distance of above board is4

+++++

+103+

+425+

+786+

+++++

manhattan distance of above board is3

+++++

+123+

+405+

+786+

+++++

manhattan distance of above board is2

+++++

+123+

+450+

+786+

+++++

manhattan distance of above board is1

+++++

+123+

+456+

+780+

+++++

manhattan distance of above board is0

Number of steps it took to reach the solution is5

Total number of generated nodes12

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

2

Solution for the above configuration

+++++

+013+

+425+

+786+

+++++

Misplaced tiles of above board is5

+++++

+103+

+425+

+786+

+++++

Misplaced tiles of above board is4

+++++

+123+

+405+

+786+

+++++

Misplaced tiles of above board is3

+++++

+123+

+450+

+786+

+++++

Misplaced tiles of above board is2

+++++

+123+

+456+

+780+

+++++

Misplaced tiles of above board is0

Number of steps it took to reach the solution is5

Total number of generated nodes12

Test Case 4

Please enter the initial Board configuration

2 8 1 3 4 6 7 5 0

Please enter the Goal Board configuration

3 2 1 8 0 4 7 5 6

Please enter the heuristic you wish to apply

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

1

Solution for the above configuration

+++++

+281+

+346+

+750+

+++++

manhattan distance of above board is6

+++++

+281+

+340+

+756+

+++++

manhattan distance of above board is5

+++++

+281+

+304+

+756+

+++++

manhattan distance of above board is4

+++++

+201+

+384+

+756+

+++++

manhattan distance of above board is3

+++++

+021+

+384+

+756+

+++++

manhattan distance of above board is2

+++++

+321+

+084+

+756+

+++++

manhattan distance of above board is1

+++++

+321+

+804+

+756+

+++++

manhattan distance of above board is0

Number of steps it took to reach the solution is7

Total number of generated nodes17

Please enter the initial Board configuration

2 8 1 3 4 6 7 5 0

Please enter the Goal Board configuration

3 2 1 8 0 4 7 5 6

Please enter the heuristic you wish to apply

Please enter 1 for manhattan Distance and 2 for Misplaced Tiles heuristic

2

Solution for the above configuration

+++++

+281+

+346+

+750+

+++++

Misplaced tiles of above board is6

```
+++++
+281+
+340+
+756+
+++++
```
Misplaced tiles of above board is5


```
+++++
+281+
+304+
+756+
+++++
```
Misplaced tiles of above board is3


```
+++++
+281+
+034+
+756+
+++++
```
Misplaced tiles of above board is4


```
+++++
+081+
+234+
+756+
+++++
```
Misplaced tiles of above board is4


```
+++++
+801+
+234+
```

```
+756+

+++++
```

Misplaced tiles of above board is4


```
+++++

+831+

+204+

+756+

+++++
```

Misplaced tiles of above board is3


```
+++++

+831+

+024+

+756+

+++++
```

Misplaced tiles of above board is4


```
+++++

+031+

+824+

+756+

+++++
```

Misplaced tiles of above board is3


```
+++++

+301+

+824+

+756+

+++++
```

Misplaced tiles of above board is2

```
+++++
+321+
+804+
+756+
+++++
```

Misplaced tiles of above board is0

Number of steps it took to reach the solution is11

Total number of generated nodes29

Process finished with exit code 0