

Given the board:

1 0 3

4 2 6

7 5 8

A Star Search when using the Euclidean Distance heuristic, provides the following output:

```
(base) project1$ ./main.out
Welcome to 862208602 8 puzzle solver.
Type "1" to use a default puzzle, or "2" to enter your own puzzle.
2

Enter your puzzle, use a zero to represent the blank
Enter row 1, use space or tabs between numbers
1 0 3
Enter row 2, use space or tabs between numbers
4 2 6
Enter row 3, use space or tabs between numbers
7 5 8

initial state:
1 0 3
4 2 6
7 5 8
goal state:
1 2 3
4 5 6
7 8 0
Enter your choice of algorithm
1 - Uniform Cost Search
2 - A* with the Misplaced Tile heuristic
3 - A* with the Euclidian distance heuristic

3
Expanding state with g(n) = 0, h(n) = 6, and f(n) = 6
1 0 3
4 2 6
7 5 8

Expanding state with g(n) = 1, h(n) = 4, and f(n) = 6
1 2 3
4 0 6
7 5 8

Expanding state with g(n) = 2, h(n) = 2, and f(n) = 6
1 2 3
4 5 6
7 0 8

Goal!!
1 2 3
4 5 6
7 8 0
To solve this problem the search algorithm expanded a total of 3 nodes.
The depth of the goal node: 3.
The maximum number of nodes in the queue at any one time: 8
```

There is also the path to solution:

```
Path of solution to root
```

```
1 0 3
```

```
4 2 6
```

```
7 5 8
```

```
1)
```

```
1 2 3
```

```
4 0 6
```

```
7 5 8
```

```
2)
```

```
1 2 3
```

```
4 5 6
```

```
7 0 8
```

```
3)
```

```
1 2 3
```

```
4 5 6
```

```
7 8 0
```