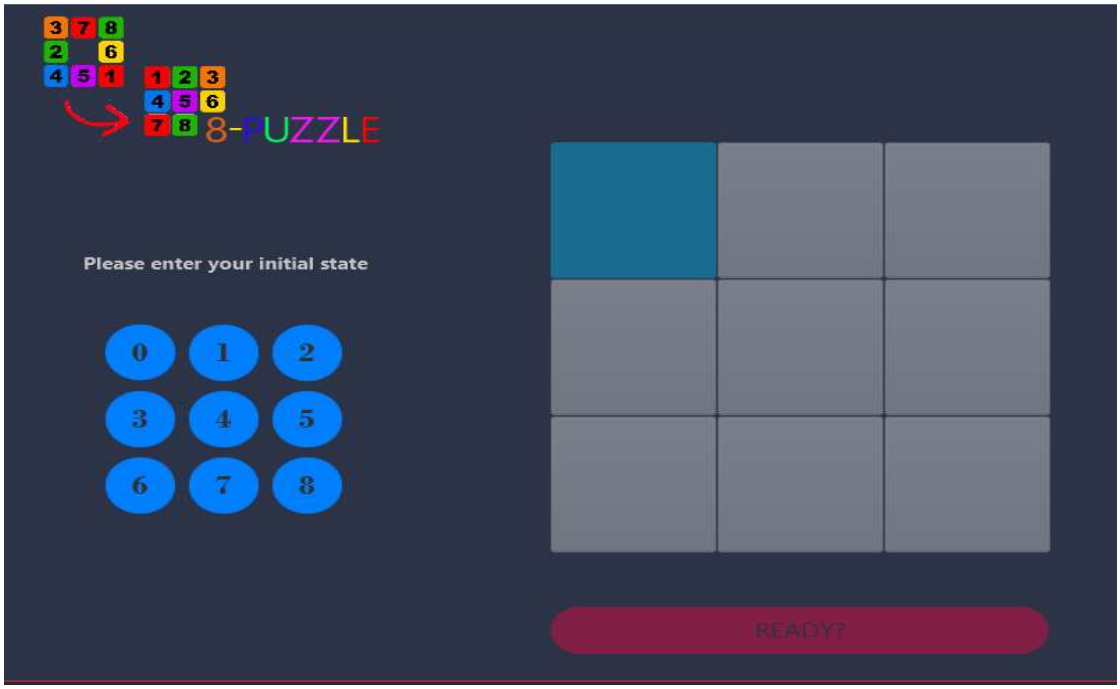
Artificial Intelligence

# 8-PUZZLE SOLVER

Mohamed Hany

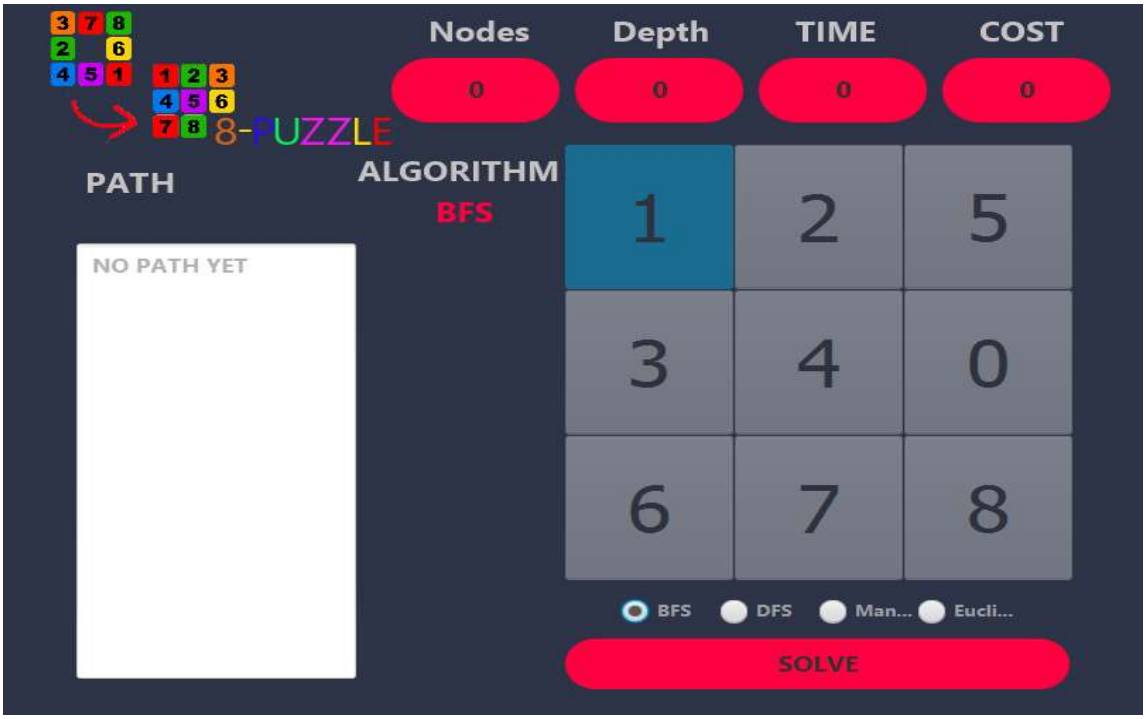
4580

## How to use the app:




After entering the initial state the ready button will be enabled, press it.

It will take you to the second screen:




Choose your algorithm, press solve and let it go. (it may take too long)

## Data Structures:

For the explored nodes: queue.

For the frontier in BFS: queue.

For the frontier in DFS: stack.

For the frontier in A*: priority queue.

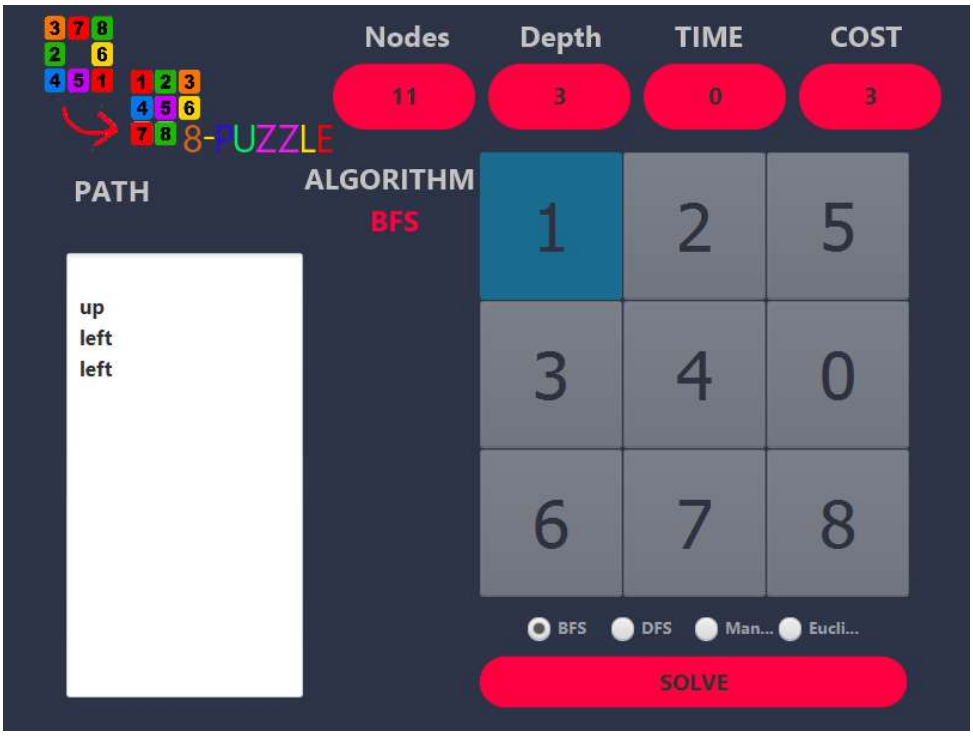
## Assumptions:

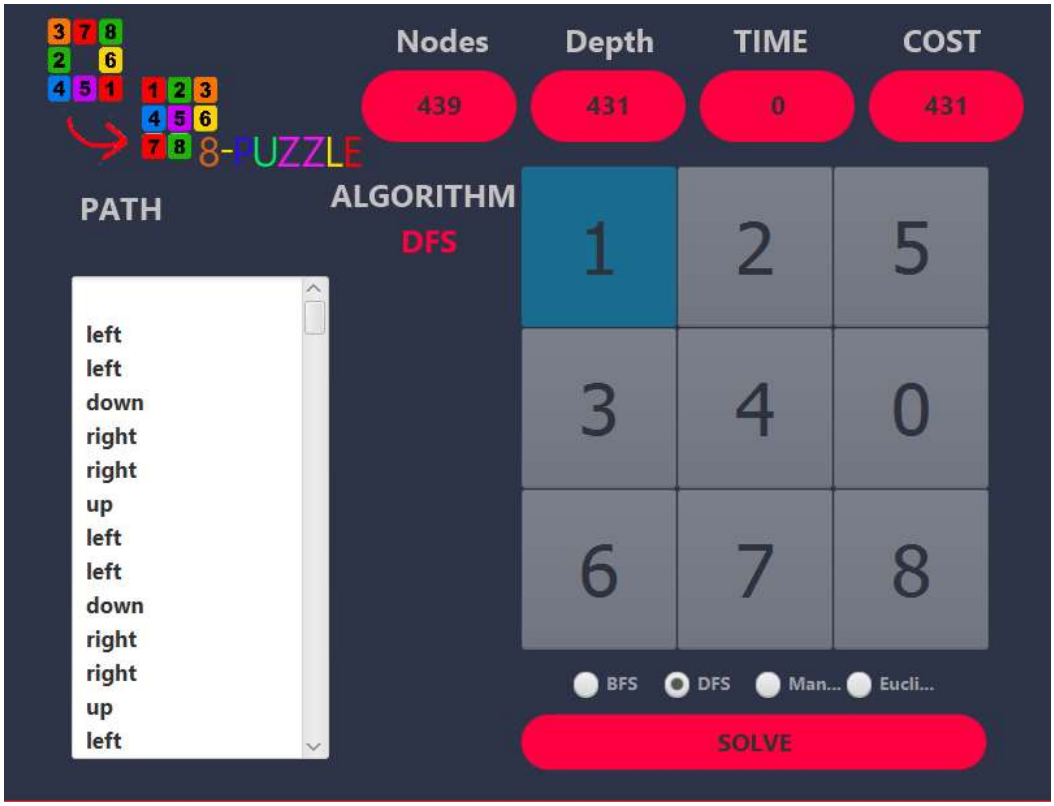
The goal : {0,1,2,3,4,5,6,7,8}

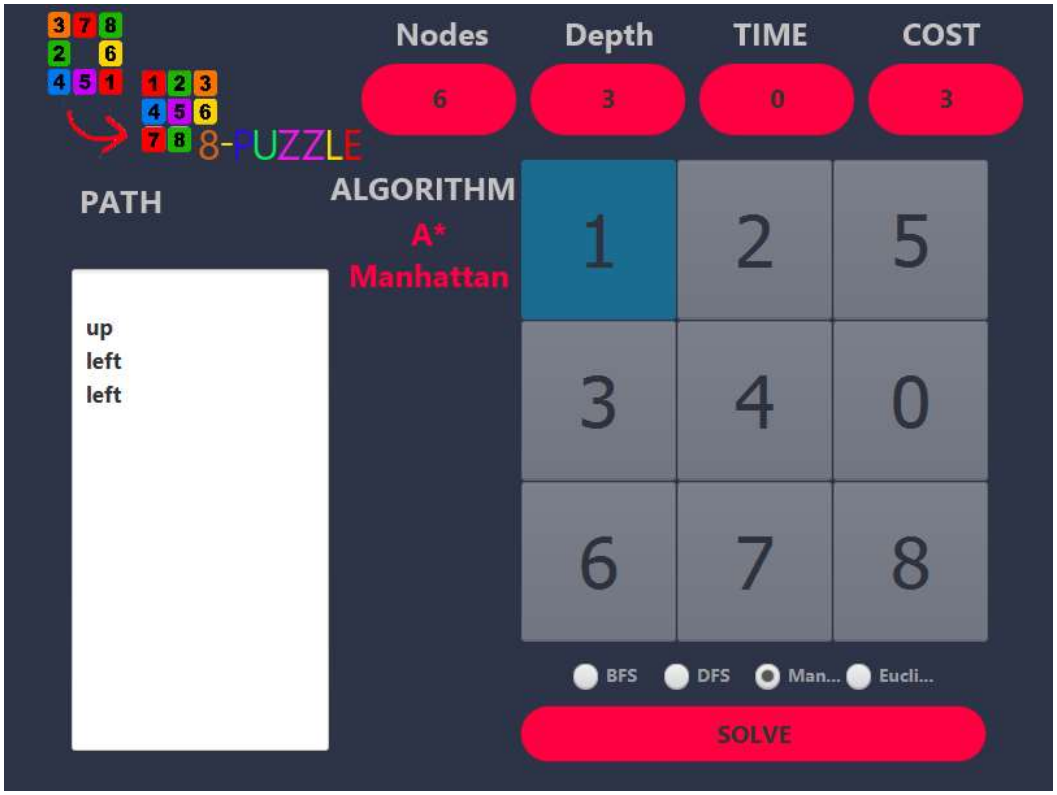
The moves: Up >> Down >> Left >> Right

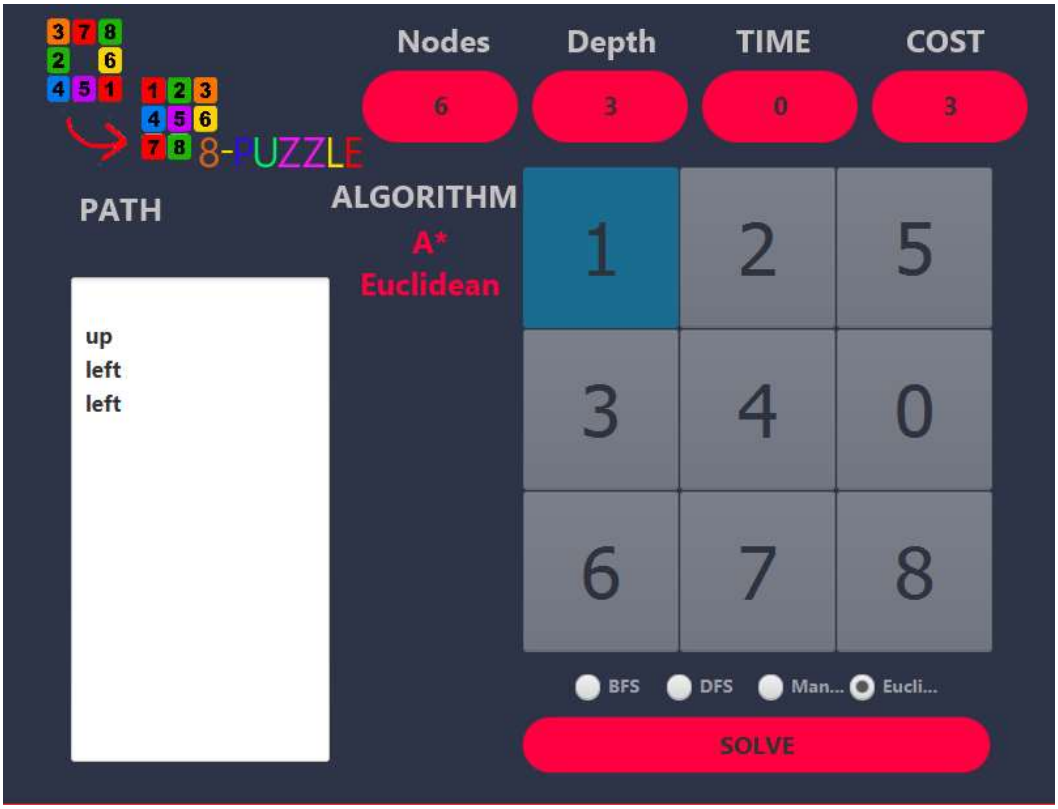
## Sample run:

The initial state : {1,2,5,3,4,0,6,7,8}.




8-PUZZLE
Nodes
Depth
TIME
COST
439
431
0
431
PATH
ALGORITHM
DFS
left
left
down
right
right
up
left
left
down
right
right
up
left
1
2
5
3
4
0
6
7
8
BFS
DFS
Man...
Eucli...
SOLVE


8-PUZZLE
Nodes
Depth
TIME
COST
6
3
0
3
PATH
ALGORITHM
A*
Manhattan
up
left
left
1
2
5
3
4
0
6
7
8
BFS
DFS
Man...
Eucli...
SOLVE




## Conclusion:

Using “Manhattan” as heuristic takes less runtime than “Euclidean” and expands less nodes.