CS661 Artificial Intelligence

Assignment 2: The Eight Puzzle, A Star Search

In this assignment, you are going to write a program that solves the eight puzzle problem. You will solve it using

1) [20 points] A* with the Misplaced Tile heuristic (100 cases in the given file)
2) [20 points] A* with the Manhattan Distance heuristic (100 cases in the given file)

To test your program and analyze the efficiency, you need to test your program on the 100 different input cases. (20 cases for BFS since BFS will take much longer than the others, 100 cases for Iterative deepening depth-first search and the two types of A* searches). The input data is *Input8PuzzleCases.txt*. This file contains a hundred different states of 8-puzzle. All of the given cases are ***solvable***.

For example,

3, 2, 4, 5, 8, 6, 0, 1, 7

means state

3	2	4
5	8	6
0	1	7

You need to find solutions for all 100 different states to the goal state.

The Goal state is

0	1	2
3	4	5
6	7	8

Requirements:

1. The two different A* search must be programmed by you.
2. You are ***required*** to use the given IPython Notebook file to do this assignment.
3. You need to install Anaconda Environment to use the notebook file.
4. You are required to follow the notebook file's requirement to print out results.
5. The searching algorithms must be implemented by you! But you are allowed to use heapq or similar libraries to create the frontier.
6. You need to follow our class to design your program. For example, you can implement frontier queue, heuristic functions, etc.