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Artificial Intelligence Assignment 1 Report

This code is written in Python programming language and used Python 2.7.12 version of it. You can run the code simply executing "python assignment1.py" command line in terminal and interact with simple user interface. This code, generally the A* algorithm section, is pretty much implementation of the pseudocode that in Wikipedia. But, significant changes have been made for the adapting pseudocode to general structure.

Main drawbacks of the project are, in such configurations, it take so long to execute because with iteration, the size of lists of both explored and open increase rapidly and checking a state inside of those lists is a little bit troublesome. Since the number of states go through 20.000 .

The other problem is about Greedy search. If algorithm makes its way to wrong path, it couldn't find any solution despite of initial state is solvable.

Detection for the unsolvable states, total number of inversions is used, if number of inversion is odd, state cannot be solved.

For the statistics, nodes that can produce a stable output is used. I got 10 sample initial states, run them for both 3 algorithms and took w=3 for WA*. In general, Greedy Best-First Search is much more successful for run time by averaging 0,026755238. Next WA* is coming with 0,086819947 and at the last A* resides with 0,165193677 seconds run time.

To compare number of tiles, Greedy algorithm would failed with 65,5 number of moves, A* got 18 average moves and held least total number of moves and WA* has 21,6 in average.