Board Configs:

[1 2 3; 8 0 4; 7 6 5]

[1 2 3; 5 4 6; 0 8 7]

[7 8 5; 4 6 0; 3 2 1]

[1 2 3; 7 8 4; 6 5 0]

2.The results from the functions match my expectations. The functions did what they were supposed to do. When the board was not in goal state, it reported it is not in goal state. When the board was in goal state it reported it was in goal state.

7.The returned solutions do match my expectations. For the return values, if the board configurations are very simple(low heuristic), the depths doesn't matter too much since the solutions are just few steps away. When dealing with high heuristics, using less depth may not be able to find the solution because the solution path might be deeper.

8.

Non-trivial: [7 8 5; 4 6 0; 3 2 1]

BFS:

Table

Description automatically generated

DLS, depth:26

Table

Description automatically generated

DLS, depth 26\*2

Table

Description automatically generated

IDS:

Table

Description automatically generated

Table

Description automatically generatedA\*:

The values met my expectations. First, A\* gave me the shortest path to the solution. DLS using two different depths gave different number of states evaluated and expanded. With fewer depths, the solution could not be found, but with more depth, more states are explored and solutions to the goal state could be found. When using misplaced tile count and Manhattan distance heuristics, A\* didn’t return the shortest solution, it took longer for it to find the solution. When using stupid heuristic, even more states were evaluated using A\*.