

Read Me – Homework 1

The python file “homework1.py” contains the code for solving the 8 puzzle problem using following algorithms:

1. Depth First Search
2. Iterative Deepening Search
3. A Star Search

The Command to run the code:

```
> python <name_of_file> <algorithm_name>
```

Examples:

```
> python homework1.py DEPTH_FIRST_SEARCH
> python homework1.py ITERATIVE_DEEPENING_SEARCH
> python homework1.py A_STAR_SEARCH
```

After this you will be asked to input the initial state of the board.

Enter the state as 3x3, each tile separated by a space and rows separated by new line.

Examples:

```
* 1 2
7 4 3
8 6 5

1 * 3
4 2 5
7 8 6
```

Next, the code shall execute and will output the sequence of moves to reach goal state, total moves and total number of states enqueued to the console.

Assumptions:

- The initial state entered is a Valid configuration
- The Blank tile is denoted by *
- Sequence Order of generating states: Up, Down, Left, Right
- Hence when these states are pushed on stack and retrieved, Right shall pop first
- Duplicates states are not pushed to the stack

Observation:

For the given sequence, A Star gave the best performance in terms of space (states generated) and time(to reach goal), followed by Iterative Deepening and Depth First Search respectively.