CS 411 - Artificial Intelligence I
Fall 2024
Assignment 4
Department of Computer Science, University of Illinois at Chicago

Write a program which performs iterative deepening depth first search (Figure 3.12, AIMA 4th edition) to find the solution to any given board position for 15 puzzle

Input
The input should be given in the form of a sequence of numbered tiles for initial board configuration, '0' indicating the empty space.

Output

1. Moves
2. Number of Nodes expanded
3. Time Taken
4. Memory Used

Submission
Please submit a zip file with filename <netid>_iddfs.zip including following files:

- Source Code
- Readme.txt including the instruction to run the code

Hint

Algorithm 3.12 mentions a function is_cycle(node) to check for cycle in the graph. You can traverse a current node all the way to the root node using pointer to the parent, and keep track of seen node in a hash set. If the current node is same as one its ancestor, then cycle is detected.

Programming Language
You can choose from C++, Java, Python or Julia

Rubric
Implement Iterative deepening depth first search => 10
Print the moves to reach the solution => 3
Print number of nodes expanded => 3
Print total memory usage => 3
Print total time taken => 3
Coding style, comments, readme instruction => 3

NOTE: Due date for Assignment 4 is 09/30/2024 at 9:00am.