

CS 411 - Artificial Intelligence I

Spring 2021

Assignment 6

Department of Computer Science, University of Illinois at Chicago

**Write a program which performs Iterative Deepening a-star (IDA\*) search to find the solution to any given board position for 15 puzzle using two types of heuristics:**

**1. Number of misplaced tiles**

**2. Manhattan Distance**

[https://en.wikipedia.org/wiki/Iterative\\_deepening\\_A\\*](https://en.wikipedia.org/wiki/Iterative_deepening_A*)

#### Input

The input should be given in form of sequence of numbered tiles for initial board configuration, '0' indicating the empty space (see example below)

#### Output

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

#### Submission

Please submit a zip file with filename <netid>\_idastar.zip including following files:

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

#### Programming Language

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

### Rubric

Implement ida\* search with heuristic 'number of misplaced tile' => 6

Implement ida\* search with heuristic 'manhattan distance' => 6

Print the moves to reach the solution => 3

Print number of nodes expanded => 2

Print total memory usage => 2

Print total time taken => 2

Coding style, comments, readme instruction => 4