Author: Anirban Roy

Readme

The 15 Puzzle is solved using A* Algorithms which employs two heuristics:

1. Number of misplaced tiles
2. Sum of the Manhattan Distances of the tiles

The program is written from scratch without using any custom AIMA library. The solution program for A* using both heuristics is written in FifteenPuz_AStar.java file. To compile and run please follow the below steps:

1. Import in Eclipse as Java project and execute.

Program will ask for the initial state of board as input. Input will be tile wise. Thus a state as below:

1	2	3	4
5	6	7	8
9	10	0	12
13	14	11	15

Will have the following input pattern:

```
:::: Enter the initial State::::
Enter value in position [1][1]:1
Enter value in position [1][2]:2
Enter value in position [1][3]:3
Enter value in position [1][4]:4
Enter value in position [2][1]:5
Enter value in position [2][2]:6
Enter value in position [2][3]:7
Enter value in position [2][4]:8
Enter value in position [3][1]:9
Enter value in position [3][2]:10
Enter value in position [3][3]:0
Enter value in position [3][4]:12
Enter value in position [4][1]:13
Enter value in position [4][2]:14
Enter value in position [4][3]:11
Enter value in position [4][4]:15
```

Program displays the number of moves required to solve the puzzle and solution moves. Moves are as follows:

U=Up, D=Down, R=Right and L=Left

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```
Using Number of misplaced tiles Heuristic
================================================================================
        Board                               |  Number of Moves  |   Solution

================================================================================
1 2 3 4 5 6 7 8 9 10 0 12 13 14 11 15           2                 DR

Using Sum of Manhattan Distances Heuristic
================================================================================
        Board                               |  Number of Moves  |   Solution

================================================================================
1 2 3 4 5 6 7 8 9 10 0 12 13 14 11 15           2                 DR
```