A* Search For Column Jump

My solution uses python. Please find the code in <ColumnJump.py>

Input Format:

Size of Board (N)
Number of Colours (C)
<Row1>
<Row2>
..
..
<RowN>

Each State is take as a 2D List of the board state. For Eg.

1 1 2 2
2 1 3 2
3 1 3 2
0 2 3 0

The final goal state consists of all states having just one ball of one colour.

Heuristic Taken -> Number of colours left on the board -1

The Program proceeds as follows :

1. Take board start state from input file.
2. Initialise Priority Queue with this state
3. Proceed to A* Search
4. For each state taken from priority queue, check if goal state is reached :
    a. If YES, proceed to print the path from start->goal state.
    b. if NO, continue with A* search.
5. Neighbours of a state are found by:
    a. Finding locations of all zeros
    b. For each zero, find the possible moves to fill it in the up, down, left and right directions.
    c. For each such move, get the configuration of the next board state.
    d. All the above states will be neighbours of the current state.
6. The Program also stores moves between 2 configurations of the board for printing the moves at the end.
7. Proceed with A* Search by finding f-values of all the board states and adding to priority queue.