UCS and A^* Algorithm for a game

Define the game

In this game, we have several cards with different colors and numbers. We have to sort them According to the following.

Rules of the game

- Ground of the game has k-section
- Each of the card has one of m colors ($m \leq k$)
- Each color has one of n number from 1 to n
- We have to sort cards according to its color and number
- Each of section must have the same color card with descending sort
- At each stage, we can just move one card from a row to another row
- Each card from each row can swap for one card from another row which has greater number than itself.

Example of input

K=5 m=3 n=6
6r 5g 5r 4y
6y 2g 4r 3y 3g 2y
1y 4g 1r
6g 1g 2r 5y 3r
#

Output

6g 5g 4g 3g 2g 1g
6y 5y 4y 3y 2y 1y
6r 5r 4r 3r 2r 1r
# #
OR
6g 5g 4g 3g 2g 1g
5y 5y 4y 3y 2y 1y
#
6r 5r 4r 3r 2r 1r
#