CODECON

Memory Limit: 1024 MB
Time Limit: 5 s

# Tile Adventure (200 points)

## Introduction

You are playing a board game with the following rules.

There is a 2D board of size R x C with different game tiles indicated by uppercase characters A-Z. A player always starts at position (0, 0) and can only move horizontally and vertically. For every iteration, a player must move to another location with a different tile from the current tile (the game will always start with at least 1 different tile the player can move to). If the player can transition to multiple tiles (that is, they have more than one tile to choose from), break the tie in the following order: lexicographically smallest value, then smallest row, and then smallest column value.

Being the crafty coder that you are, you are going to design a simulator that — given a board and a fixed number of iterations K — will print out the path taken until the end of the game (including the starting tile).

## Input Specifications

The first line of the input contains (space-separated): the number of rows $0 < R \leq 5$, the number of columns $0 < C \leq 5$, and the number of iterations $0 < K \leq 10$. This is followed by R lines containing C tiles (representing the game board).

## Output Specifications

Output the tiles in the order they were encountered.

## Sample Input/Output

### Input

```
2 3 3
D C B
C A C
```

### Output

```
DCAC
```

### Explanation

At step 0, player is at tile D (0,0), on step 1 there are two options C at (0,1) and C at (1,0), we will pick C at (0,1) based on the row order. At the end of step 1 we have seen D one time and C one time. On step 2 the best transition is to A at (1,1). Finally on step 3, the best choice is C at (0,1). The final sequence is DCAC.

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### Input

```
3 3 6
Z Z T
```

```
Y Z U
X W V
```

### Output

```
ZYXWVUT
```

### Explanation

At step 0, player is at tile Z (0,0), on step 1 the only valid transition is to Y at (1,0). At the end of step 1 we have seen Z one time and Y one time. On step 2 the best transition is to X at (2,0). Thus, the following sequence of moves follow - ZYXWVUT.

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### Input

```
4 3 8
Z Y Z
Z X W
T X V
S T U
```

### Output

```
ZYXWVUTST
```

### Explanation

We will follow the sequence ZYXWVUTST.

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### Input

```
3 3 10
A A A
C C D
B B B
```

### Output

```
ACACACACACA
```

### Explanation

At step 0, player is at tile A (0,0), on step 1 the only valid transition is to C at (1,0). At the end of step 1 we have seen A one time and C one time. On step 2 there are two valid transitions - back to A at (0,0) and to B at (2,0), and we will pick A as the least valued tile. Thus, the following sequence of moves follow - ACACACACACA.

---

### Input

```
3 3 10
B B B
C A C
B B A
```

### Output

```
BCABABABABA
```

### Explanation

At step 0, player is at tile B (0,0), on step 1 the only valid transition is to C at (1,0). At the end of step 1 we have seen B one time and C one time. On step 2 we have 3 choices - to A at (1,1), to B at (2,0), or back to B at (0,0). We will pick A as the least valued tile. We will then proceed to B at (0,1) and then back to A at (1,1) which starts repeating. Thus, the following sequence of moves follow - BCABABABABA

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### Input

```
3 3 10
Z Y X
Z Z W
T U V
```

### Output

```
ZYXWVUTUTUT
```

### Explanation

This board will follow the sequence ZYXWVUTUTUT