

## 2875 Super-Mazes

A super-maze is a maze where any two cells are guaranteed to be connected by exactly one path, with no entries from or exits to the exterior. Write a program that reads super-mazes, displays them, and finds the path that takes from the upper-left corner to the lower-right.

### Input

The input file consists of various super-mazes to be processed. The definition of each maze begins with a line with two integers  $r$  and  $c$  ( $0 \leq r < 20$ ,  $0 \leq c < 20$ ) that represent the number of rows and columns in the maze, followed by  $r$  lines, each with  $c$  integers whose values are all between zero and three, inclusive. If  $r = 0$  or  $c = 0$ , it means no more mazes.

Each entry in this matrix represents the walls (or openings) of a cell to the right and bottom. An even value (0 and 2) represents a cell with a wall (no opening) to its right, while an odd value (1 and 3), a cell with no wall (an opening) to its right. Similarly, a low value (0 and 1) represents a cell with a wall (no opening) to its bottom, while a high value (2 and 3), a cell with no wall (an opening) to its bottom. Left and top walls (openings) of a cell can be determined by examining values in the corresponding adjacent cells.

Each entry in the input file is guaranteed to represent a super-maze.

### Output

For each maze, display a line with the title 'Super-maze  $k$ :', where  $k$  is a consecutive number starting from 1, followed by a graphical representation for the maze. Then, in the following line(s), the title 'Solution:', followed by one space and a string composed of the characters 'R', 'L', 'U', 'D', (Right, Left, Up, Down) that represents a path for the solution. Put no more than 80 characters per line and leave a blank line between runs (see sample output).

### Sample Input

```

3 3
1 3 2
1 2 0
1 1 0
4 7
2 2 3 0 3 3 2
3 0 3 1 0 0 2
1 3 3 0 3 0 2
1 0 1 1 0 1 0
15 15
3 0 2 3 3 0 2 1 1 2 2 1 1 3 0
2 2 1 2 3 2 1 2 1 1 3 1 1 2 2
3 1 1 2 0 3 3 3 2 2 0 3 0 3 0
3 0 3 2 2 0 0 0 3 1 3 2 1 3 2
0 2 2 3 0 1 1 3 3 0 2 3 0 2 0
2 2 0 0 2 3 1 2 0 2 2 1 1 3 0
2 2 2 3 1 3 0 0 2 1 0 1 2 2 2
1 3 1 2 1 1 0 2 3 1 1 2 3 1 0

```

```

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

```

### Sample Output

Super-maze 1:

```

+---+---+---+
|           |
+---+   +   +
|           |   |
+---+   +---+
|           |
+---+---+---+

```

Solution: RDDR

Super-maze 2:

```

+---+---+---+---+---+---+---+
| | |   |   |   |
+ + + +---+ + + +
| | |   |   |   |
+ +---+ +---+---+---+ +
| |   |   |   |   |
+---+ + +---+ +---+ +
| | |   |   |   |
+---+---+---+---+---+

```

Solution: DRRURRURRDDD

Super-maze 3:

```

+---+---+---+---+---+---+---+---+---+---+---+---+
| | | | | | | | | | | | | | | | | | | | | | |
+ +---+ + + +---+ +---+---+ + +---+---+ +---+
| | |   |   |   |   |   |   |   |   |   |   |
+ + +---+ + + +---+ +---+---+ +---+---+ + +
| |   |   |   |   |   |   |   |   |   |   |
+ +---+---+ +---+ + + + +---+ +---+ +---+
| | | | | | | | | | | | | | | | | | | | | | |
+ +---+ + + +---+---+---+ + +---+ + +---+ +---+
| | | | | | | | | | | | | | | | | | | | | | |
+ + + + +---+ +---+---+ +---+---+---+ + + +
| | | | | | | | | | | | | | | | | | | | | | |

```

```

+---+ +---+ +---+---+---+ + +---+---+ + +---+---+
|      | | |      | | |      | | |      | | |
+---+ +---+ + +---+---+ + + + +---+---+---+ +
| | | | | | | | | | | | | | | |
+ + +---+ + +---+ +---+ + +---+ +---+ +---+
|      | | | | | | | | | | | | | |
+ +---+---+---+---+---+---+ +---+ +---+ + + +---+
| | | | | | | | | | | | | | | |
+ +---+ + +---+ +---+ + + + + +---+---+ +
|      | | | | | | | | | | | | | |
+---+ +---+ +---+ +---+---+ +---+---+ + + +---+
| | | | | | | | | | | | | | | |
+ + +---+---+ + +---+ +---+---+ +---+---+ + +
|      | | | | | | | | | | | | | |
+---+---+---+---+---+---+---+---+---+---+---+---+

```

Solution:

DDRRRUURDRDRRRDDLDLLDLLDDDLDDRDRRRURUURRDRRUURRURRDDRDLDDR