Lab8. BFS

You are trapped in a maze, which consists of unit cubes that may or may not be filled with rocks. You can only move one step up, one step down, one step left, or one step right at a time.
Is it possible to escape? If yes, what is the path to the end?
You need to use BFS to find the shortest path in this maze from a given starting point to a given exit, and do all TODO parts in the template.

Input Format

The first line of the input file means the numbers of mazes.
Each maze description begins with a line containing two integers R and C (both less than 30). R and C are the number of rows and columns.
Then it will follow R lines, each line containing C characters. Each character describes a unit cube of a maze.
A unit cube filled with rock is represented by "#", an empty cell is represented by ".".
The starting point is indicated by "S", and the exit is indicated by the letter "E".

Output Format

If it is possible to reach the exit, please print the entire maze and the path from the starting point to the exit. (Use ‘o’ to represent the path.)
If it is not possible to escape, print “No solution!”.

See more detail from Sample Input and Sample Output.

Sample Input

```
4
10 10
#########
#S.......#
###.#####
###.#####
###.#####
#........#
###.#####
###.#####
#.......E#
#########

7 15
S..............
.#############.
.#E....#######.
.#####.........
.#####.#######.
.#####.#######.
...............

10 15
S..............
...............
...............
...............
...............
...............
...............
...............
.............##
.............#E

10 20
.....#.........#....
.....#.#######.#....
.....#.#.....#.#....
.....#.#.###.#.#....
.....#.#.#S#.#.#....
.....#.#...#.#.#....
.....#.#####.#.#....
.....#.......#.#....
.E...########.#....
.............#.....
```

Sample Output

```
##########
#oooo....#
####o#####
####o#####
####o#####
#...o....#
####o#####
####o#####
#...ooooo#
##########

o..............
o#############.
o#ooooo#######.
o#####o........
o#####o#######.
o#####o#######.
ooooooo........

No solution!

No solution!
```