H. brownies

time limit per test: 4 s.
memory limit per test: 256 MB
input: standard input
output: standard output

Leroy the lion has made a fresh batch of brownies!

Of course, he has cut the brownies, which are on a rectangular tray, into $n * m$ equally-sized pieces ($1 \leq n, m \leq 10^3$), in n rows and m columns. Each brownie needs to be topped with a certain amount of chocolate chips (or none).

However, Leroy wants the number of chocolate chips on each brownie to satisfy some peculiar conditions:

1. Each brownie b must have a strictly greater amount of chocolate chips than at least one neighboring brownie, except if b is topped with no chocolate chips.

2. The number of chocolate chips on each brownie differs from the amount on neighboring brownie by at most one

Leroy has already decided that some (possibly zero) brownies will contain no chocolate chips.

Leroy is curious about how many different amounts of chocolate chips can be placed on each brownie after the above decision has been made (ie: the number of chocolate chips each brownie can take on in all possible valid arrangements).

Please output, in an n by m grid, how many different amounts of chocolate chips can be placed on each brownie.

Input

The first line of input will contain two integers, n and m (the number of rows and columns of brownies in the tray after Leroy has cut the pieces).

The next n lines of input will contain one string with m characters. If Leroy has decided to place no chocolate chips on this brownie, the character will be '0'. Otherwise, it will be an 'X'.

Output

Please output, for n lines, m space separated integers describing how many different amounts of chocolate chips can be placed on each brownie.

Examples

input Copy

```
2 2
0X
X0
```

output Copy

```
1 2
2 1
```

input Copy

```
3 3
000
000
000
```

output Copy

```
1 1 1
1 1 1
1 1 1
```

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Language: GNU G++17 7.3.0

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