Bomb

Problem Description

There is a war happening in the City of Loop. The city is a rectangular grid of cells. Some cells have a building on it, and the other cells are empty.

Several bombs are planted in the city. The bomb will destroy any buildings within radius **R** from where it is planted (i.e. buildings which are within R rows and R columns from the bomb).

Given the locations of the bombs, you are asked to calculate the following:

1. The number of destroyed buildings.
2. The perimeter of the destroyed buildings (see explanation in sample cases below).

Input

The first line contains two integers **M** and **N** (1 <= **M, N** <= 100), the number of rows and columns of the city grid.

The next lines are the city grid of size **M** × **N,** where **X** means that there is a building in that cell, while **O** denotes an empty cell.

The next line contains two integers: **B** (1 <= **B** <= 100), the number of bombs, and **R** (1 <= **R** <= 100), the radius of the bomb's destructive extent.

The next **B** lines contain the coordinates of the bombs (the r-th row and c-th column of the grid).

Output

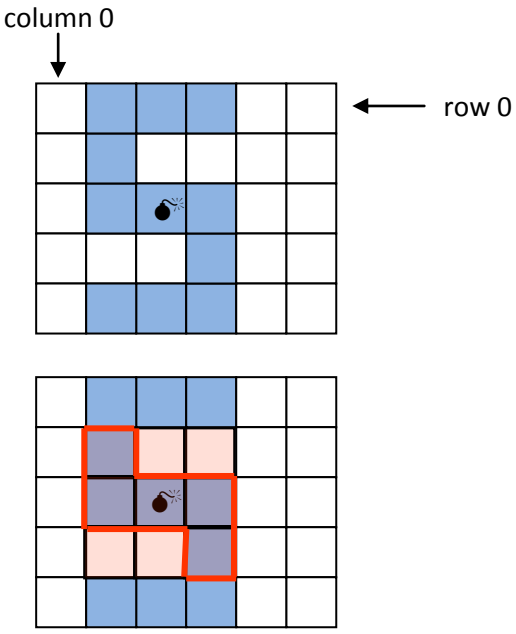
Output the number and perimeter of the destroyed buildings.

Note

The main Java class must be called **Bomb**, and be in the source file **Bomb.java**.

Sample Input 1

```
5 6
O X X X O O
O X O O O O
O X X X O O
O O O X O O
O X X X O O
1 1
2 2
```



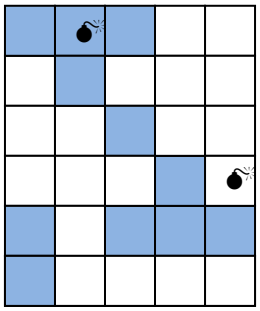
Sample Output 1

```
5 12
```

Explanation 1
Picture above is the city configuration after the bomb in the middle explodes.
(Pinkish grid denotes area hit by the bomb, the perimeter is in red.)

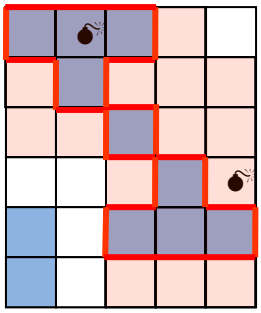
Sample Input 2

```
6 5
X X X O O
O X O O O
O O X O O
O O O X O
X O X X X
X O O O O
2 2
0 1
3 4
```



Sample Output 2

```
9 24
```



Explanation 2
Picture above is the city configuration after the bombs explode.
(Pinkish grid denotes area hit by the bombs, the perimeter is in red.)