Given a rectangular grid of characters you have to find out the length of a side of the largest square such that all the characters of the square are same and the center [intersecting point of the two diagonals] of the square is at location (r, c). The height and width of the grid is M and N respectively. Upper left corner and lower right corner of the grid will be denoted by (0, 0) and $(M-1, N-1)$ respectively. Consider the grid of characters given below. Given the location (1, 2) the length of a side of the largest square is 3.

```
abbbaaaaaa
abbbaaaaaa
abbbaaaaaa
aaaaaaaaaa
aaaaaaaaaa
aaccaaaaaa
aaccaaaaaa
```

Input

The input starts with a line containing a single integer T (< 21). This is followed by T test cases. The first line of each of them will contain three integers M, N and Q (< 21) separated by a space where M, N denotes the dimension of the grid. Next follows M lines each containing N characters. Finally, there will be Q lines each containing two integers r and c. The value of M and N will be at most 100.

Output

For each test case in the input produce $Q + 1$ lines of output. In the first line print the value of M, N and Q in that order separated by single space. In the next Q lines, output the length of a side of the largest square in the corresponding grid for each (r, c) pair in the input.

Sample Input

```
1
7 10 4
abbbaaaaaa
abbbaaaaaa
abbbaaaaaa
aaaaaaaaaa
aaaaaaaaaa
aaccaaaaaa
aaccaaaaaa
1 2
2 4
4 6
5 2
```

Sample Output

```
7 10 4
3
1
5
1
```