B

Block Toy

Input: Standard Input
Output: Standard Output

There is a rectangular board, we want to build a toy by piling some unit blocks onto it. The toy can be described by the following "height matrix", which means we need 4 unit blocks in the middle, and 1 unit block at other positions.

1	1	1
1	4	1
1	1	1

We have an unlimited supply of 1x1 and 1x2 blocks, so we can build the toys in various ways. For example (letters are unit blocks, unit blocks with same letter belongs to the same 1x2 block):

```
AAB
DEB
DCC
```

(a) Top view

```
 E
 E
 F
DCC
```

(b) Front view

If at least one 1x1 blocks is used we say it's a silver toy, otherwise we say it's a gold toy.

Given the height matrix, find out the number of silver toys and gold toys we can build.

Input

There will be at most 20 test cases. Each test case begins with two positive integers R, C (1<=R*C<=16), the number of rows and columns. Each of the following R lines contains C integers h(i,j). (0<=h(i,j)<=20).

Output

For each test case, print the case number, the number of silver toys and the number of gold toys, both modulo 10^9+7.

Sample Input

```
3 3
1 1 1
1 4 1
1 1 1
1 5
1 1 1 1 1
2 2
2 3
4 5
```

Output for Sample Input

```
Case 1: 485 2
Case 2: 8 0
Case 3: 2794 12
```

Problemsetter: Rujia Liu, Special Thanks: Md. Mahbubul Hasan, Shiplu Hawlader