Peking University Student Folk Music Band has a history of more than 90 years. They play Chinese traditional music by Chinese traditional instruments, such as Pipa, Erhu and Guzheng, etc. Doctor Li is a member of that band, and also a former ACMer. Now he is doing some research on Chinese ancient music. Many Chinese ancient music has only five kinds of tones, which can be denoted by 'C','D','E','G', and 'A'. Given a piece of music score, Li wants to do some simple statistics.

Input

There are no more than 20 test cases.

In each test case:

The first line contains two integers n and m ($2 \leq n, m \leq 20$), indicating that a piece of music score is represented by an $n \times m$ matrix of tones. Only 'C','D','E','G', and 'A' can appear in the matrix.

Then the $n \times m$ matrix follows.

The input ends with a line of '0 0'.

Output

For each test case:

For each kind of tone shown in the matrix, calculate the appearing times of it, and print the result in descending order according to the appearing times. If more than one kind of tones has the same appearing times, print them in the lexicographical order.

Sample Input

```
4 5
AGCDE
AGDDE
DDDDD
EEEEE
2 4
GADC
CDEE
0 0
```

Sample Output

```
D 8 E 7 A 2 G 2 C 1
C 2 D 2 E 2 A 1 G 1
```