Dr. Strange's Spell Sorting Problem

Dilhani and JHope are the newly appointed librarians of Kamar-Taj who were given a task to rearrange the dark magic spell collection.
There are n spells in the collection, where the title of each spell is of length m. Dilhani needs the spells to be sorted according to lexicographically ascending order, while JHope wants to sort the spells in lexicographically descending order.

After taking this matter to Dr. Strange, he advised them to combine their ideas and sort it in a way called Dormammu's order.
In Dormammu's order, the odd-indexed characters of the spell titles will be compared descendingly, and the even-indexed characters will be compared ascendingly.

A string a appears before a string b in Dormammu's order, if and only if in the first position where a and b differ, the following holds:

- If the position is even, the string a has a letter that appears earlier in the alphabet than the relevant letter in b;
- If the position is odd, the string a has a letter that appears later in the alphabet than the relevant letter in b.

Input
The first line has two integers, n and m ($1 \le n \cdot m \le 10^6$).

The i-th of the next n lines contains a string s_i that has m uppercase letters — the spell title. The strings are pairwise distinct and indexes start from 0.

Output
Output n integers — the new indices of the strings after they are sorted in Dormammu's order.

Example

Sample Input

```
5 2
AA
AB
BB
BA
AZ
```

Sample Output

```
3 2 4 5 1
```

Cont.

Illustration :

Original Position	Text	Sorted Position
1	AA	3
2	AB	2
3	BB	4
4	BA	5
5	AZ	1