Problem H
Sobriety Test II

Time limit: **3 seconds**
Memory limit: **1024 megabytes**

Problem Description

On another day, Professor Li once again ran into a group of students from our school while strolling through Ximending. He felt that the sobriety test he gave last time was too easy, so this time, he prepared much harder tests for each student.

As before, he gave each student a sobriety test consisting of a large number of questions. Since there were many students again, Professor Li recorded all the test results in his notebook.

Unlike the last time, however, this time Professor Li wants to know how many questions each student answered correctly. Because the tests were significantly long as before, he needs your help to write a program that can efficiently calculate the number of correct answers for each student – the method must be fast enough to meet Professor Li's strict performance standards.

To verify that your solution is efficient enough, Professor Li specifically requires you to use **Binary Search** to find the boundary between '`O`' and '`X`'. During the process, your program must print the mid index for every query made during the binary search.

For example, if a student's test result is "`OOXXXXXXXX`". Initially, the left and right boundaries are 0 and 9, respectively. The first mid index is calculated as $(0 + 9)/2 = 4$, which corresponds to '`X`' in the student's test result. Since it is '`X`', the right boundary is updated to $4-1 = 3$. Now, the new mid index becomes $(0 + 3)/2 = 1$, which is '`O`'. Because it is '`O`', the left boundary moves to $1 + 1 = 2$, making the next mid index $(2 + 3)/2 = 2$. Continue this process until the left boundary crosses the right boundary. At that point, you should know the total number of '`O`'s in the student's test result.

Input Format

Your program should read from standard input. The first line contains a single integer $N(1 \leq N \leq 100)$, the number of students recorded in Professor Li's notebook. Each of the following N lines contains a string representing a student's test result. Each string consists only of the characters '`O`' and '`X`', where all '`O`'s appear before any '`X`'s. The length of each string may be very large (at least 1, up to 10^7 characters).

Output Format

Your program should output $N \times 2$ lines. For each student, print the sequence of mid indices(0-based) used during the binary search, in the order they were queried. Separate each printed mid index with a single space. On the next line, print a single integer - the number of correct answers (i.e., the number of '`O`'s).

Technical Specification

- $1 \leq N \leq 100$
- The length of each string may be very large (at least 1, up to 10^7 characters).

Sample Input 1

```
5
OXXX
OOXXXXXXXX
OOOOOXXXXXXXX
OOXXXXXXXXXXXX
XXXXXXXXXX
```

Sample Output 1

```
1 0
1
4 1 2
2
6 2 4 5
5
7 3 1 2
2
5 2 0
0
```