4255 - Guess

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Given a sequence of integers, $a_1, a_2, ..., a_n$, we define its sign matrix S such that, for $1 \leq i \leq j \leq n$, S_{ij} = `` + '' if $a_i + ... + a_j > 0$ ; $S_{ij}$ = `` - '' if $a_i + ... + a_j < 0$; and S_{ij} = ``0'' otherwise.

For example, if $(a_1, a_2, a_3, a_4) = (-1, 5, -4, 2)$, then its sign matrix S is a 4×4 matrix:

	1	2	3	4
1	-	+	0	+
2		+	+	+
3			-	-
4				+

We say that the sequence (-1, 5, -4, 2) generates the sign matrix. A sign matrix is valid if it can be generated by a sequence of integers.

Given a sequence of integers, it is easy to compute its sign matrix. This problem is about the opposite direction: Given a valid sign matrix, find a sequence of integers that generates the sign matrix. Note that two or more different sequences of integers can generate the same sign matrix. For example, the sequence (-2, 5, -3, 1) generates the same sign matrix as the sequence (-1,5, -4,2).

Write a program that, given a valid sign matrix, can find a sequence of integers that generates the sign matrix. You may assume that every integer in a sequence is between -10 and 10, both inclusive.

Input

Your program is to read from standard input. The input consists of T test cases. The number of test cases T is given in the first line of the input. Each test case consists of two lines. The first line contains an integer n $(1 \leq n \leq 10)$, where n is the length of a sequence of integers. The second line contains a string of $n(n + 1)/2$ characters such that the first n characters correspond to the first row of the sign matrix, the next $n - 1$ characters to the second row, ... , and the last character to the n -th row.

Output

Your program is to write to standard output. For each test case, output exactly one line containing a sequence of n integers which generates the sign matrix. If more than one sequence generates the sign matrix, you may output any one of them. Every integer in the sequence must be between -10 and 10, both inclusive.

Sample Input

```
3
4
-+0++++--+
```

```
2
+++
5
++0+-+-+--+-+--
```

Sample Output

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

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