

Given a sequence of integers,  $a_1, a_2, \dots, a_n$ , we define its *sign matrix*  $S$  such that, for  $1 \leq i \leq j \leq n$ ,  $S_{ij} = "+"$  if  $a_i + \dots + a_j > 0$ ;  $S_{ij} = "-"$  if  $a_i + \dots + a_j < 0$ ; 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  $4 \times 4$  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

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

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
```