# Problem H. Hadamard

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|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 1 second |
| Memory limit: | 256 mebibytes |

*Hadamard matrix* is a square matrix made of $\pm 1$ such that every two rows of it are orthogonal. Two vectors $(a_1, \ldots, a_n)$ and $(b_1, \ldots, b_n)$ are called orthogonal if and only if $a_1 b_1 + \cdots + a_n b_n = 0$. A *canonical Hadamard matrix* of order $k$ is a square matrix of size $2^k$ defined as follows:

$$\begin{cases} A_0 = (1) \\ A_k = \begin{pmatrix} A_{k-1} & A_{k-1} \\ A_{k-1} & -A_{k-1} \end{pmatrix} \end{cases}$$

In your thesis, you study Hadamard matrices with some special properties. You need a beautiful picture of the matrix for the title. You think the matrix is beautiful if its main diagonal is a sequence $x_1, \ldots, x_n$ (more formally, $a_{i,i} = x_i$ for all $1 \leqslant i \leqslant n$, where $x_i = \pm 1$. Of course, matrix should relate to Hadamard matrix someway, so you decided to take a canonical Hadamard matrix and rearrange its rows in a way that it becomes beautiful.

## Input

The first line of input contains one integer $k$ ($0 \leqslant k \leqslant 20$), the order of the matrix. The second line contains a string of length $2^k$ made only of characters "+" and "-": signs of values which should appear on the main diagonal.

## Output

If the solution exists, print $2^k$ distinct integers from 1 to $2^k$. The $i$-th of these integers must be the number of row of the canonical matrix which should be on position $i$.

If there is no solution, print "`Impossible`" (without quotes).

## Example

| standard input | standard output |
|---|---|
| 2<br>+-++ | 3 4 2 1 |