In a k bit 2's complement number, where the bits are indexed from 0 to $k-1$, the weight of the most significant bit (i.e., in position $k-1$), is -2^{k-1}, and the weight of a bit in any position i ($0 \le i < k-1$) is 2^i. For example, a 3 bit number 101 is evaluated as $-2^2 + 0 + 2^0 = -3$ and 011 as $-0 + 2^1 + 2^0 = 3$. A negatively weighted bit is called a **negabit**(such as the most significant bit in a 2's complement number), and a positively weighted bit is called a **posibit**.

A Fun number system is a positional binary number system, where each bit can be either a **negabit**, or a **posibit**. For example consider a 3-bit fun number system Fun3, where bits in positions 0, and 2 are **posibits**, and the bit in position 1 is a **negabit**. $(111)_{Fun3}$ is evaluated as $2^2 - 2^1 + 1 = 3$. Now you are going to have fun with the Fun number systems! You are given the description of a k-bit Fun number system **Funk**, and an integer N (Maybe negative). You should determine the k bits of a representation of N in **Funk**, or report that it is not possible to represent the given N in the given **Funk**. For example, a representation of -1 in the **Fun3** number system (defined above), is 011 (evaluated as $0 - 2^1 + 2^0$), and representing 6 in **Fun3** is impossible.

Input

The first line of the input file contains a single integer t ($0 < t \le 100$), the number of test cases, followed by the input data for each test case.

Each test case is given in three consecutive lines. In the first line there is a positive integer k ($1 \le k \le 64$). In the second line of a test data there is a string of length k, composed only of letters n, and p, describing the Fun number system for that test data, where each $n(p)$ indicates that the bit in that position is a **negabit (posibit)**. The third line of each test data contains an integer N ($-2^{63} \le N < 2^{63}$), the number to be represented in the **Funk** number by your program.

Output

For each test data, you should print one line containing either a k-bit string representing the given number N in the **Funk** number system, or the word '`Impossible`', when it is impossible to represent the given number.

Sample Input

```
2
3
pnp
6
4
ppnn
10
```

Sample Output

```
Impossible
1110
```