Problem C. Suffixes and Palindromes

At a certain algorithm cram school, the students do the following drill each day to prepare for contests:

1. Choose a string of length N made up of lowercase English letters. For example, the string might be `aba`.
2. Find all of the suffixes of the string starting from positions 0, 1, $\cdots$, $N-1$, and sort them in lexicographic order. In our example, the suffixes are `aba`, `ba`, and `a`, and the lexicographically sorted list is `a`, `aba`, `ba`.
3. Go through the sorted list in order, and write down the starting point of each suffix in the original string. In our example, the suffix `a`, which is first in the sorted list, was formed by starting from position 2 in `aba`. The suffix `aba` started from position 0; the suffix `ba` started from position 1. So the students would write down `2 0 1`, in that order.
4. Using the original string, look at every character or every position between two consecutive characters, in order. Try to use each position as the center of a palindrome, and find the length of **longest** palindrome with that center, or 0 if there are none. Then write those numbers down. In our example, the students would first try to use the first a, then the position between the first `a` and first `b`, then the first `b`, then the position between the first `b` and the second `a`, then the second a, and they would write down `1 0 3 0 1`, in that order.

You belong to a rival algorithm school, and you sneaked into this school late at night. You found a student's desk and saw the two lists from steps 3 and 4. Can you figure out what the original string was, and show off by writing it down? If there are multiple choices, use the **lexicographically smallest** one. If there are no choices, the student must have made a mistake, and you should write Wrong calculation!

Input

The first line of the input gives the number of test cases, T, followed by a blank line.

T test cases follow; each consists of three lines followed by one blank line. The first line has N, the length of the string. The next line has N integers: a permutation of the integers from 0 to $N-1$, inclusive, as described in Step 3. The third line has $2 \times N - 1$ integers, as described in Step 4.

Output

For each test case, output one line containing "`Case #x: y`", where `x` is the test case number (starting from 1), and `y` is the lexicographical smallest string that could have produced the two lists. If there is no such string, output "`Wrong calculation!`" instead.

Limits

- $1 \leq T \leq 100$.
- $2 \leq N \leq 10^5$.

- All numbers in the second list will be between 0 and N, inclusive.

Sample input and output

Sample Input	Sample Output
2 3 2 0 1 1 0 3 0 1 3 2 0 1 1 2 3 2 1	Case #1: aba Case #2: Wrong calculation!

Note

Sample case #1 matches the example in the problem statement. Other strings (such as `bcb`) match the two lists, but `aba` is the only acceptable answer because it is lexicographically smallest.

In sample case #2, the palindrome data implies that all of the characters in the original string must be the same, but this doesn't agree with the suffix data. So the student must have made a mistake.