Problem A. A Story

Input file:	standard input
Output file:	standard output
Balloon Color:	Orange

Once upon a time in a world that looks like ours a story of a person who looks like many of us is about to begin and it unravels like a jigsaw puzzle. Make sure to open your eyes and focus, as things can look like a duplicated version of another person's story but soon you will know that it is exceptionally different than any other story you've experienced.

For it being a great harmonic and very imminent journey where paths may cross. Kudos to those who hone their knowledge and leverage their skills as marching into the future would definitely require them.

Esraa is working as an information security engineer. Every employee in her company has a password which is a permutation of N integers.

All the passwords are stored on the main server. To ensure their safety, Esraa created an encryption algorithm and named it EsraaCipher, the algorithm works in the following way:

1. The algorithm appends a 0 to the end of the permutation.
2. It generates all the rotations (left cyclic shifts) of the permutation.
3. It sorts the generated rotations in lexicographical increasing order.
4. The encrypted password is constructed by taking the last integer of every generated rotation after sorting lexicographically.

Here is an example on how the algorithm works: suppose the permutation P is {2, 1}, first a 0 is appended to the end of P so it becomes {2, 1, 0}, now the algorithm will generate all the rotations which are: {2, 1, 0}, {1, 0, 2}, {0, 2, 1}. after sorting the rotations we get: {0, 2, 1}, {1, 0, 2}, {2, 1, 0}. the encrypted password is constructed by taking the last number of every rotation after sorting, so the resulting encrypted password is {1, 2, 0}.

You are hired to try to decrypt and retrieve all the passwords. Can you write a program to decrypt all the T passwords (given the encrypted password, restore the original password)?

Input

The first line of input contains on integer T ($1 \leq T \leq 10^5$), the number of testcases (passwords to decrypt).

The first line of every testcase contains one integer N ($1 \leq N \leq 10^5$), the length of the i_{th} password.

The second line of every testcase contains N+1 integers separated by spaces, which represent the encrypted password.

It's guaranteed that the encrypted password contains distinct integers and any integer x of them in the range [0, N] ($0 \leq \chi \leq N$).

It's also guaranteed that the sum of lengths of all passwords won't exceed 3×10^5

Output

Output T lines, in the i_{th} line output N integers separated by spaces which represent the i_{th} password after decryption. Note that it must be a permutation of size N.

Example

standard input	standard output
3 4 4 0 1 2 3 2 1 2 0 3 2 3 1 0	1 2 3 4 2 1 3 1 2

Note

Lexicographical order is defined in the following way. When we compare permutations s and t, first we find the leftmost position where $s_i \neq t_i$. If there is no such position (i. e. s is a prefix of t or vice versa) the shortest permutation is less. Otherwise, we compare s_i and t_i.

Problem B. Begins and it

Input file:	standard input
Output file:	standard output
Balloon Color:	White

Just like any story, it begins with an ambitious person, Hisham. And as it moves forward, paths start to appear and connect. And as it takes two to Tango, Endure Capital, the ACPC Community Partner, believing in the relentless execution to build and achieve hyper-growth, starts investing in Hisham's future journey.

Hisham has two integer arrays A and B, both of length N. He defines the beautiful shifting operations on arrays X of length N as doing one of two operations:

- Shift all elements to the right, i.e. the new value of X_i is equal to the old value of X_{i-1}, and the new value of X_1 is equal to the old value of X_N.

- Shift all elements to the right, i.e. the new value of X_i is equal to the old value of X_{i-1}, and the new value of X_1 is equal to the old value of X_N.

Hisham calls index I beautiful if B_i divides A_i, i.e. (A_i mod B_i == 0). Also he defines the beauty of the array A as the number of beautiful indices.

You can do the beautiful shifting to either A or B as many times as you want (possibly zero). What is the maximum possible beauty of Array A?

It's guaranteed that the elements of the array B are distinct.

Input

The first line of input contains one integer T ($1 \le T \le 100$), the number of testcases.

The first line of every testcase contains one integer N ($1 \le N \le 10^5$), the length of the arrays A, B.

The second line of every testcase contains N integers separated by spaces, which represent the array A ($1 \le A_i \le 10^5$).

The third line of every testcase contains N integers separated by spaces, which represent the array B ($1 \le B_i \le 10^5$), and all B_i are distinct.

It's guaranteed that the sum of N over all testcases won't exceed 3×10^5.

Output

Output T lines, in the i_{th} line output one integer which represents the maximum possible beauty of arrays A for the i_{th} testcase.

Example

standard input	standard output
4 3 1 2 4 3 2 1 4 3 1 4 1 5 9 2 6 2 1 2 1 2 1 2 4	2 1 2 0