Problem K. Array

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Koishi gives you an integer array B of length n satisfying $1 \le B_1 \le B_2 \le \ldots \le B_n \le n+1$.

Let $S(T)$ denote the set of numbers that appear in array T. Koishi asks you whether an array A of length n exists such that, for any l and r such that $1 \le l \le r \le n$, the equality $S(A[l,r]) = S(A[1,n])$ holds if and only if $r \ge B_l$. If so, please construct an array A that satisfies the condition above.

Here, $A[l,r]$ represents the sub-array of A formed by $A_l, A_{l+1}, \ldots, A_r$.

You can only use integers from 0 to 10^9 in the array. It can be shown that, if a solution exists, then there also exists a solution satisfying this condition.

Notice: If there exists such an index i $(1 \le i \le n)$ that $B_i < i$ holds, the required A must not exist.

Input

The first line contains an integer T $(1 \le T \le 6 \cdot 10^4)$, the number of test cases. Then T test cases follow.

The first line of each test case contains an integer n $(1 \le n \le 2 \cdot 10^5)$, the length of array B (and A).

The next line contains n integers $B_1, B_2, \ldots, B_n$ $(1 \le B_1 \le B_2 \le \ldots \le B_n \le n+1)$, the array that Koishi gives you.

It is guaranteed that $\sum n \le 2.6 \cdot 10^6$.

Output

For each test case, print one line. If such an array A doesn't exist, output -1. Otherwise, you should output n numbers: the array A consisting of integers in the range from 0 to 10^9. If there are several possible solutions, print any one of them.

Example

standard input	standard output
3 4 3 3 5 5 7 4 6 6 7 8 8 8 5 2 3 4 4 6	2 2 1 1 2 3 4 1 3 2 4 -1