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C. Prefix Min and Suffix Max

time limit per test: 2 seconds memory limit per test: 256 megabytes

You are given an array a of **distinct** integers.

In one operation, you may either:

- choose a nonempty $prefix^*$ of a and replace it with its minimum value, or
- choose a nonempty $\mathbf{suffix}^{\dagger}$ of a and replace it with its maximum value.

Note that you may choose the entire array a.

For each element a_i , determine if there exists some sequence of operations to transform a into $[a_i]$; that is, make the array a consist of only one element, which is a_i . Output your answer as a binary string of length n, where the i-th character is 1 if there exists a sequence to transform a into $[a_i]$, and 0 otherwise.

Input

The first line contains an integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains one integer n ($2 \leq n \leq 2 \cdot 10^5$) — the size of the array a

The second line of each test case contains n integers, a_1, a_2, \ldots, a_n ($1 \le a_i \le 10^6$). It is guaranteed that all a_i are distinct.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output a binary string of length n — the i-th character should be 1 if there exists a sequence of operations as described above, and 0 otherwise.

Example

input	Сору
3	
6	
1 3 5 4 7 2	
4	
13 10 12 20	
7	
1 2 3 4 5 6 7	
output	Сору
100011	
1101	
1000001	

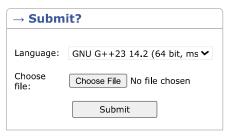
Note

In the first sample, you can first choose the prefix of size 3. Then the array is transformed into



Next, you can choose the suffix of size 2. Then the array is transformed into





→ Last submissions		
Submission	Time	Verdict
326864542	Jul/01/2025 18:04	Accepted
326859982	Jul/01/2025 18:01	Wrong answer on test 2

^{*}A **prefix** of an array is a subarray consisting of the first k elements of the array, for some integer k.

 $^{^\}dagger$ A **suffix** of an array is a subarray consisting of the last k elements of the array, for some integer k.



Finally, you can choose the prefix of size 3. Then the array is transformed into



So we see that it is possible to transform a into [1].

It can be shown that it is impossible to transform a into [3].

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