You are given N counters, initially set to 0, and you have two possible operations on them:

* *increase(X)* − counter X is increased by 1,
* *max counter* − all counters are set to the maximum value of any counter.

A non-empty array A of M integers is given. This array represents consecutive operations:

* if A[K] = X, such that 1 ≤ X ≤ N, then operation K is increase(X),
* if A[K] = N + 1 then operation K is max counter.

For example, given integer N = 5 and array A such that:

A[0] = 3 A[1] = 4 A[2] = 4 A[3] = 6 A[4] = 1 A[5] = 4 A[6] = 4

the values of the counters after each consecutive operation will be:

(0, 0, 1, 0, 0) (0, 0, 1, 1, 0) (0, 0, 1, 2, 0) (2, 2, 2, 2, 2) (3, 2, 2, 2, 2) (3, 2, 2, 3, 2) (3, 2, 2, 4, 2)

The goal is to calculate the value of every counter after all operations.

Write a function:

vector<int> solution(int N, vector<int> &A);

that, given an integer N and a non-empty array A consisting of M integers, returns a sequence of integers representing the values of the counters.

The sequence should be returned as:

* a structure Results (in C), or
* a vector of integers (in C++), or
* a record Results (in Pascal), or
* an array of integers (in any other programming language).

For example, given:

A[0] = 3 A[1] = 4 A[2] = 4 A[3] = 6 A[4] = 1 A[5] = 4 A[6] = 4

the function should return [3, 2, 2, 4, 2], as explained above.

Assume that:

* N and M are integers within the range [1..100,000];
* each element of array A is an integer within the range [1..N + 1].

Complexity:

* expected worst-case time complexity is O(N+M);
* expected worst-case space complexity is O(N) (not counting the storage required for input arguments).