Maximum of minimum \((\text{maxofmin})\)

Given in input a vector \(V\) of \(N\) integers we want to find, for each size between 1 and \(N\), the maximum of the minimum’s of every contiguous subsequence in the vector.

Example

For \(N = 6\) and \(V[6] = [3, 1, 4, 6, 2, 9]\) we have this contiguous subsequences:

- Size 1: \([3], [1], [4], [6], [2]\) and \([9]\).
- Size 2: \([3, 1], [1, 4], [4, 6], [6, 2]\) and \([2, 9]\).
- Size 3: \([3, 1, 4], [1, 4, 6], [4, 6, 2]\) and \([6, 2, 9]\).
- Size 4: \([3, 1, 4, 6], [1, 4, 6, 2]\) and \([4, 6, 2, 9]\).
- Size 5: \([3, 1, 4, 6, 2]\) and \([1, 4, 6, 2, 9]\).
- Size 6: \([3, 1, 4, 6, 2, 9]\).

Where the minimum of each subsequence is bolded.

For each size then the maximum of the minimum’s of every contiguous subsequence in the vector is: \(9\) (for size 1), \(4\) (for size 2), \(2\) (for size 3), \(2\) (for size 4), \(1\) (for size 5) and \(1\) (for size 6).

Implementation

You should submit a single file, with either a .c, .cpp, .java or .py extension.

Your program must read the input data from stdin and write the output data into stdout.

stdin consists of 2 lines:

- Line 1: The integer \(N\), e.g. the size of the vector \(V\).
- Line 2: \(N\) space-separated integers, e.g. the elements of \(V\).

stdout consists of only one line:

- Line 1: \(N\) space-separated integers: the maximum of the minimum’s of every contiguous subsequence in the array, for each size between 1 and \(N\).

No additional output should be printed.

Constraints

- \(3 \leq N \leq 100\,000\).
- \(1 \leq V[i] \leq 1\,000\,000\) for each \(0 \leq i < N\).
Scoring

Your program will be tested on several test cases grouped in subtask. To achieve the score of a subtask, you need to correctly solve all of its test cases.

- **Subtask 1** [20 points]: \( N \leq 100 \).
- **Subtask 2** [20 points]: \( N \leq 1000 \).
- **Subtask 3** [20 points]: \( N \leq 10000 \).
- **Subtask 4** [40 points]: \( N \leq 100000 \).

Examples

<table>
<thead>
<tr>
<th>stdin</th>
<th>stdout</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 3 1 4 6 2 9</td>
<td>9 4 2 2 1 1</td>
</tr>
</tbody>
</table>