**Heap**

|  |  |  |
| --- | --- | --- |
| **Time Limit:** 5000MS |  | **Memory Limit:** 131072K |
|  |  |  |

**Description**

A (binary) heap is an array that can be viewed as a nearly complete binary tree. In this problem, we are talking about max-heaps.

A max-heap holds the property that for each node than the root, it’s key is no greater than its parent’s. Upon this we further require that for every node that has two children, key of any node in the subtree rooted at its left child should be less than that of any node in the subtree rooted at its right child.

Any array can be transformed into a max-heap satisfying the above requirement by modifying some of its keys. Your task is find the minimum number of keys that have to be modified.

**Input**

The input contains a single test case. The test case consists of nonnegative integers distributed on multiple lines. The first integer is the height of the heap. It will be at least 1 and at most 20. Then follow the elements of the array to be transformed into a heap described above, which do not exceed 109. Modified elements should remain integral though not necessarily nonnegative.

**Output**

Output only the minimum number of elements (or keys) that have to be modified.

**Sample Input**

3

1

3 6

1 4 3 8

**Sample Output**

4

**Hint**

1 10  
 / \ / \  
 3 6 =====> 3 9  
/ \ / \ / \ / \  
1 4 3 8 1 2 4 8

**Source**

[POJ Monthly--2007.04.01](http://poj.org/searchproblem?field=source&key=POJ+Monthly--2007.04.01), czh