

Problem 4

Heavy Rainfall

Time limit: 10 second

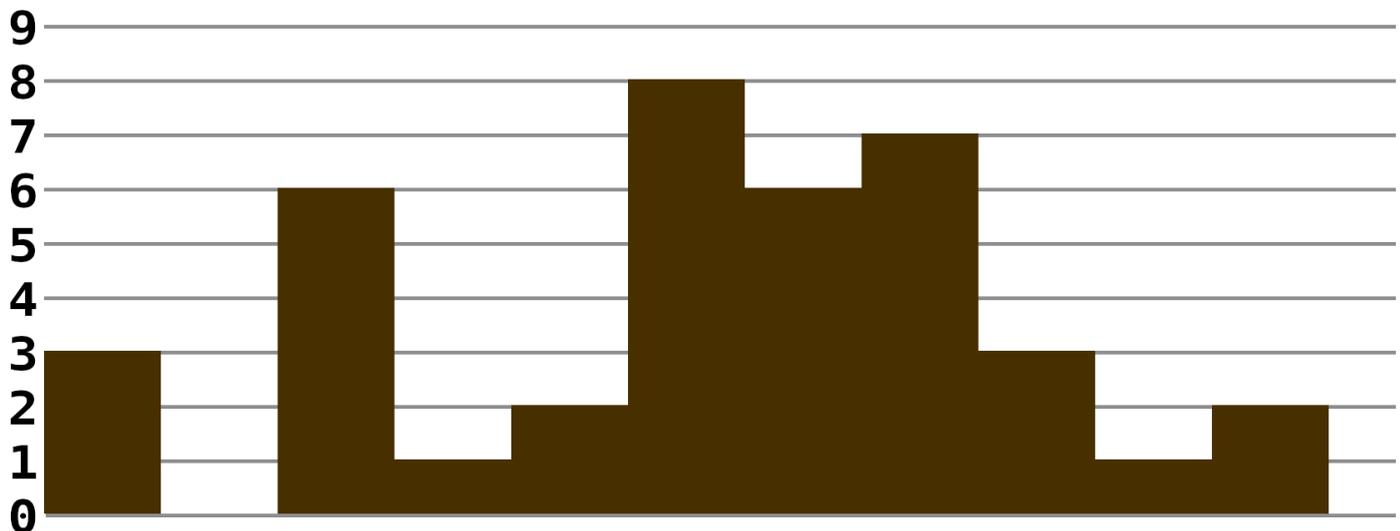
You're taking part in the development of a novel simulation system that is developed to help with extreme rain in mountainous areas. There have been many occasions of extreme weather recently, and there is a need to calculate the amount of water that will form between mountaintops in the worst-case scenario. This program will be used by experts to aid in predicting the outcome of future extreme weather events.

The program will accept a list of heights that result from discrete measurements from the corresponding mountain ranges. A lake can only form if it's surrounded by higher mountains, and its maximum height will be the minimum of the two surrounding mountains. If a height of 0 is given, it represents the ground. A lake cannot form if any of its parts would be connected to the ground; it would quickly drain otherwise. For each lake formed, its size is the number of 'discrete blocks' that it occupies between the mountaintops.

Input:

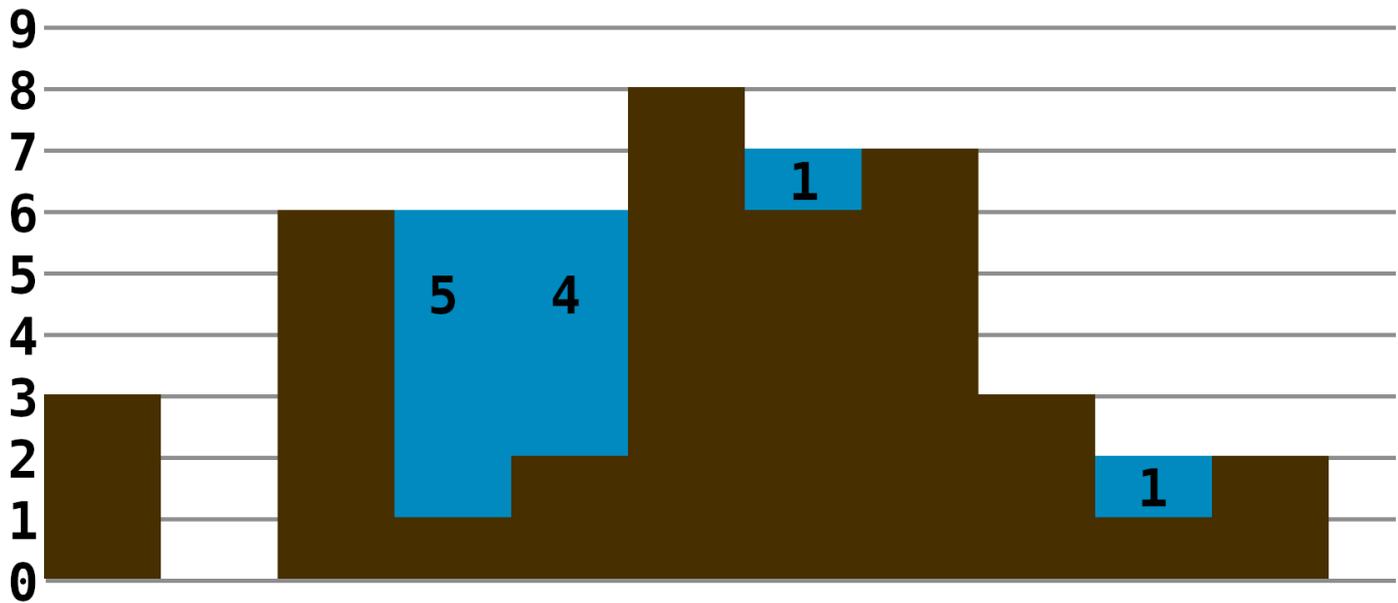
It's easier to understand all of this if we visualize the problem. As an example, consider we're given as input the height values [3, 0, 6, 1, 2, 8, 6, 7, 3, 1, 2]. The mountains formed could be visualized as below:

input: [3, 0, 6, 1, 2, 8, 6, 7, 3, 1, 2]



The biggest lakes that can form for this mountain range and their corresponding sizes would be the following:

input: [3,0,6,1,2,8,6,7,3,1,2]
output: 5 + 4 + 1 + 1 = 11



None of the lakes could be bigger, since the water would fall off either side. Also, a lake cannot form in the first gap, as it drains to the ground.

The first line of the input file contains a single integer N , $0 \leq N \leq 10^5$, and the second a space-separated list of N integers that are the heights of the mountains. Each height value H given is within the range $[0, 10^5]$.

Output:

The output is a single number S (in the range $[0, 10^{10}]$) that is the sum of the maximally sized lakes that can form.

Sample Input 1	Sample Output 1
11 3 0 6 1 2 8 6 7 3 1 2	11
Sample Input 2	Sample Output 2
7 7 5 3 1 3 5 7	18