

Maximum Path Sum

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 100 · problem code: maxpathsum · author: kahootist

Problem Statement

You are given a complete binary tree consisting of n nodes of non-negative integers.
Find the maximum sum of all root-to-leaf paths.

Input

Your first line will contain n .

Your next line will contain n numbers, representing the complete binary tree.

Output

The maximum sum of all root-to-leaf paths.

Constraints

For all test cases:

- $0 \leq n \leq 10^6$
- Each node value, n_i , is restricted between $0 \leq n_i \leq 10^6$.

Example 1

Input

```
3
4 6 5
```

Output

```
10
```

Example 2

Input

```
6
5 3 7 11 4 2
```

Output

```
19
```

Example 3

Input

```
0
```

Output

0

Python Template

```
n = int(input())
tree = list(map(int, input().split()))
```