Problem B. Huffman Coding

Time limit 1000 ms
Memory limit 256MB

Problem Description

Build Huffman's binary prefix tree from symbol frequencies to minimize the total weighted path length

$$\sum_{i=1}^{n} f_i \cdot \ell_i$$

where ℓ_i is the code length (depth) of symbol i. Output the minimum total cost (the value of the sum).

Input format

The first line contains an integer n ($1 \leq n \leq 2 \cdot 10^5$).

The second line contains n positive integers $f_1, f_2, \ldots, f_n$ ($1 \leq f_i \leq 10^9$) — the frequencies of the symbols in input order.

Output format

Print a single integer — the minimum total cost.

Subtask score

Subtask	Score	Additional Constraints
0	0	Sample testcases
1	50	$n \leq 5000$
2	50	No additional constraints

Sample

Sample Input 1

```
3
1 2 3
```

Sample Output 1

```
9
```

Sample Input 2

```
4
5 5 5 5
```

Sample Output 2

```
40
```

Sample Input 3

```
20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
```

Sample Output 3

```
864
```