

D: Regolith Excavation

Standard I/O | Time Limit: 1.0s | Memory Limit: 512MB

Problem Description

A cosmic storm deposited dangerous regolith along an access trench of length n . The trench consists of n tiles numbered 1 to n from left to right, where tile i holds z_i grams of regolith ($1 \leq i \leq n$). Outside the trench are disposal terminals 0 (left) and $n + 1$ (right).

Dr. Aurel has 40 gravitational shovels numbered 0 to 39. Shovel k ($0 \leq k \leq 39$) can transport at most 2^k grams of regolith between adjacent tiles (from i to $i - 1$, or i to $i + 1$) at a cost of $k + 1$ calories.

To coordinate the cleanup, a partition threshold x ($1 \leq x < n$) is chosen:

All regolith at tiles $\leq x$ is moved leftward to terminal 0.

All regolith at tiles $> x$ is moved rightward to terminal $n + 1$.

Solve one of the two sub-problems determined by C :

- If $C = 1$: Given x , calculate the minimum total calories required.
- If $C = 2$: Find the value of x ($1 \leq x < n$) that minimizes the total calories spent. If multiple values achieve the minimum, find the smallest such x .

Input

Line 1: An integer $C \in \{1, 2\}$.

Line 2: An integer n ($2 \leq n \leq 10^5$).

Line 3: n space-separated integers $z_1, z_2, \dots, z_n$ ($1 \leq z_i \leq 10^6$).

Line 4 (present only if $C = 1$): An integer x ($1 \leq x < n$).

Output

Print a single integer: the answer for task C .

Standard Input	Standard Output
1 4 1 3 1 3 2	10