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1 Balanced array

1.1 legend

A *balanced array* is defined as an integer array $a_1, a_2, \ldots a_l$ that satisfies the following condition:

- There exists an integer k, such that $1 \le k \le \frac{l-1}{2}$

- $a_i + a_{i+2k} = 2a_{i+k}$ for each i in $1, 2, \ldots l - 2k$

Given an array $A_1, A_2, \ldots A_n$, the task is to determine whether $A_{1\ldots i}$ is a balanced array for each i in $1, 2, \ldots n$.

To minimize the size of the input file, A_i **was encoded in base-62**, where the characters $0 \ldots 9a \ldots zA \ldots Z$ correspond to the numerical values $1 \ldots 62$ for each digit.

1.2 input

The first line contains an integer n ($1 \le n \le 10^7$), denoting the length of array A.

The second line contains n integers $A_1, A_2 \ldots A_n$ ($1 \le A_i \le 10^9$).

1.3 output

Output a 0/1 string $s_{1\ldots n}$, such that $s_i =$ '1' if $A_{1\ldots i}$ is balanced, $s_i =$ '0' otherwise.