Heap Dijkstra Revisited

Time limit: 0.2s   **Memory limit:** 1G

Richard wants to demonstrate that there are things far worse than Fenwick in terms of things to remember, and the first example he gave was heap Dijkstra.

To demonstrate this, he wants a problem that has many edges, but doesn't benefit too much from fast I/O. So a natural candidate is https://szkopul.edu.pl/problemset/problem/ROXsaseQWYR11jbNvCgM19Er/site/?key=statement.

The algorithm in that problem is basically to construct a graph on the modulus against a_1, and then do shortest path to look for the smallest number in each modulus that could be constructed.

Your job will be to solve this problem with some tuned bounds.

Input Specification

The first line contains a single integer, N.

N lines follow, each containing a single integer a_i.

You may assume $N \leq 100$ and that $1 \leq a_i \leq 2^{40}$.

Furthermore, $a_1 \leq 10^5$.

Output Specification

Let x_i be the smallest value that can be attained that is the sum of some multiset of a_i values that is equivalent to $i \pmod{a_1}$. Print the XOR of all x_i for $0 \leq i < a_1$.

It is guaranteed that x_i is well-defined.

Sample Input

```
6
10
1
11
22
33
478154081019
```

Sample Output

1