

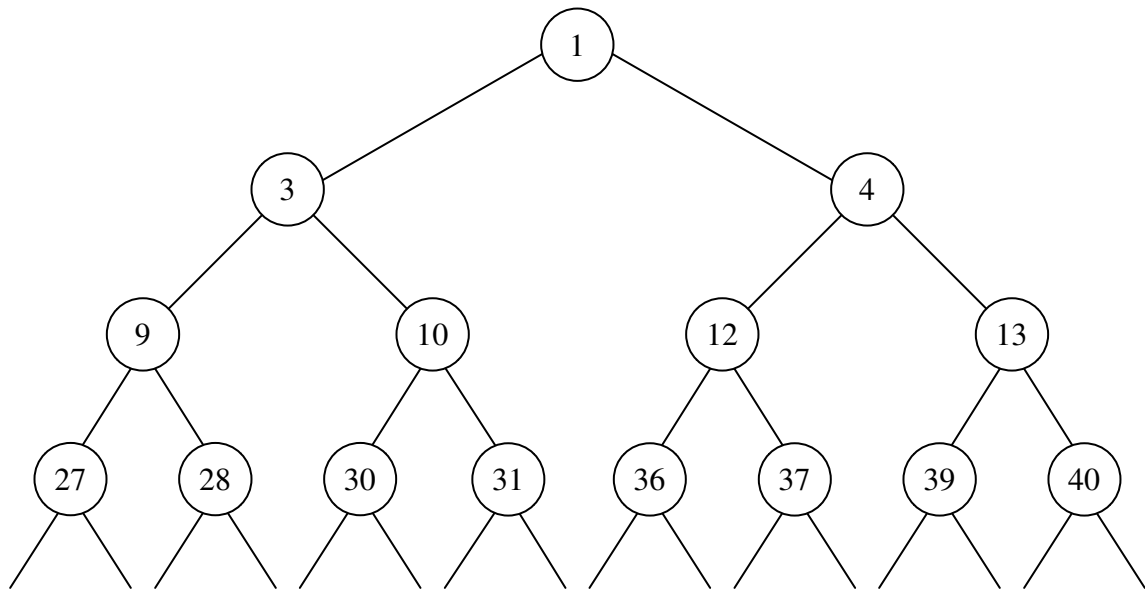
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Task B1. BINARY TREE

Let p be an integer, bigger than 2. Integers are written in the vertices of the infinity binary tree in the following way:

- in the root of the tree it is written 1;
- if in any vertex of the tree it is written x , therefore its left child contains $p \cdot x$ and its right child contains $p \cdot x + 1$.

For example, if $p = 3$, then the beginning of the tree looks in the following way:



A number is called *pretty* if it can be presented in a single way as a sum of two different numbers, which appear in the tree vertices. Write a program **btree**, which determines whether the given numbers n_1, n_2, n_3 and n_4 are *pretty*.

Input

On a single line of the standard input the integers p, n_1, n_2, n_3 and n_4 are given ($2 < p < 50, 0 < n_1 < 10^{18}, 0 < n_2 < 10^{18}, 0 < n_3 < 10^{18}, 0 < n_4 < 10^{18}$).

Output

On a single line of the standard output for every number n_1, n_2, n_3 and n_4 the program must write 1 if the number is *pretty* and 0 if it is not.

Example

Input

3 7 28 13 9

Output

1 1 0 0