

# Problem C. Chef and Queries

Time limit 2000 ms  
Code length Limit 50000 B  
OS Linux

## Problem Statement

You have a set  $S$ , initially empty. You need to process  $Q$  queries on this set, of the following two types:

- Add a number to the set (if this number is *not* already present in the set).
- Erase a number from the set (if this number exists in the set).

Find out the sum of the elements of the set after performing all the queries.

**Note:** In this problem, the time limit is very tight. Using built-in data structures, such as `set/unordered_set` in C++ or `TreeSet/HashSet` in Java, may lead to a Time Limit Exceeded verdict.

## Constraints

- $1 \leq Q \leq 10^7$
- $1 \leq S_1, A, B \leq 10^9$

## Input

The first line of input contains four integers —  $Q, S_1, A, B$ .  $S_1$  is the first number in the operations.  $A$  and  $B$  are special constants explained later.

Every operation  $S_i$  is represented by a single integer. If  $S_i$  is odd, then it represents the first operation, otherwise the second type, and in both of them the integer you have to add/delete equals  $\lfloor \frac{S_i}{2} \rfloor$ .

For  $i > 1$ ,  $S_i = (A \cdot S_{i-1} + B) \bmod 2^{32}$ .

## Output

## Output

Output a single line containing a single integer — sum of elements in the set after  $Q$  queries.

## Sample 1

Input	Output
5 1 1 1	3

**Sample 2**

Input	Output
10000000 77777777 77777777 77777777	5362358669068782

**Note**

The sequence  $\{S_i\}$  is 1, 2, 3, 4, 5:

- Operation 1:  $1 \pmod{2} = 1$ , add number  $\lfloor \frac{1}{2} \rfloor = 0$  to set, sum is 0.
- Operation 2:  $2 \pmod{2} = 0$ , erase number  $\lfloor \frac{2}{2} \rfloor = 1$  from set, 1 is not in set, so nothing happens, sum is 0.
- Operation 3:  $3 \pmod{2} = 1$ , add number  $\lfloor \frac{3}{2} \rfloor = 1$  to set, sum is 1.
- Operation 4:  $4 \pmod{2} = 0$ , erase number  $\lfloor \frac{4}{2} \rfloor = 2$  from set, 2 is not in set, so nothing happens, sum is 1.
- Operation 5:  $5 \pmod{2} = 1$ , add number  $\lfloor \frac{5}{2} \rfloor = 2$  to set, sum is 3.