NOI '17 P1 - Integers

Time limit: 2.0s **Memory limit:** 512M

There is an integer x, initially zero.

There are n operations. Each operation is one of the following types:

- `1 a b`: Add $a \cdot 2^b$ to x where a is an integer (that can be negative) and b is a non-negative integer.
- `2 k`: Write x in binary, and compute the value of the digit corresponding to a weight of 2^k.

It is guaranteed that $x \geq 0$ at any time.

Input Specification

The first line of the input consists of four integers, n, t_1, t_2, t_3.

In the following n lines, each line describes an operation.

Two adjacent elements in a line are separated by exactly one space.

Output Specification

For each type `2 k` query, output a line with an integer (0 or 1) denoting the answer. There shall be no output for each operation of `1 a b`.

Sample Input

```
10 3 1 2
1 100 0
1 2333 0
1 -233 0
2 5
2 7
2 15
1 5 15
2 15
1 -1 12
2 15
```

Sample Output

```
0
1
0
1
0
```

Additional Samples

integer.zip

Constraints

For all test cases, $1 \leq t_1 \leq 3, 1 \leq t_2 \leq 4, 1 \leq t_3 \leq 2$.

Explanation of t_1

- If a test case has $t_1 = 1$, then $a = 1$.
- If a test case has $t_1 = 2$, then $|a| = 1$.
- If a test case has $t_1 = 3$, then $|a| \leq 10^9$.

Explanation of t_2

- If a test case has $t_2 = 1$, then $0 \leq b, k \leq 30$.
- If a test case has $t_2 = 2$, then $0 \leq b, k \leq 100$.
- If a test case has $t_2 = 3$, then $0 \leq b, k \leq n$.
- If a test case has $t_2 = 4$, then $0 \leq b, k \leq 30n$.

Explanation of t_3

- If $t_3 = 1$, then all queries are after updates.
- If $t_3 = 2$, then there are no additional constraints.

Test case	$n \leq$	t_1	t_2	t_3
1	10	3	1	2
2	100		2	
3	$2\,000$			
4	$4\,000$	1	3	
5	$6\,000$	3		1

6	8 000	2		2
7	9 000	3	4	
8	10 000		3	
9	30 000		4	
10	50 000			1
11	60 000		3	2
12	65 000	2	4	
13	70 000	3		
14	200 000			
15	300 000	2		
16	400 000	3		
17	500 000		3	
18	600 000		4	
19	700 000			
20	800 000	1		
21	900 000	2		
22	930 000	3	3	
23	960 000		4	1
24	990 000		3	2
25	1 000 000		4	