

Problem: Hourglasses

Time limit: 2 seconds

Memory limit: 128 MB

Problem Statement

Mr. Panda is doing some cooking and he needs to measure a specific length of time in seconds to make sure his food isn't under-cooked or over-cooked. However, he can't seem to get any timers on hand and he doesn't want to risk dirtying his phone in the kitchen so he decides to use hourglasses.

An hourglass is a mechanical device used to measure time. It consists of two similar bulbs (parts) connected by a narrow neck. It contains some amount of sand, enough to fill one bulb. Initially, all the sand is in the bottom bulb. You can flip an hourglass so that all the sand will be in the upper bulb. Then, the sand will slowly pour into the bottom bulb at constant speed. The same hourglass will always measure the same amount of time.

An hourglass that can measure c seconds can be used to measure any integer multiple of c seconds by flipping it when all the sand reaches the bottom. We shall assume that flipping takes negligible time. However, he can't measure any other value such as $\frac{c}{2}$ because it is difficult to determine when half of the sand has fallen.

This isn't very useful, but with two hourglasses we can do much more. For example, say we have an hourglass that can measure 7 seconds and another that can measure 9 seconds. It is actually possible to measure 11 seconds. Let the two hourglasses be A and B respectively. We can perform the following steps:

1. $t = 0$, we flip A and B
2. $t = 7$, all the sand in A has fallen, we flip A
3. $t = 9$, all the sand in B has fallen, we flip A
4. $t = 11$, all the sand in A has fallen

After time 7, when we flipped A we let it run for 2 seconds before flipping it again, so we know that the sand that has fallen measures exactly 2 seconds.

Mr. Panda doesn't have time to do any preparations of the hourglasses as he is busy cooking so he wants to know the times that can be measured with 2 given hourglasses starting from the initial positions where both hourglasses have all the sand at the bottom. At the end of the measured time, the hourglasses don't need to return to their initial state.

Input

The first line of input contains three integers, A , B and Q , the length of time measured by the first and second hourglass respectively, and the number of queries.

The next line contains Q integers, q_1, q_2, \dots, q_Q which are the times that Mr. Panda wants to measure. The queries are independent of one another.

Output

Output a string of 1's and 0's. The i -th digit is 1 if Mr. Panda can measure the number of seconds in the i -th query.

Subtasks

Subtask	Score	A, B	q_i
1	20	$1 \leq A, B \leq 50$	$1 \leq q_i \leq 10^9$
2	22	$1 \leq A, B \leq 300$	$1 \leq q_i \leq 10^9$
3	27	$1 \leq A, B \leq 2000$	$1 \leq q_i \leq 10^4$
4	31	$1 \leq A, B \leq 2000$	$1 \leq q_i \leq 10^9$

For all test cases, $1 \leq Q \leq 10^4$

Sample Input 1

```
7 9 20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
```

Sample Output 1

```
00000010101011111111
```

Sample Explanation

Although Mr. Panda can measure 2 seconds, it requires preparation work and cannot be measured from the initial state when both hourglasses have all the sand at the bottom. However, he can measure any time more than 13 seconds.

Sample Input 2

```
50 36 13
98 99 100 102 104 106 108 110 112 114 116 118 120
```

Sample Output 2

```
0010011001101
```