Try to learn properly

Most of the programmers like the problem description to be as short as possible, right? I also never like the problem description to be so narrative.

In this problem, you will be given an array *a* of n integers. If we multiply all the numbers of the array then we will get a result. Suppose the result is *K*.

let's introduce another list of all the common multiples of an array as *cmp*. Definitely, the list has an infinite number of elements.

Suppose, we have an array $a = \{2, 3, 6\}$. The result of multiplication of 2, 3 and 6 is 36. So $K = 36$.

The 1st common multiple of *a* is 6, the 2nd common multiple is 12, 3rd is 18, and so on.

So the list, *cmp* = {6, 12, 18, 24, 30, 36, 42, ... }.

Now the question is what the position of *K in the cmp list*? (1-based indexing)

As the result can be very big, you have to print K % 1000000009($10^9 + 9$), where % is modulo operator.

Note: In the above-described example, the position of *K* is 6. ($cmp_6 = K = 36$).

Input

The first line of the input will be *n*, the number of elements in the array.

In the next line, *n* elements of the array $a_1, a_2, a_3 ... a_n$ *will be given.*

Constraints

- $0 < n \le 10^5$
- $0 < a_i \le 10^9 (1 \le i \le n)$

Output

Print a single integer, the result of the problem described above with a new line.

Example

Input:
3
6 10 8

Output:
4