Problem A. A + B

Input file:	aplusb.in
Output file:	aplusb.out
Time limit:	8 seconds
Memory limit:	512 mebibytes

Andrew is studying in the seventh grade. The class has recently learned about periodic decimals, so Andrew is very curious how to work with them.

Recall that a periodic decimal is the way to represent rational numbers by specifying the preperiod and the period of its infinite decimal representation. For example, $1/7 = 0.(142857)$, $1/12 = 0.08(3)$.

There are some numbers that have two representations as periodic decimals, those that are actually finite decimals such as $0.(9) = 1.(0)$. In this problem such numbers must be represented as ending with zeroes, so $0.(9)$ is an incorrect periodic decimal for the purpose of this problem.

Now Andrew wants to add two numbers given as periodic decimals. The sum of two periodic decimals is always again a periodic decimal, but the length of the period can be quite big. Therefore Andrew only asks you to find some particular digits of the sum. You have to output digits at positions $a_1, a_2, \ldots, a_n$.

To simplify the task, Andrew only wants to add numbers of the form $0.(\alpha)$ where α is a period.

Input

The input file contains multiple test cases. The first line of the input file contains t — the number of tests in the input file.

The first two lines of each test case contain periods of the two numbers to add, the periods contain digits from 0 to 9. The length of each period is at most 100 000. The following line contains n — the number of queries, the line with n integers a_i follows ($1 \le n \le 300\,000$, $1 \le a_i \le 10^{18}$).

The total length of periods of all numbers in the input file doesn't exceed 200 000. The sum of n in the input file doesn't exceed 300 000.

Output

For each a_i in the test case print a digits that is at the a_i-th position after the decimal point in the sum of two periodic decimals specified in the input. Positions are numbered from 1.

Do not separate digits by spaces. Print answer for each test case on a separate line.

Example

aplusb.in	aplusb.out
2 142857 3 10 1 2 3 4 5 6 7 8 9 10 4 5 3 1 2 3	4761904761 000

In the first example $0.(142857) = 1/7$, $0.(3) = 1/3$, $1/7 + 1/3 = 0.4761904761904761\ldots$

In the second example $0.(4) = 4/9$, $0.(5) = 5/9$, $4/9 + 5/9 = 1.00000000\ldots$