Cheerio Contest 2 P3 - Digits

Time limit: 1.0s **Memory limit:** 256M

Farmer Bob has two numbers A and B, which can be represented as a string of X 9s and a string of Y 9s respectively. He wants to find out the product of A and B (which he will call P). Bob soon realizes that P will be *extremely* big, so he will ask Q questions about P instead. For the i^{th} question, he wants to know the value of the q_i^{th} digit in P when counting from the left. Can you write a program to help him?

Constraints

For all subtasks:

- $1 \leq Q \leq 5 \times 10^5$
- q_i will not exceed the number of digits in P.
- $1 \leq X, Y \leq 10^{18}$

Points Awarded	Additional Constraints
2 points	$1 \leq X, Y \leq 9$
6 points	$X = 1$ and $1 \leq Y \leq 10^{18}$
7 points	No further constraints

Input Specification

The first line contains three integers X, Y and Q.

The next Q lines contain an integer q_i.

Output Specification

Output Q lines, with the i^{th} line containing the answer to the i^{th} question.

Sample Input

```
3 4 2
1
5
```

Sample Output

```
9
0
```

Explanation for Sample

Since $A = 999$ and $B = 9\,999$, $P = 999 \times 9\,999 = 9\,989\,001$.