

# Problem H. Array Repetition

**Time Limit** 4000 ms

**Mem Limit** 262144 kB

Jayden has an array  $a$  which is initially empty. There are  $n$  operations of two types he must perform in the given order.

1. Jayden appends an integer  $x$  ( $1 \leq x \leq n$ ) to the end of array  $a$ .
2. Jayden appends  $x$  copies of array  $a$  to the end of array  $a$ . In other words, array  $a$  becomes  $[a, \underbrace{a, \dots, a}_x]$ . It is guaranteed that he has done at least one operation of the first type before this.

Jayden has  $q$  queries. For each query, you must tell him the  $k$ -th element of array  $a$ . The elements of the array are numbered from 1.

## Input

Each test consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 5000$ ) — the number of test cases. The description of the test cases follows.

The first line of each test case contains two integers  $n$  and  $q$  ( $1 \leq n, q \leq 10^5$ ) — the number of operations and the number of queries.

The following  $n$  lines describe the operations. Each line contains two integers  $b$  and  $x$  ( $b \in \{1, 2\}$ ), where  $b$  denotes the type of operation. If  $b = 1$ , then  $x$  ( $1 \leq x \leq n$ ) is the integer Jayden appends to the end of the array. If  $b = 2$ , then  $x$  ( $1 \leq x \leq 10^9$ ) is the number of copies Jayden appends to the end of the array.

The next line of each test case contains  $q$  integers  $k_1, k_2, \dots, k_q$  ( $1 \leq k_i \leq \min(10^{18}, c)$ ), which denote the queries, where  $c$  is the size of the array after finishing all  $n$  operations.

It is guaranteed that the sum of  $n$  and the sum of  $q$  over all test cases does not exceed  $10^5$ .

## Output

For each test case, output  $q$  integers — answers to Jayden's queries.

## Examples

Input	Output
<pre> 4 5 10 1 1 1 2 2 1 1 3 2 3 1 2 3 4 5 6 14 15 16 20 10 10 1 3 1 8 2 15 1 6 1 9 1 1 2 6 1 1 2 12 2 10 32752 25178 3198 3199 2460 2461 31450 33260 9016 4996 12 5 1 6 1 11 2 392130334 1 4 2 744811750 1 10 1 5 2 209373780 2 178928984 1 3 2 658326464 2 1000000000 914576963034536490 640707385283752918 636773368365261971 584126563607944922 10000000000000000000 2 2 1 1 1 2 1 2 </pre>	<pre> 1 2 1 2 3 1 2 3 1 3 9 8 1 3 1 3 6 3 8 8 11 11 11 10 11 1 2 </pre>

## Note

In the first test case:

- After the first operation  $a = [1]$ ;
- After the second operation  $a = [1, 2]$ ;
- After the third operation  $a = [1, 2, 1, 2]$ ;
- After the fourth operation  $a = [1, 2, 1, 2, 3]$ ;
- After the fifth operation  $a = [1, 2, 1, 2, 3, 1, 2, 1, 2, 3, 1, 2, 1, 2, 3]$ .

In the fourth test case, after all operations  $a = [1, 2]$ .