

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
4	1 2 1 2 3 1 2 3 1 3
5 10	9 8 1 3 1 3 6 3 8 8
1 1	11 11 11 10 11
1 2	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	

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 $a = [1, 2, 1, 2, 3, 1, 2, 1, 2, 3, 1, 2, 1, 2, 3, 1, 2, 1, 2, 3]$.

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