Problem C. Mathematical Calculation

Time limit 1000 ms
Memory limit 256MB

Problem Description

You are given an integer x, initially equal to 1.

You must process Q operations. There are two kinds of operations:

- Operation type 1: **1 val**. Replace x by $x \cdot val$, then output $x \bmod M$.
- Operation type 2: **2 pos**. Let v be the value used in the operation of type **1 val** at position pos. Replace x by x/v, then output $x \bmod M$.

All operations are numbered from 1 to Q in the order they are given in the input.

It is guaranteed that:

- For every operation **2 pos**, the operation at position pos is of type **1 val**.
- Each operation of type **1 val** is referenced by at most one later operation of type **2 pos**.
- Every division is exact, i.e. at the moment of applying operation **2 pos**, the current value of x is divisible by v.

Your task is to output the value of $x \bmod M$ after each operation.

Input format

The first line contains two integers Q and M ($1 \le Q \le 10^5$, $1 < M \le 10^9$).

Each of the next Q lines describes one operation:

- **1 val**: multiply the current x by val ($1 \le val \le 10^9$);
- **2 pos**: divide the current x by the value used in the operation of type **1 val** at position pos ($1 \le pos \le Q$).

All operations satisfy the guarantees described above.

Output format

For each operation, print a single line containing the value of $x \bmod M$ after performing this operation.

Subtask score

Subtask	Score	Additional Constraints
0	0	Sample testcases
1	20	$Q \le 5000$
2	25	M is a prime number, and in every operation of type **1 val** we have $val \not\equiv 0 \pmod M$.
3	55	No additional constraints

Sample

Sample Input 1

```
10 1000000000
1 2
1 3
1 5
2 2
1 4
1 1000000000
2 3
1 7
2 6
1 9
```

Sample Output 1

```
2
6
30
10
40
0
0
0
56
504
```

Sample Input 2

```
10 11
1 2
1 3
2 1
1 5
1 7
2 4
1 9
1 10
2 2
2 7
```

Sample Output 2

```
2
6
3
4
6
10
2
9
3
4
```