D. Power Tree

Genos and Saitama went shopping for Christmas trees. However, a different type of tree caught their attention, the exalted Power Tree.

A Power Tree starts out as a single root vertex indexed 1. A Power Tree grows through a magical phenomenon known as an *update*. In an *update*, a single vertex is added to the tree as a child of some other vertex.

Every vertex in the tree (the root and all the added vertices) has some value v_i associated with it. The *power* of a vertex is defined as the strength of the multiset composed of the value associated with this vertex (v_i) and the *powers* of its direct children. The *strength* of a multiset is defined as the sum of all elements in the **multiset** multiplied by the number of elements in it. Or in other words for some **multiset** S:

Saitama knows the *updates* that will be performed on the tree, so he decided to test Genos by asking him queries about the tree during its growth cycle.

An update is of the form $1\ p\ v$, and adds a new vertex with value v as a child of vertex p.

A query is of the form $2\ u$, and asks for the power of vertex u.

Please help Genos respond to these queries modulo $10^9 + 7$.

Input
The first line of the input contains two space separated integers v_1 and q ($1 \leq v_1 < 10^9$, $1 \leq q \leq 200\,000$) — the value of vertex 1 and the total number of updates and queries respectively.

The next q lines contain the updates and queries. Each of them has one of the following forms:

- $1\ p_i\ v_i$, if these line describes an update. The index of the added vertex is equal to the smallest positive integer not yet used as an index in the tree. It is guaranteed that p_i is some already existing vertex and $1 \leq v_i < 10^9$.
- $2\ u_i$, if these line describes a query. It is guaranteed u_i will exist in the tree.

It is guaranteed that the input will contain at least one query.

Output
For each query, print out the power of the given vertex modulo $10^9 + 7$.

Examples

input
```
2 5
1 1 3
1 2 5
1 3 7
1 4 11
2 1
```

output
```
344
```

input
```
5 5
1 1 4
1 2 3
```

```
2 2
1 2 7
2 1
```

output

```
14
94
```

Note

For the first sample case, after all the updates the graph will have vertices labelled in the following manner: 1 — 2 — 3 — 4 — 5

These vertices will have corresponding values: 2 — 3 — 5 — 7 — 11

And corresponding powers: 344 — 170 — 82 — 36 — 11