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F. Forced Online Queries Problem

time limit per test: 5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given an undirected graph with n vertices numbered from 1 to n. Initially there are no edges.

You are asked to perform some queries on the graph. Let $last$ be the answer to the latest query of the second type, it is set to 0 before the first such query. Then the queries are the following:

- $1\ x\ y\ (1 \le x, y \le n, x \ne y)$ — add an undirected edge between the vertices $(x + last - 1) \bmod n + 1$ and $(y + last - 1) \bmod n + 1$ if it doesn't exist yet, otherwise remove it;
- $2\ x\ y\ (1 \le x, y \le n, x \ne y)$ — check if there exists a path between the vertices $(x + last - 1) \bmod n + 1$ and $(y + last - 1) \bmod n + 1$, which goes only through currently existing edges, and set $last$ to 1 if so and 0 otherwise.

Good luck!

Input

The first line contains two integer numbers n and m $(2 \le n, m \le 2 \cdot 10^5)$ — the number of vertices and the number of queries, respectively.

Each of the following m lines contains a query of one of two aforementioned types. It is guaranteed that there is at least one query of the second type.

Output

Print a string, consisting of characters '0' and '1'. The i-th character should be the answer to the i-th query of the second type. Therefore the length of the string should be equal to the number of queries of the second type.

Examples

input
```
5 9
1 1 2
1 1 3
2 3 2
1 2 4
2 3 4
1 2 4
2 3 4
1 1 3
2 4 3
```

output
```
1010
```

input
```
3 9
1 1 2
1 2 3
1 3 1
2 1 3
1 3 2
2 2 3
1 1 2
2 1 2
2 1 2
```

output
```
1101
```

→ **Virtual participation**

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest]

→ **Practice**

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ **Clone Contest to Mashup**

You can clone this contest to a mashup.

[Clone Contest]

→ **Submit?**

Language: GNU G++11 5.1.0 ▼

Choose file: 选择文件   未选择任何文件

[Submit]

→ **Problem tags**

data structures   divide and conquer   dsu
graphs   trees   *2800

No tag edit access

→ **Contest materials**

- Announcement #1 (en)   ✕
- Announcement #2 (ru)   ✕
- Tutorial #1 (en)   ✕
- Tutorial #2 (ru)   ✕

Note

The converted queries in the first example are:

- 1 1 2
- 1 1 3
- 2 3 2
- 1 3 5
- 2 4 5
- 1 2 4
- 2 3 4
- 1 2 4
- 2 5 4

The converted queries in the second example are:

- 1 1 2
- 1 2 3
- 1 3 1
- 2 1 3
- 1 1 3
- 2 3 1
- 1 2 3
- 2 2 3
- 2 1 2