

Problem 5 - Waston and Abili (100 pts)

Problem Description

Waston and Abili runs a consulting detective service. In a recent case, a train storage station of British Railway drew their attention. They suspect that the operator of the station hid something illegal in the train storage station by manipulating the records. To check if there is any mismatch with the official record, they sneaked into the station and have only one night to find out which train cabin is not recorded.

As their friend and one who has extreme self-confidence in programming, you want to write a program that reads in the parking logs and print out a map of the storage station. The log begins with two integers, k , n , denoting the mount of parking rails and the records in the log respectively.

There are three types of logs in the official record.

1. Cabin with label l enters the r -th rail

In this station, **each parking rail has only one entrance, which is also the exit**, so only the last cabin that entered the rail can leave the rail. If a cabin with label l entered the r -th parking rail, the corresponding log will be `enter r l`

2. The last cabin stored in the r -th rail leaves that rail

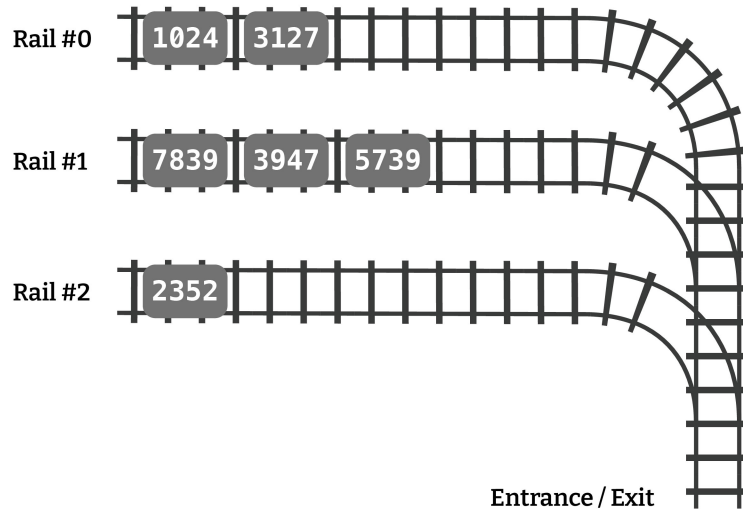
If the last cabin of r -th rail leaves the station, the corresponding log will be `leave r`

3. The r_a -th rail is shut down for maintenance, all the cabins is migrated to the r_b -th rail one by one.

Sometimes, the operator shutdowns certain rails for railway maintenance. In such scenario, all cabins of the maintenance rail leaves and enters another one by one. If the r_a -th rail is shut down, and all its cabins is migrated into the r_b -th cabin, then the corresponding log will be `migrate r_a r_b`

There might be some mistakes in the logs, for example, a cabin leaving from an empty rail. In such case, just ignore all the illegal logs. After processing all logs, please output what the cabin arrangement should be like in the station from the 0-th rail to $(n - 1)$ -th rail.

Below is an illustration of a station with 3 rails and 6 cabins.



Input Format

The first line contains two integer k, n . The next n lines may be in below three formats:

1. `enter` follow by two integer r, l
2. `leave` follow by one integer r
3. `migrate` follow by two integer r_a, r_b

Output Format

You should output k lines, each containing the labels of train cabins parked in each rail by the order they entered the rail. For example, the i -th line contains the labels of cabins parked in rail i .

Constraint

1. $1 \leq n \leq 10^6$
2. $2 \leq k \leq 10^3$
3. $0 \leq r, r_a, r_b < n, r_a \neq r_b$
4. $0 \leq l \leq 10^4$, noted that l is not necessarily identical

Subtasks

Subtask 1 (25 pts)

- $1 \leq n \leq 10^3$
- $1 \leq k \leq 10$
- No migrate operation

Subtask 2 (50 pts)

- $1 \leq n \leq 10^4$
- $10 \leq k$

Subtask 3 (25 pts)

- No \oplus ther constraints!
- You might want to search for “how to reverse a linked list in less than $O(n)$ time” to solve this problem
- GL & HF :P

Sample Cases

Sample Input 1

```
3 7
enter 1 1
enter 1 2
enter 2 3
enter 2 4
enter 2 5
leave 2
migrate 2 1
```

Sample Output 1

```
1 2 4 3
```

Note that there are two empty lines , one above and the other below 1 2 4 3. For more sample cases, go to the problem page on DSA Judge.