Supply Planner

Time limit: 1 sec

You are the owner of one big company that produces very expensive consumer product. There are **N** manufacturing plants and **M** stores that your company operates. These plants and stores are labeled 1..N and 1..M, respectively. You are to plan a distribution of product from the plants to the stores for a period of **K** days.

For each day, exactly one event will occur. The event is either A) production of 1 unit of the product by one plant or B) request for 1 unit of the product by one store. Your task is to response to each of these event. For A), you have to decide to sent the product to one of the stores, or to keep it in the stock of the plant in case that no store need the product. For B), you have to decide to get the product from one of the plant, or to do nothing and wait for the product because no plant has any stock right now.

The appropriate action of each event can be described by the following rules. For A), if any store is waiting for a product, you have to send it to the one that has waited for the longest time. However, if no store is waiting for the product, you have keep the product in the stock. For B), you have to get the product from the plants that has a stock that has been manufactured earliest. However, if no plants has the stock right now, you have to wait.

You have to decide the correct action for each event. Let us assume that the first day is called day 1 and the last day is called day K.

Input

- The first line of input contains three integers **N, M and K.** ($1 \le N,M \le 10,000$; $1 \le K \le 200,000$)
- The following K lines give the event for each day, starting from the first day to the last day. Each line contains three integers **D**, **E** and **L**. D indicates the number of the day. The integer E indicates the type of the event where 0 means events A) while 1 means event B). The integer L indicates the label of the respective plant or store. ($1 \le D \le K$; $1 \le L \le \max(M,N)$)
    - It is guaranteed that the value of D is distinct. The value of L will never exceed N when E is 0 and will never exceed M when E is 1.

Output

The output must have exactly K lines that describes the action for each day, **starting from day 1 to day K.** Each line contains one integer. For event A), you must give the label of the store that the product is sent to, or the value 0 if the product is stored in the stock of the plant. For event B), you must give the label of the plant that the store get the product from, or the value 0 if the store cannot get a product from any plant.

Example

Input	Output	
2 2 3 3 1 2 1 0 2 2 0 1	0 0 2	*//day 1, plant 2 produce and keep* *//day 2, plant 1 produce and keep* *//day 3, store 2 request and get from plant 2*
3 3 7 5 0 3 1 1 1 3 1 1 2 1 2 4 0 3 7 0 3 6 1 1	0 0 0 1 2 0 1	*//day 1, store 1 request and wait* *//day 2, store 2 request and wait* *//day 3, store 1 request and wait* *//day 4, plant 3 produce and sent to 1* *//day 5, plant 3 produce and sent to 2* *//day 6, store 1 request and wait* *//day 7, plant 3 produce and sent to 1*