Auction

Time limit: 1 sec

We are writing a program to simulate result of an auction of multiple items. There are **N** different types of items. Each type of item is labeled by a number 1 to N. There are K_i pieces of the ith type of the items. **M** users, labeled 1 to M are auctioning for these items. A user can auction for multiple type of items but each user may receive at most 1 piece for each type of item. For the ith type of item, the K_i highest bidders will get the item. If there are less than K_i users bid for that item type, only that many piece of items will be given out to the auctioning users. Moreover, if two or more users bid with equal price, the user with *higher* label won the bid.

We receive the list of the actions of these users, given in chronological order. A user can either bid for an item or withdraw his/her earlier auction. If a user put a a new bid for an item that he/she has already bidden, the new bid override the earlier bidding. We would like to know the list of item type that are won by each user.

Remark: for CU CP student, this problem resemble the auctioning system of our approved elective class.

Input

- The first line contains the three integers **N, M, A** (1 <= N, M, A <= 1,000,000)
- The following lines contain N integers describing the number of each item type starting from item type 1 to item type N. Each item has at most 10 piece.
- The following A lines describes the actions of these users, one action per line.
  - Each line start by either a letter B or a letter W where B means bidding and W means withdrawal
  - If the first letter is B, there will be three more following integers **U**, **I** and **V**. The first integer U is the label of the user, the second number I indicates the label of the item and the last integer V indicates the bidding value. The bidding value is a positive integer not exceeding 1000.
  - If the first letter is W, there will be two more following integers **U** and **I**. The first integer U is the label of the user, the second number I indicates the label of the item that that user would like to withdraw the auction. It is possible that a user mistakenly withdraw auction that he/she's never bidden.

Output

The output contains M lines, each line described the item won by each user starting from the first user to the last user. For the ith lines, display the numbering of the item the ith users won, ordered by the numbering value. If that user does not won any item, display the word "NONE".

Example

Input	Output
2 3 4 1 1 B 1 1 10 B 2 1 100 B 1 2 99 B 2 2 100	NONE 1 2 //user 2 bids higher than user 1 on both items
2 3 5 1 1 B 1 1 10 B 2 1 100 B 1 2 99 B 2 2 100 B 2 2 98	2 1 //the last action by user 2 override his earlier action
2 3 2 1 1 B 1 1 100 B 2 1 100	NONE 1 // user 2 won the bid because he has higher label
2 3 5 1 1 B 1 1 10 B 2 1 100 W 1 1 B 2 2 100 B 2 2 98	NONE 1 2 // user 1 withdraw his bidding
2 3 3 2 1 B 1 1 10 B 2 1 100 B 2 2 1	1 1 2 //all items are auctioned