

Problem A

Advanced Recommendation System

You are working on a new recommender system for an important marketplace company which sells N different items with integer identifiers from 1 to N .

What the recommender system does is predict the preference a user would give to an item based on a list of other items he already bought. The system is used to predict what item j a user would most likely react after having reacted to a product i . If the recommender system finds evidence that the user reacts to a product j after reacting to the product i , then the preference of j over i increases by 1 which means the system will more likely recommend j to users that have previously reacted to i .

The marketplace found this recommender system is working quite well, however, they identified that sometimes given the product i the system recommends a product j which is not the product with more preference over i , this is, there is another product k that has been reacted more times after reacting to product i than product j . They want you to make a change so that the product that is recommended for product i is the one with the most preference among the products users have reacted after reacting to i . They are also interested to answer if there are more than one of such items, and to find among all pairs of items (i, j) what pair is the one where the preference j over i is maximum in the system, in case such pair exists. Note that the preference for j over i is not necessarily the same as preference for i over j .

Input

The first line of input contains two integer numbers separated by a space, N and Q ($1 \leq N, Q \leq 2 \times 10^5$) representing the number of items in the marketplace and the number of queries that will be performed to test your system. Each of the next Q lines describe a query to your system, being one of the following:

- R i j : The system registered evidence that someone reacted to the product j after i .
- Q i : Answer the query, what is the product j that should be recommended.
- B: Answer the query, what is the pair i, j where the preference for j over i is the maximum.

Output

For each query 'Q' answer a line with the id j of the product that should be recommended, if there are multiple products that could be recommended print the string "Multiple", if the system does not have enough information to answer print "No info". For each query 'B' answer a line with two numbers separated by a space representing the values for i and j where the preference for j over i is the maximum, if there are more than one such pairs print "Multiple". The queries should be answered in the same order they appear in the input

Input example 1	Output example 1
5 13 R 1 2 Q 1 Q 4 R 2 3 R 3 2 R 2 3 Q 2 B R 1 4 R 1 5 R 1 4 R 1 2 Q 1	2 No info 3 2 3 Multiple