

Bookshelf Tracking

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 512 megabytes

Professor E.D. Pryanik, the head of the department of programming history and philosophy (PHP), is absolutely convinced that only a student who has thoroughly studied all n volumes of his fundamental work “The Science of Programming” can write a term paper under his guidance. Student should study all books, and only then E.D. Pryanik conducts the interview with him. If the professor is satisfied with the results, he assigns a topic for the term paper to the student.

Professor wants you to help track the order of books on the bookshelf in his office. The bookshelf contains n books numbered with integers from 1 to n . It is guaranteed that n is an even number. The bookshelf can be represented as a permutation of integers from 1 to n — the order of books on the bookshelf.

There are two operations that can happen with the bookshelf:

- Professor swaps two books on the bookshelf.
- A new student comes to the office to read all n books.

He reads books in order from 1 to n :

- n times the student takes the next book. An empty space remains in the position of the book.
- If the number of books to the left of the empty space is smaller than the number of books to the right of the empty space, he moves all the books on the left of the empty space one position to the right. Otherwise, he moves all books on the right of the empty space one position to the left. As a result, the empty space goes to the first, or to the last position.
- The student returns the book to the empty space.

Given the initial order of books on the bookshelf and the sequence of operations. Tell the professor the final order of books after applying all operations.

Input

The first line contains two integers n, q ($2 \leq n, q \leq 3 \cdot 10^5$). It is guaranteed that n is an even number.

The second line contains a permutation of numbers from 1 to n — the initial order of books on the bookshelf.

Each of the following q lines contains a description of the next operation. Each line starts with the symbol “E” or “R” describing the type of the operation.

- If the symbol is “E” the line contains two integers i, j ($1 \leq i, j \leq n, i \neq j$) — the indices of books that should be swapped (book numbers, not positions in the permutation).
- If the symbol is “R” the student comes to the office to read all books.

Output

Print n numbers — the final order of books on the bookshelf.

Example

standard input	standard output
8 4	7 1 3 6 2 4 5 8
7 2 6 1 8 3 5 4	
R	
E 2 3	
R	
E 1 6	