Array and simple queries



Given two numbers N and M. N indicates the number of elements in the array A[](1-indexed) and M indicates number of queries. You need to perform two types of queries on the array A[].

You are given M queries. Queries can be of two types, type ${\bf 1}$ and type ${\bf 2}$.

- Type 1 queries are represented as 1 i j: Modify the given array by removing elements from i to j and adding them to the front.
- Type 2 queries are represented as $\frac{2}{i}$ $\frac{i}{j}$: Modify the given array by removing elements from i to j and adding them to the back.

Your task is to simply print |A[1] - A[N]| of the resulting array after the execution of M queries followed by the resulting array.

Note While adding at back or front the order of elements is preserved.

Input Format

First line consists of two space-separated integers, N and M.

Second line contains N integers, which represent the elements of the array.

M queries follow. Each line contains a query of either $\it type 1$ or $\it type 2$ in the form $\it type i j$

Constraints

```
1 \le N, M \le 10^5 \ 1 \le A[i] \le 10^9 \ 1 \le i \le j \le N
```

Output Format

Print the absolute value i.e. abs(A[1]-A[N]) in the first line.

Print elements of the resulting array in the second line. Each element should be seperated by a single space.

Sample Input

```
8 4
1 2 3 4 5 6 7 8
1 2 4
2 3 5
1 4 7
2 1 4
```

Sample Output

```
1
2 3 6 5 7 8 4 1
```

Explanation

Given array is $\{1, 2, 3, 4, 5, 6, 7, 8\}$.

After execution of query 124, the array becomes $\{2, 3, 4, 1, 5, 6, 7, 8\}$.

After execution of query $2\ 3\ 5$, the array becomes $\{2,3,6,7,8,4,1,5\}$.

After execution of query 1 4 7, the array becomes $\{7,8,4,1,2,3,6,5\}$. After execution of query 2 1 4, the array becomes $\{2,3,6,5,7,8,4,1\}$. Now |A[1]-A[N]| is |(2-1)| i.e. 1 and the array is 23657841