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 **1** and type **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 `2 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 *type 1* or *type 2* in the form $type\ i\ j$

Constraints
$1 \leq N, M \leq 10^5$
$1 \leq A[i] \leq 10^9$
$1 \leq i \leq j \leq N$

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 $1\ 2\ 4$, 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