DSA Lab 1 | Set 1 | **Sorted Array and Queries**

Given a sorted array of integers (in increasing order) and its maximum capacity, implement the following operations:

- **Insert:** The specified element should be inserted such that the array remains sorted. The insertion operation should display the number of elements in the array after insertion and the number of shift operations required to perform this insertion. **NOTE:** Assume the element specified to be inserted does not exist in the array already. The value should not be inserted if the array exceeds its capacity. In this case, the number of shift operations would be 0 and the number of elements in array won't change
- **Delete:** The specified element should be deleted. **NOTE:** Assume the element specified to be deleted already exists in the array. The deletion operation should display the number of elements in the array after deletion and the number of shift operations required to perform this deletion.
- **Display:** Prints elements in the array, separated by single space. For an empty array, print a blank line.

Input

First line contains 3 space separated integers $MAXN$ $(1 \leq MAXN \leq 100)$, n $(1 \leq n \leq MAXN)$, and q $(1 \leq q \leq 1000)$ – the maximum capacity of the array, initial number of elements, and the number of queries that will be asked. For all elements $a[i]$, $0 \leq a[i] \leq 10000$

The second line contains n space separated integers – the initially sorted array.

Next q lines contain queries of the form:

- 1 x – Insert x in the array
- 2 x – Remove x from the array
- 3 – Display the current array

Note: See sample for clarification.

Output

- For every 'Insert' operation, display two integers(single space-separated) representing the number of elements in the array after insertion and the number of shift operations required to perform the insertion, respectively.
- For every 'Delete' operation, display two integers(single space-separated) representing the number of elements in the array after deletion and the number of shift operations required to perform the deletion.
- For every 'Display' operation, print elements in the array, separated by single space. For an empty array, print a blank line

Sample Case
Input:

```
6 3 5
4 8 11
1 7
3
1 6
2 8
3
```

Output:

4 2
4 7 8 11
5 3
4 1
4 6 7 11

Explanation:

Initially the array is 4,8,1 1.

On insertion of 7, values 8 and 1 1 are required to be moved towards right by o ne position each, resulting in 2 shift operations.

On insertion of 6, values 7, 8 and 1 1 are required to be moved towards right b y one position each, resulting in 3 shift operations.

On deletion of 8, value 1 1 needs to be shifted left by 1 position, hence one shi ft operation required.