Fuchsia's Array

Fuchsia paws some numbers of an N sized array A to the ground. Being a very curious cat she wants to restore the order of the array by placing the scattered numbers on the ground to their original place. Let B be the set which contains the numbers that are not scattered to the ground by her paw and let I be the set which contains the original indices of these numbers from the array A. Fuchsia knows the array S which has a size of M and contains the sum of every k-sized subarrays of array A. An element S_i in the array S can be shown as in the following formula where $1 \leq i \leq M$:

$$S_i = \sum_{j=i}^{i+k-1} A_j$$

Fuchsia also notices the following property of array I:

$$P = \{x \mid i \in I \ \textit{and} \ 0 \leq x \leq k-1, \ x = i \pmod{k}\}$$
$$|P| = k - 1$$

Fuchsia wants your help to restore the numbers in her array A.

Input Format

First line contains three space separated integer: N, M and k.
Second line contains the array S.
Following $k-1$ lines contain the numbers that Fuchsia didn't paw to the ground and each line contains two space separated integers I_i, B_i which denotes the index, number.

Constraints

$1 < k < 10^3$
$1 < N < 10^6$
$1 \leq M < N$
$-10^6 \leq A_i \leq 10^6$
$1 \leq S_i \leq 10^3$
All arrays are 1-indexed.

Output Format

Print the restored version of array A with separating each number by a whitespace.

Sample Input

10 8 3
3 4 7 9 12 16 21 27
9 8
5 4

Sample Output

1 1 1 2 4 3 5 8 8 11

Explanation

If we try to partition the array to k parts we will have something like this:

. . . | . 4 . | . . 8 | .

The numbers in the 5th and 9th index are not scattered by Fuchsia's paw. Resulting array will look like this:

1 1 1 2 4 3 5 8 8 11

Note that this array holds the formula described in the problem statement.