

Youtube

N students are bored in computer class so they watch funny video clips on YouTube.

The site contains K popular clips, numbered 1 through N. When a video clip is watched, a list of similar video clips is displayed on the side.

Every student picks a video clip from the main page and starts watching it. After exactly one minute every student gets bored of his or her video clip, so he opens the **first** video clip from the list of similar clips on the side (even if he already watched that clip).

Write a program that determines for each student which video clip he will be watching **during the M-th minute** of the class.

Input

The first line contains three integers N, K and M ($1 \leq N, K \leq 100\,000$) ($1 < M \leq 1\,000\,000\,000$), the numbers of students, video clips and minutes.

The second line contains N integers, each between 1 and K, the indices of video clips the students start watching.

The third line contains K integers, each between 1 and K, the index of the first similar clip for each video clip.

Output

Output N integers, the indices of video clips that students will be watching during the M-th minute.

Example

Input:

```
4 5 2
1 2 4 3
5 5 1 2 3
```

Output:

```
5 5 2 1
```

Input:

```
2 6 5
1 6
2 3 4 1 4 5
```

Output:

```
1 2
```